NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III

ORAL EXAMINATION COMPONENT

Prepared by:

Westat, Inc.
1650 Research Boulevard
Rockville, MD 20850

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1. OVERVIEW OF THE NHANES III

1.1 Introduction and Purpose of the Survey

The Third National Health and Nutrition Examination Survey (NHANES III) is being conducted by the National Center for Health Statistics (NCHS) of the United States Public Health Service. Data collection began in September 1988 and will continue for approximately 6 years (two 3-year rounds) at 88 locations across the U.S. The main survey was preceded by three pretests which were held between September 1987 and March 1988 in Los Angeles, California, Washington, D.C. and Tampa, Florida. Another pretest called the "Dress Rehearsal" was conducted in October 1988, just prior to the start of the main survey.

Approximately 40,000 individuals two months of age and older will be randomly selected from households across the U.S. to participate in the survey. Selected persons will be invited to take part in the survey by completing interviews in their homes and by receiving examinations at the Mobile Examination Center (MEC). The detailed interview includes demographic, socioeconomic, dietary, and health-related questions. Upon completion of the interview, respondents will be asked to voluntarily participate in additional interviews, extensive physical and dental examinations and biochemical tests, all conducted by highly trained medical personnel in a mobile examination center (MEC).

The purpose of NHANES III is to assess the health and nutritional status of adults and children in the United States. NCHS will use the data collected in this survey to define the normative distribution of:

- Specifically-defined diseases and other conditions of ill health;
- Nutritional disorders;
- Potential risk factors; and
- Normative health-related measurements, such as height, weight, and blood pressure.

At the conclusion of the study, prevalence rates will be computed for blacks, Mexican-Americans, Puerto Ricans, and other groups including whites, by age, sex, and income level. To assist in obtaining these rates, the survey will oversample blacks, Hispanics, the elderly and children.

The diseases and other medical conditions to be studied include, but are not limited to, the following:

- Cardiovascular disease (heart disease);
- Cancer;
- Chronic obstructive lung disease, including:
  - Asthma;
  - Chronic bronchitis; and
  - Emphysema;
- Diabetes;
- Kidney disease and other urologic disorders;
- Gallbladder disease;
- Osteoporosis;
- Arthritis and related musculoskeletal conditions, including:
  - Rheumatoid arthritis; and
  - Osteoarthritis;
- Infectious diseases, including:
  - Immunization to childhood diseases;
  - Exposure to hepatitis A or B;
  - Exposure to human immunodeficiency virus (HIV); and
  - Exposure to sexually transmitted diseases, such as herpes simplex 1 and 2;

- Oral health problems, such as:
  - Caries;
  - Periodontal disease;
  - Tooth loss;
  - Soft-tissue lesions;
  - Trauma assessment;
  - Occlusal and dentofacial characteristics; and
  - Tooth restoration and prosthesis conditions;
- Allergies to:
  - Certain foods, animals, insects and molds;
- Mental health conditions, for example:
  - Depression;
- Hearing loss;
- Retinal Disease; and
- Nutritional disorders, such as vitamin and mineral deficiencies.

Risk factors are those aspects of a person's lifestyle, constitution, heredity or environmental exposures which may increase his/her chances of developing a certain disease or condition. Some of the risk factors to be included in this study are:

- Tobacco usage;
- Alcohol consumption;
- Physical activity;
- Sexual practices;
- Occupational exposures;

- Reproductive health, such as oral contraceptive use and breastfeeding practices;
- Weight;
- Dietary intake; and
- Stress.

The results of this survey will benefit the American people in two important ways. First, data on the distribution of health problems and potential risk factors in the population provide researchers with important clues to the causes of disease development. This survey will provide the data researchers need to establish hypotheses of disease causation which can be tested in future epidemiologic and clinical research studies. Secondly, information collected from this survey will be compared to information collected in previous HANES surveys and future HANES surveys in which study participants will be asked to be examined and interviewed again sometime in the future. This will allow researchers to determine the extent to which various health problems and risk factors have changed in the U.S. population over time. By identifying the health care needs of the population, agencies of the government and private sector can establish policies and plan research, education, and health-promotion programs which will help improve the current health status of the population and prevent future health problems.

By computing prevalence rates for the population as a whole and for specific age-race-sex groups (e.g., 30-35 year old white females), researchers can determine which subgroups of the population would benefit most from specific programs and policies. For example, information collected in this survey will help FDA decide whether to implement calcium fortification regulations for the nation's food supply and how best to implement the fortification program, if needed. Data from this survey will be used to revise the growth charts which are used widely by pediatricians to monitor the growth of children.

Study participants are first interviewed at their homes and asked detailed demographic, socioeconomic, and health-related questions. Extensive physical examinations by highly trained medical personnel, additional health interviews, dietary interviews, and biochemical tests on biological specimens are then conducted in specially equipped mobile examination centers (MECs). Persons who cannot or will not come to the MEC for the full-scale examination are asked to undergo certain parts of the exam at their homes.

In addition to using these data as a baseline for future follow-up studies and analysis, some blood and urine specimens collected in this survey will be stored. Biological specimen banking will be of value in the future as new techniques are developed to measure exposure to environmental contaminants or disease agents or when new health problems are recognized. Biological specimen banking will be used to permit future laboratory analyses for:

- Estimating the prevalence of factors of current interest but for which acceptable testing protocols do not yet exist (e.g., pesticides);
- Estimating the prevalence of factors of emerging importance (e.g., chlamydia subtypes, various types of non-A, non-B hepatitis); and
- Conducting studies to look for the specific causes of diseases (e.g., bacteria, viruses, toxic materials).

Four areas have been selected for special emphasis in NHANES III: child health; health of older Americans; occupational health; and environmental health.

Child Health. NHANES III will help researchers assess the physical and emotional health status of children in the U.S. Communicable diseases, such as influenza, measles, and chickenpox, are not the only causes of illness and disability in the young. The focus of the childhood component of NHANES III will be on:

- Chronic diseases (heart and lung diseases);
- Allergic conditions;
- Immunity to various infectious diseases;
- Nutritional status;
- Cognitive functioning (ability to function in the activities of daily life);
- Physical growth;
- Disorders of hearing and dentition; and
- Blood lead levels.

Older Americans. The U.S. has experienced dramatic growth in the number of older people during this century. These demographic changes have major implications related to health care needs, public policy, and changing research priorities associated with older Americans. Recognizing this, NCHS is working with a consortium of public health service agencies to improve information on the health of the elderly. NHANES III is designed to fill many of the gaps in our knowledge of the health of older people. The survey component for older persons focuses on physical health status and aspects of functional health status. The key components for this part of the survey are:

- Osteoporosis and the evaluation of lower extremity function, including risk of falls and fractures;
- Musculoskeletal function, focusing on osteoarthritis, as a major cause of disability in older persons;
- Nutrition, including the evaluation of obesity;
- Cardiopulmonary diseases, which are major causes of illness and death in older persons;
- Physical function (individual's capacity for self-care);
- Cognitive function (ability to function in the activities of daily life); and
- Social function (ability to live independently).

Occupational Health. This component of the survey will focus on exposures in the workplace, such as noise, chemicals, and dust, which may be associated with specific health problems, such as neurological problems, lung disease, and musculoskeletal injuries.

Environmental Health. The environmental health research topic for NHANES III focuses primarily on studying exposure to toxic metals and chemicals, such as pesticides, by examining blood specimens for levels of various metals and chemicals in the blood.

Westat is a survey research firm which has been awarded a contract by NCHS to carry out data collection activities for the survey. Westat is responsible for selecting the survey sample, scheduling and

planning study procedures, developing the survey materials, such as manuals and forms, hiring and training field personnel, making advance arrangements for each stand, conducting community outreach activities, setting up and maintaining field offices and Mobile Examination Centers (MECs), scheduling and conducting screening interviews and extended interviews in the household, conducting interviews and physical examinations in the MECs, designing and carrying out quality control procedures, transmitting data to NCHS, and shipping biological specimens to various laboratories in the U.S. The examination and interview components of this survey have been designed in close collaboration with the Federal agencies which will use the resulting data for program planning and regulatory and research purposes. The following agencies have been involved in designing NHANES III:

Agencies of the National Institutes of Health, Public Health Service

- National Heart, Lung and Blood Institute (NHLBI);
- National Cancer Institute (NCI);
- National Institute of Child Health and Human Development (NICHD);
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK);
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMSD);
- National Institute of Dental Research (NIDR);
- National Institute of Mental Health (NIMH);
- National Institute of Neurological and Communicative Disorders and Stroke (NINCDS); and
- National Institute on Aging (NIA).

Other Federal Agencies

- Environmental Protection Agency (EPA);
- Food and Drug Administration (FDA);
- National Institute of Occupational Safety and Health (NIOSH); and
- National Institute of Environmental Health and Safety (NIEHS).

1.2 History of the Health and Nutrition Examination Survey

The National Health Survey Act, passed in 1956, provided the legislative authorization for a continuing survey to collect statistical data on the amount, distribution, and effects of illness and disability in the United States. In order to fulfill the purposes of this Act, it was recognized that data collection would involve at least three sources: the people themselves by direct interview; clinical tests, measurements, and physical examinations on sample persons interviewed; and places where persons received medical care such as hospitals, clinics, and doctors' offices.

To collect data by interview and physical exam, NCHS conducted four separate examinations surveys between 1959 and 1976. The first Health Examination Survey (HES I) focused mainly on selected chronic diseases of adults aged 18 - 79. HES II and HES III, conducted between 1963 and 1970, focused primarily on the growth and development of children.

The fourth survey introduced a new emphasis: the study of nutrition and its relationship to health status. This had become increasingly important as researchers began to discover links between dietary habit and disease. In response to this concern, under a directive from the Secretary of the Department of Health, Education and Welfare, the National Nutritional Surveillance System was undertaken by NCHS. The purpose of this system was to measure changes in nutritional patterns over time. However, a special task force recommended that the continuing surveillance system be expanded to include clinical observation and professional assessment as well as the recording of dietary intake patterns. Thus, the National Nutritional Surveillance System was combined with the Health Examination Survey to form the National Health and Nutrition Examination Survey, NHANES.

NHANES I, the first cycle of the NHANES studies, was conducted between 1971 and 1974. This survey obtained a national sample of about 21,000 persons between the ages of 1 and 74 years of age. Extensive data on health nutrition were collected by interview, physical examination, and a battery of clinical measurements and tests from all members of the sample.

The planning process for NHANES II was carried out in 1974 and 1975 in collaboration with other Federal agencies. Throughout the planning stage there was continual awareness of the necessity of making the data collection for NHANES II comparable to the first NHANES survey so that NHANES I data could serve the purpose of providing a baseline for assessing changes overtime. This means that many of the same measurements had to be taken the same way on the same age segment of the U.S. population in both surveys. The NHANES II survey began examinations in February 1976 with the goal of interviewing and examining 21,000 persons between the ages of 6 months and 74 years. This survey was completed in 1980.

In addition to NHANES I and NHANES II, a special survey of the U.S. Hispanic population, HHANES, was undertaken to provide information on the health and nutrition status of Hispanics comparable to that obtained for the general U.S. population. The survey was completed in 1984. A fourth NHANES project, the NHANES Epidemiologic Followup Survey, was recently completed. This study was an effort to conduct followup interviews with the sample population, now aged 35-84, who were interviewed and examined in NHANES I between 1970 and 1974.

NHANES III is the third cycle in the NCHS series of surveys to collect data on the health and nutrition of the people of the United States through interviews and physical examinations. As in previous NHANES cycles, the survey's primary purpose will be to produce descriptive statistics that can be used to measure and monitor the health and nutritional status of the civilian, noninstitutionalized U.S. populations.

The plan is to administer a household interview and a 4-hour examination consisting of medical procedures, biochemical tests, and questionnaires to 40,000 sample persons aged 2 months and older over a period of approximately 6 years. The survey will be conducted in 2 rounds of about 3 years each in approximately 88 locations across the country.

NHANES III will serve to collect public health data for use in evaluating the health status of the U.S. population and determining how health status is affected by social and economic conditions. The wide range of statistics produced will be valuable for:

- Estimating the prevalence of selected diseases and conditions;
- Assessing health and nutritional status;
- Determining needs for health care;
- Analyzing relationships between health measures and risk factors; and
- Evaluating aspects of health and nutrition.

A number of longitudinal studies which use NHANES III data as baseline data are planned. These studies will follow the sample persons interviewed and examined during NHANES III over a period of years to attain measures of changes in health status and to study human growth and development in detail.

1.3 About Westat

Westat is an employee-owned research firm founded in 1961 and located in the Metropolitan Washington, DC area (Rockville, Maryland). Westat is recognized as one of the leading research firms engaged in survey research, program evaluation, mathematical and statistical analysis, and computer applications. Although primarily involved in conducting surveys for agencies of the Federal Government, the company has also served local government agencies, universities, professional societies, nonprofit institutions, and commercial enterprises.

The professional staff of more than 450 includes statisticians, epidemiologists, psychologists, sociologists, survey managers, market research analysts, economists, and computer systems analysts with specialized knowledge in health, labor, housing, and education. A highly trained nationwide field staff of supervisors, interviewers, and survey assistants provides additional support to the organization.

A large number of the studies Westat manages are concerned with the health of various subgroups of the population. The success of these projects can be attributed in part to the company's ability to enlist the cooperation of individuals and groups in the communities where the studies are conducted. For instance, it may be necessary to obtain cooperation from state or local government officials, professional associations, hospital administrators, citizen groups, and individuals.

Many of Westat's studies in the area of health involve nationwide data collection efforts in hundreds of different communities. For example, in 1979-80, Westat enlisted 38,000 U.S. school children in a study to estimate the prevalence of dental caries (cavities) and other oral health problems in that population. A second dental survey conducted in 1986-87 involved 45,000 school children. Fourteen teams, each with a dentist, a data recorder, and 2 coordinators, traveled to schools across the U.S. to collect data from students via dental examinations and interviews.

1.4 Pretest and Main Survey Schedules

1.4.1 Pretests

1.4.1.1 Purpose of the Pretests

Before any large-scale data collection effort is started on a survey, one or more pretests are conducted. During a pretest, field procedures and data collection instruments are tested and evaluated, then refined by the researchers. Field procedures are carried out just as they would be in the main study, but during the pretest a much smaller group of sample persons is selected. After the completion of a pretest, a series of meetings is held and suggestions for improving the field procedures and data collection instruments are incorporated into the plans for the main study. In this way, potential problems are resolved before the main survey begins, although it is inevitable that some unanticipated problems will arise as the study progresses.

1.4.1.2 Summary of the Pretests

Since NHANES III is so large and complex, four pretests were scheduled from September 1987 through December 1988. The first three pretests were conducted at different sites to evaluate the performance of the field procedures in various locations. The fourth pretest, or "Dress Rehearsal" was conducted in October 1988 and was intended to provide a final practice of all procedures before the main survey was initiated. Following is a summary of the pretests, the locations, the number of sampled persons (SPs), and the procedures tested.

Pretest I

LOCATION: Los Angeles, California
DATE: October 1987
DURATION: Six weeks
NUMBER OF SPs: 450
Questionnaires and interviewer field procedures were tested and evaluated.

Pretest II

LOCATION: Washington, D.C.
DATE: October - December 1987
DURATION: 9 weeks
NUMBER OF SPs: 600
MEC procedures and examinations tested.

Pretest III

LOCATION: Tampa, Florida
DATE: February - March 1988
DURATION: Six weeks
NUMBER OF SPs: 500
All office, interviewing and MEC procedures tested.

Pretest IV ("Dress Rehearsal")

LOCATION: College Park, Maryland
DATE: October 1988
DURATION: 6 weeks
NUMBER OF SPs: 450
Final testing of all procedures

1.4.2 Schedule for the Main Survey

Data collection for the main survey of 40,000 sample persons (SPs) began in September l988 and will be conducted in 2 cycles of approximately 3 years in length. Field office staff, interviewers, and 2 examination teams will travel to approximately 44 locations throughout the U.S. in each cycle. The average stand size will be about 450 SPs (within a range of 300-600 SPs). At any given time during the survey, examinations will be conducted at two stands simultaneously for 10 1/2 months of the year. There will be breaks of about 2 weeks around Christmas and about 2 weeks during the summer.

1.5 Sample Design

A sample is defined as a representative part of a larger group. Surveys involve studying a sample of persons rather than conducting an expensive and time-consuming census whereby every person in the population of interest is studied. Since it is impossible to interview and examine everyone in the U.S. for NHANES III, a representative sample is taken of the nation's population. At the conclusion of the study, estimates will be made of the prevalence of various health conditions and risk factors for the entire U.S. population, based on what is learned from the sample of people studied in the survey. By studying a representative sample of the population, it is assumed that the findings would not have been too different had every person in the U.S. been studied. Because generalizations about the population will be made, it is extremely important that the sample be selected in such a way that it accurately represents the whole population. Statisticians must calculate the size of the sample needed and take into consideration the geographic distribution and demographic characteristics of the population such as age, sex, race, and income.

After a decision has been made on the size and characteristics of the sample, the next step is to determine the method of drawing the sample. For NHANES III, a multi-stage approach is being used.

Stage 1: Sampling PSU's.

The U.S. is divided into geographic regions called Primary Sampling Units (**PSU's**). Each PSU is a county or small group of contiguous counties. At the home office, Westat statisticians randomly select 88 PSU's to be included in this study. The probability (likelihood) of a PSU being selected depends on its size (i.e., the more people who live in the PSU, the more likely it will be sampled). Each PSU that is selected is called a **stand**. Exam teams will travel to each of the 88 stands to conduct exams and interviews in the MECs.

Stage 2: Sampling BG/ED's.

Each selected PSU is comprised of block groups (**BGs**), defined by the Census Bureau, or enumeration districts (**ED's**). The home office randomly selects BG/ED's to be included in the study. Similar to Stage 1, the probability of a BG/ED being selected depends on its size.

Stage 3: Sampling segments.

Each BG/ED is comprised of **segments** which are clusters of homes. Segments are randomly selected to be included in the study. The larger the segment the more likely it is to be selected. Project staff called listers go to each segment and, using special forms, list the addresses of all dwelling units (houses, apartments, mobile homes) in that area.

Stage 4: Sampling households from the field listing.

Not all households in a stand are selected for the study. Home office project staff randomly select households from the field listings.

Stage 5: Selecting eligible persons (screening).

Field interviewers go to each sampled household identified in Stage 4. The interviewer administers a 10-minute screening questionnaire (Household Screener Questionnaire) to determine the household composition and sex/race/age/ethnicity characteristics of the household members. Depending on the characteristics of the household, only certain households are selected for the final sample. Interviewers have written instructions from the home office on how to conduct this stage of sampling.

Stage 6: Choosing Sample Persons in the selected households.

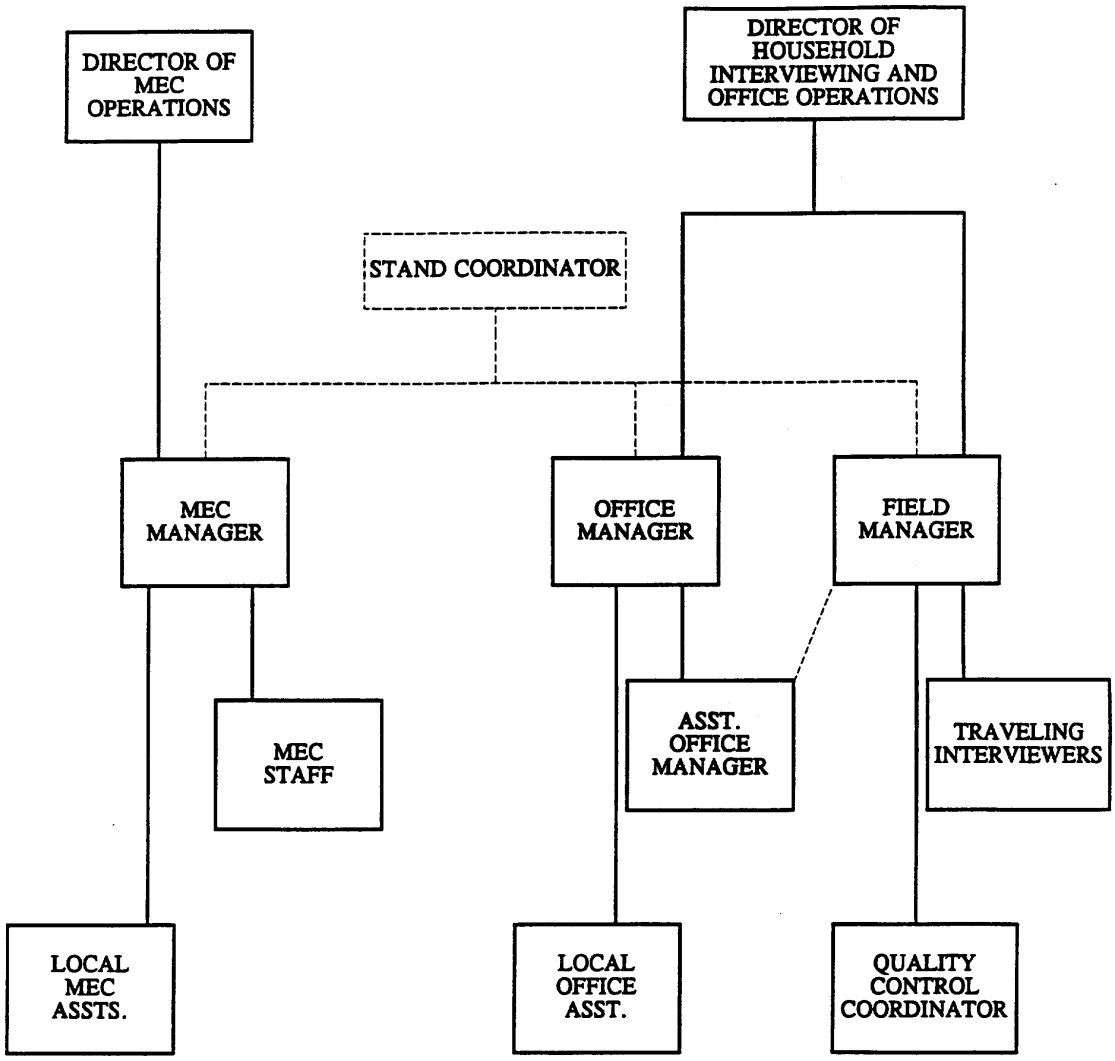
Following the screener sampling instructions, in a typical household 2-3 persons will be selected. However, in some households we may select none and in others as many as 10. Each individual selected for the study is called a **Sample Person (SP)**.

1.6 Personnel and Reporting Relationships

There are two different organizations conducting NHANES III. The National Center for Health Statistics (NCHS) is the government agency sponsoring, and ultimately responsible for, the survey. NCHS has contracted with Westat to conduct the field operations for the survey. NCHS staff and consultants from both NCHS and Westat participate in staff training programs and pretest activities, and periodically visit the field operations during the main survey.

As a member of the exam team staff, you are an employee of Westat and will report directly to Catherine Novak, Director of MEC operations for the Westat staff. Exhibit 1-1 shows the formal reporting relationships for the project. Renee Slobasky serves as the NHANES project director for the Westat home office. Dr. Carla Maffeo, technical director for examinations at Westat's home office, is responsible for technical issues, such as how an exam procedure or biochemical test should be done. Exam or personnel matters should be discussed with the Director of MEC operations. The MEC manager, who is responsible for day-to-day activities of the MEC at the stand, should be consulted for such questions regarding the automated system, equipment, supplies, data collection, sterilization of instruments, storage and shipment of data and specimens, and administrative issues.

Exhibit 1-1. Reporting relationships



A Stand Coordinator is also designated for each stand and will be responsible for coordinating stand activities with the other on-site managers.

1.7 Advance Arrangements for a Stand

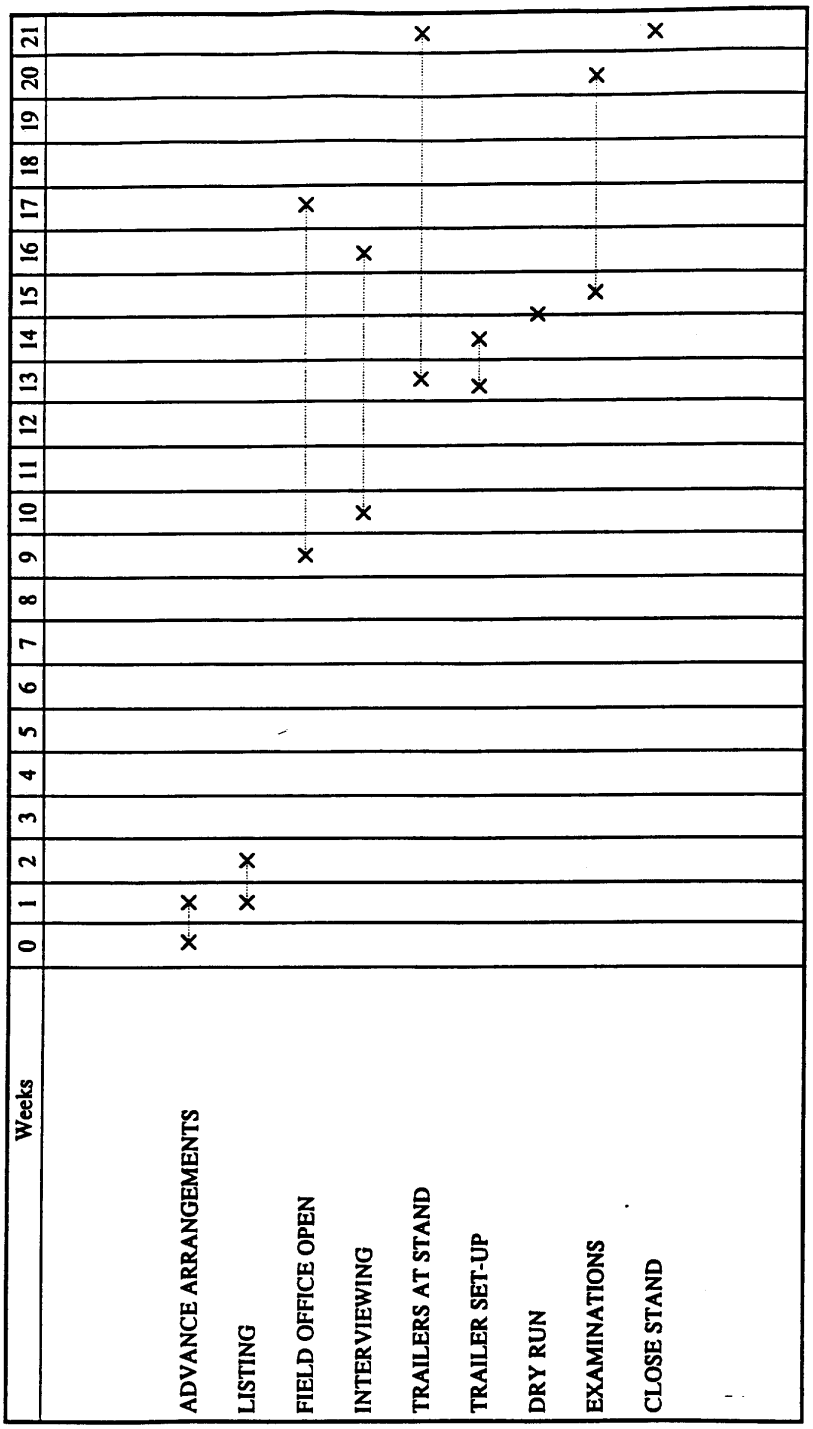
1.7.1 Schedule for Advance Arrangements

Exhibit 1-2 summarizes the schedule for a stand. Advance arrangements begin in Westat's home office at least 10 weeks prior to the start of interviewing at a stand. Members of the advance arrangements team study maps and familiarize themselves with the layout of a stand, location of sampled segments, major highways and arteries, public transportation, and sites that appear appropriate for location of the MEC. Once they have a basic knowledge of the layout of the area, they contact local officials identified by our outreach program as prospective knowledgeable informants and make arrangements to visit the prospective stand.

The field office is opened at least 1 week prior to the start of household screening and interviewing. During that week the rental furniture and office equipment arrive, supplies shipped to the site from the home office are unpacked, telephones are installed, and computer systems are tested. A member of the advance arrangements team is at the stand during this period.

At least 1 week before examinations begin, the MEC is delivered to the prearranged site. The MEC manager will be on hand to receive the trailers and direct their location and leveling by the shipping firm, to oversee the hookup of electricity and plumbing lines by local contractors, and to verify the presence of the previously arranged security. After the trailers are set up, examination staff members unpack, calibrate and test the equipment. Medical and laboratory supplies delivered to the MEC are unpacked and stored. These preparations are scheduled and managed so that the MEC is ready for its dry run prior to the first scheduled examinations.

Exhibit 1-2. Stand schedule



1.7.2 Community Outreach Activities

Westat and NCHS have developed a comprehensive and effective outreach program. This program is directed from the Westat home office under the supervision of the Director of Advance Arrangements, Jack Powers. Outreach activities are initiated prior to entering a stand and continue throughout the period of interviewing and examinations.

The purpose of the outreach activities is to inform public officials and potential participants about NHANES III. In informing public officials, regardless of whether their active support is sought, it is hoped that by providing information the study will be recognized as a legitimate and important research effort. The goal of outreach programs directed to potential sample persons is not only to provide information, but to encourage them to take part in an important study.

Westat directs the outreach program to audiences at the national, regional, state and local levels. Through Westat, public officials receive a letter from NCHS describing the survey, a fact sheet explaining technical aspects of the study, and a brochure.

It is important to establish a positive relationship with local health officials and other community representatives as their active support will help legitimize the survey. These persons can also assist during advance work by providing an introduction to other community officials whose cooperation may be important to the survey.

Westat has developed a community outreach program to be activated in each stand incorporating various types of media. The goal is to reach as many of the target populations as possible via radio, television and newspapers in each community. Posters and flyers, in English and Spanish, will be distributed and posted in highly frequented areas, such as churches and community centers, shopping centers and high-rise apartment buildings.

Another purpose of the outreach program is to identify local physician's and dentist's offices or clinics to which the examination reports of findings may be sent for those SPs who are referred for immediate medical or dental care but who report no regular source of health care.

1.8 Data Collection

Data for NHANES III are collected in two phases:

- Household interviews in which SPs are asked detailed demographic, socioeconomic, and health-related questions; and
- Extensive physical examinations, dental examinations, health and dietary interviews, and laboratory tests on biological specimens conducted in mobile examination centers (MECs).

The household component and MEC component are discussed in more detail in the following section.

1.8.1 The Automation System

An automated system has been developed for survey control and capture of interview and examination data in the field. In the MEC, this system will collect, record, account for and transmit examination and interview data. In addition, the computerized flow system will process examinees through the MEC. A more detailed explanation of the MEC Automation System is given in The NHANES III Laboratory Automation System Manual.

1.8.2 Household Interviews

The field interviewers conduct all household interviews and schedule appointments for examinations in the MEC.

1.8.2.1 Advance Letter

As mentioned in Section 1.5, certain households are sampled for the survey. Before an interviewer contacts a household, the Westat home office mails an advance letter to the household.

The advance letter is an important tool for introducing and legitimizing the study. The letter clearly states the purpose and importance of the study, a respondent's rights as a participant, including the confidentiality of information given and the voluntary nature of participation, and indicates that an interviewer will be coming to the household in the near future.

1.8.2.2 Household Screening Interview

Upon arriving at a home, interviewers are instructed to show the advance letter at the door (if the respondent has not seen or does not remember the letter), the screener brochure, and his/her survey I.D. badge.

- **The Household Screener Questionnaire** is administered to one eligible respondent living in the selected dwelling unit who is at least 17 years of age and preferably the head of the household. It includes an introduction, a household enumeration section (including a series of questions identifying secondary families), and an eligibility criteria section collecting information on age, sex, and race or ethnic background. The Screener takes about ten minutes to administer. Once the interviewer has determined that at least one person in the household is eligible to participate in the survey, he/she attempts to administer the family questionnaire, the medical history interview and make an examination appointment. During this process, each selected respondent receives a sample person brochure.

- **The screener brochure** contains a brief description of the study and provides answers to typical questions a respondent might have during initial contact.

- **The sample person brochure** contains more detailed information on the extended interview and examination component of the study. The interviewer distributes this brochure to eligible respondents upon completion of the screening. The brochure describes the examination to be conducted in the MEC and, like the screener brochure and advance letter, emphasizes the purpose and importance of the study, voluntary participation and confidentiality of the information provided. It also includes the Informed Consent Form.

1.8.2.3 Informed Consent

- **Consent form**. The last page of the Sample Person Brochure contains the consent form. The SP must sign the form as an indication of his/her willingness to participate in the study. If the SP does not wish to sign the consent form at that time, he/she may bring the signed form to the MEC at his/her scheduled exam time, or may have additional questions answered at the MEC before signing the form. A refusal to sign the consent form is considered a refusal to participate in the examination phase of the study. Examinations will not be conducted on sample persons who do not return a signed consent form. To participate in the household interviews, an SP only needs to give verbal consent.

For minors the signature of a parent or guardian is required on the consent form. Minors over the age of 12 years are also asked to sign the form as an indication of agreement to participate.

By signing a consent form, a person gives permission for the SP to have the extensive physical exam in the MEC (or the home health examination). A copy of the Home Health Exam Fact Sheet will be given to each SP who is offered the home examination option.

1.8.2.4 Extended Household Interviews

- **The Family Questionnaire** is administered to one eligible respondent in each family who is at least 17 years of age and preferably the head of the household. Information is collected on family relationships, demographics, health insurance, housing, and income. It also contains instructions for within household sampling.

- **The Sample Person Questionnaire** is administered to each sample person or an eligible proxy. A detailed health history is collected on each sample person. The extended interviews require about 40 minutes for each SP. There are two versions of the SP Questionnaire, one for adults and one for youths. Information about SPs who are 2 months to 16 years old is obtained through direct interviews with a proxy, such as the child's parent.

1.8.2.5 Exam Appointments

Interviewers make appointments for SPs to receive physical examinations at the MEC. The interviewer calls the field office to obtain an exam appointment time. If the SP agrees to the time, the information is entered into the field office Automated Survey Management System.

1.8.2.6 English and Spanish Study Materials

The advance letter, brochures, consent form, and household questionnaires are printed in both English and Spanish. Bilingual interviewers use the language with which the respondent feels most comfortable.

1.8.3 Exams and Interviews in the Mobile Examination Center (MEC)

1.8.3.1 The MEC

Examinations and interviews are conducted in specially equipped and designed mobile examination centers (MECs) each consisting of four trailers. Each trailer is approximately 45 feet long and 8 feet wide. The trailers are drawn by detachable truck tractors when moving from one geographic location to another. At an examination site, such as a hospital parking lot, the four trailers are set up side-by-side and connected by enclosed passageways. At any given time during the survey, there are two MECs set up at two different stands and a third MEC is either in transit or in for maintenance.

Exhibit 1-3 shows a floor plan for the MEC. The interior of each MEC is designed specifically for this survey and incorporates many customized features. For example, the trailers are divided into specialized rooms to assure the privacy of each study participant during the exams and interviews. Also, the audiometry room is soundproofed and the X-ray room shielded with lead. The MEC houses all of the state-of-the-art equipment and supplies necessary for the exams and biochemical tests conducted in the MEC.

1.8.3.2 Exam Sessions

The MEC remains at a stand for approximately 6 weeks (range 4-8 weeks). During that period, the MEC operates 5 days a week including weekday, evening and weekend sessions. Two 4-hour sessions are scheduled each day with 10 examinees per session.

Exhibit 1-3. Floor plan of MEC

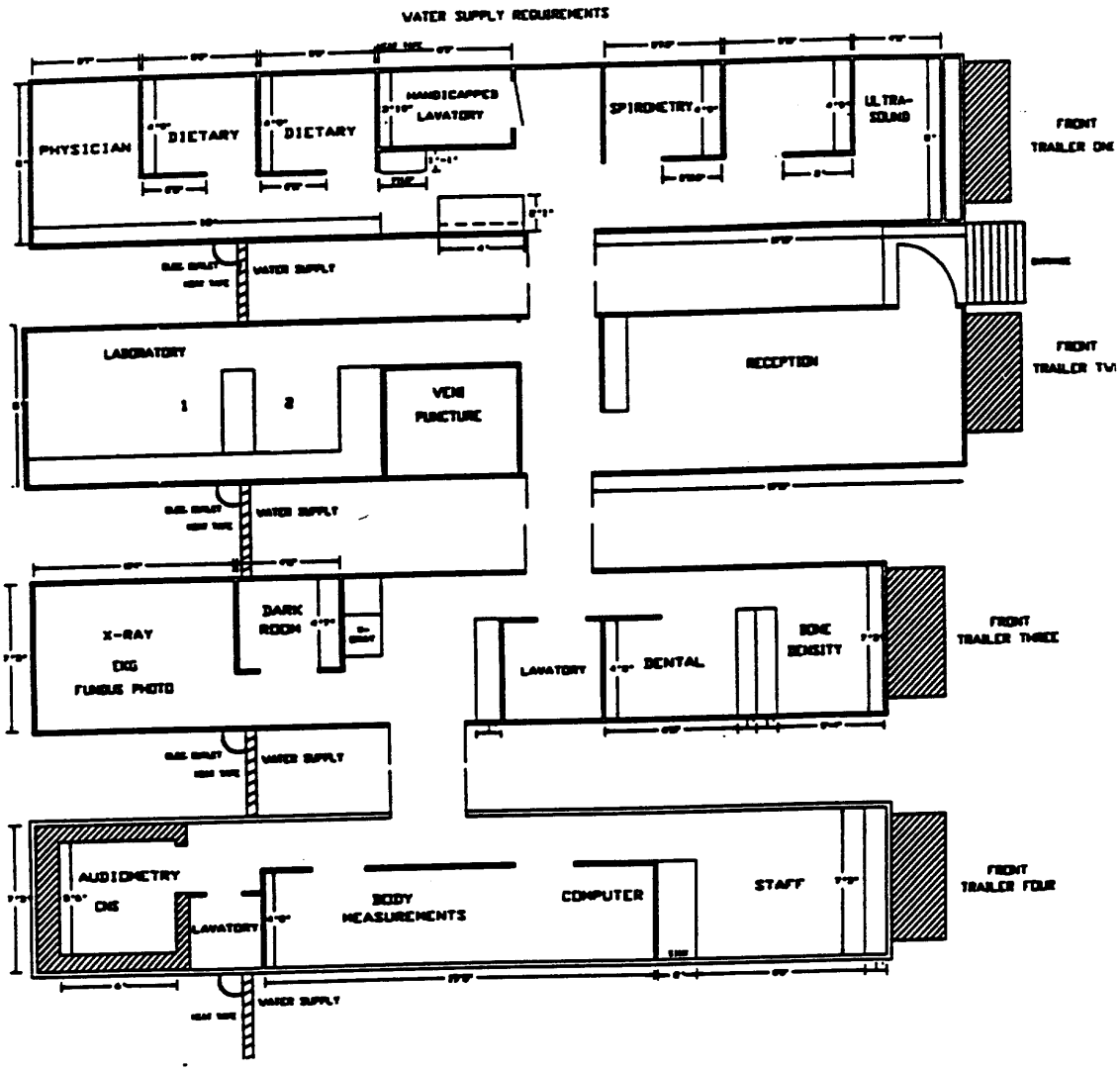


Exhibit 1-3. Floor plan of MEC (continued)

Trailer	Room	Room Use
Trailer I	Physician	Physical examination by a physician
	Dietary	Dietary and food frequency interview
	Dietary	Dietary and food frequency interview
	Interview	Cognitive test and neurological tests
	Spirometry	Tests lung function
	Ultrasound	Ultrasound exam for gallstones
Trailer II	Waiting Area	Waiting area for sample persons
	Reception	Welcoming station and public waiting room
	Venipuncture	Drawing of blood samples, GTT
	Lab	Centrifugation preparation and analysis, blood processing, hematology and blood chemistry laboratory
Trailer III	X-ray/ECG/	X-rays of hand, knee; test heart function
	Fundus Photography	Photo of the fundus of the eye
	Dental	Dental exam by a dentist
	Bone Densitometry	Measures bone density
Trailer IV	Audiometry	Hearing tests
	Body Measurements/ Allergy	Height, weight, and other physical measurements/Allergy testing
	Computer	Storage of collected data
	Lounge	Staff

1.8.3.3 Exam Team Responsibilities

The two exam teams travel from stand to stand to conduct the exams and interviews in the MECs. There are 16 individuals on each traveling team. In addition, a local assistant will be recruited, trained, and employed at each stand to assist the exam staff. The duties of the exam team members are summarized below.

- One coordinator directs the flow of SPs through the MEC examination process. The coordinator manages all SP appointments, prepares the SP examination folders, and verifies that all exam components have been conducted and recorded before the SP leaves the MEC.

- One physician reviews the SP's medical history, conducts the medical examination, and records the results of the exam. The physician also reviews the X-rays, the results of the blood test (CBC) and the ECG.

- One dentist conducts the dental exam and "calls" the results to a health technician who records the dentist's exam findings.

- One health interviewer administers questionnaires for cognitive and neurological tests and records the results.

- Two dietary interviewers administer the SP dietary questionnaire. During the interview the interviewer records (a) a 24-hour dietary recall of the types and amounts of all foods and beverages consumed by the SP in the last 24 hours and, on selected SPs, (b) food frequency information regarding how often certain types of foods were consumed by the SP in the past month.

- Four certified radiologic health technologists take and record body measurements, X-rays, bone densitometry, pulmonary function tests (spirometry), ECGs, photos of the fundus of the eye, administer audiometry and allergy exams, and record the dental exam findings. The duties of the health technicians are assigned on a rotating basis.

- One certified ultrasonographer performs sonography of the gallbladder, and also assists health technicians in performing selected other tests such as allergy, audiometry, spirometry and body measurements.

- Three certified medical technicians/technologists conduct clinical laboratory tests on blood and urine specimens, record the results of tests, and prepare and ship specimens to various laboratories.

- One certified phlebotomist administers the phlebotomy questionnaire, draws blood from SPs, and administers Trutol for the glucose tolerance test (GTT).

- One home health technician conducts home exams, and works as a health technologist and a laboratory technologist when there are no home exams scheduled.

Each MEC staff member is part of a team of professional persons with specific assignments that must be completed in order to accomplish the overall objective of the National Health and Nutrition Examination Survey. Each individual must be aware of and respect the job demands placed upon other staff members, maintain an attitude of tolerance and consideration for fellow members of the team, and willingly perform any extra tasks that may be assigned to support other staff members in the performance of their duties. MEC staff members may be requested to perform tasks not directly related to their specific professional skills in order to implement the overall data collection plan. Team members will rotate periodically to prevent the introduction of bias into the exam results due to "team effects" .

1.8.3.4 Exam Components

Each SP exam takes up to 4 hours. The actual length of time depends on the age of the SP, as some exam components are only done on certain age groups (adult SPs tend to receive more extensive exams). Exhibits 1-4 and 1-4a present lists of exam components for each age group. Exhibit 1-5 presents an estimate of the number of minutes for each exam component.

Some blood specimens are analyzed in the MEC by the medical technologists while other specimens are sent to various laboratories in the U.S., such as the Centers for Disease Control (CDC), and have special storage and shipping specifications.

1.8.3.5 Sample Person Remuneration

SPs who complete all or part of the exam in the MEC are given a monetary token of appreciation for their time and effort. This remuneration is in addition to the payment for transportation expenses. Adult examinees will receive $30 or $50, depending on whether they accept an appointment at a particular time. Also adults who receive special components, such as the volatile toxicants study, will receive additional remuneration. Children will receive $30.00.

Exhibit 1-4. Examination components by age groups

2-11 mos.	1-5 yrs.	6-19 yrs.	20 yrs. +
Physician exam	Physician exam	Physician exam	Physician exam
Body measurements	Body measurements	Body measurements	Body measurements
Dietary interview	Dietary interview	Bioelectrical impedance	Bioelectrical impedance
Dental exam	Dental exam	Dietary interview	Dietary interview
	Venipuncture	Dental exam	Dental exam (up to 74)
		Tympanic impedance	Venipuncture
		Venipuncture	Urine collection
		Audiometry	Cognitive tests (60+)
		Urine collection	Neurological tests (20-59)
		Cognitive tests	Allergy skin test (20-59)
		Allergy skin test	Spirometry
		Spirometry	Joint X-ray (60+)
		MEC questionnaire	Electrocardiogram (40+)
			Glucose tolerance test (40-74)
			Ultrasound (up to 74)
			Bone densitometry
			Physical function (60+)
			Fundus photography (40+)
			MEC questionnaire

Exhibit 1-4a. NHANES III Examination Components

Components	Ages
Physician exam	all
Phlebotomy	1+
GTT	40-74
Body measures	all
24-hour recall	all
Food frequency	6-19
ECG	40+
Bioelectrical impedance	12+
Spirometry	8+
Dental	2 mos-74
Bone densitometry	20+
Ultrasound	20-74
Allergy (adult half sample)	6-59
Physical function	60+
Cognitive function	60+
MEC questionnaire-adult + Dis	20+
MEC questionnaire - youth	6-19
MEC questionnarie - proxy youth	20-39
CNS (half sample)	20-59
Cognitive testing-child	6-19
Joint X-ray	60+
Audiometry/tympanometry	6-19
Urine collection	6+
Fundus photography	40+

Exhibit 1-5. Estimated number of minutes for each exam component

EXAM COMPONENTS	SAMPLE PERSON LENGTH OF TIME (IN MINUTES)
Physical Exam	10
Body Measurements	9
Bioelectrical Impedance	3
Dietary Interview	19
Food Frequency (12-16)	12
Fundus Photography	6
Dental exam	8
Tympanic Impedance	5
Venipuncture, GTT	19
Audiometry	10
Cognitive and Neurological Tests and Health Interview	30
Allergy Skin Test	7
Spirometry	11
X-rays of Hand, Knee	8
Electrocardiogram (ECG)	13
Ultrasound	10
Bone Densitometry	16

1.8.3.6 Report of Exam Findings

For each SP examined in the MEC, the routine blood pressure and dental findings will be reported to the examinee prior to his/her leaving the MEC. A report of all other findings will be generated by the automated system at NCHS summarizing the findings of the physical exam and biochemical tests. This Report of Findings form will be produced **after** the stand is closed, and **mailed** to the SP. The dentist completes a report of the dental exam findings which is alsogiven to all SPs. Additionally, for SPs who are referred for immediate medical or dental care, a report is sent to the SP's personal physician, dentist or clinic. If the SP does not have a personal physician, dentist or clinic, a list of community clinics will be shown to the SP by the MEC coordinator who will encourage the SP to choose one; the report of the physician's/dentist's findings is then sent to that clinic. If the SP refuses to choose a health care provider, the report of the physician or dentist's findings is given to the SP.

In the MEC, in those instances when the physician or dentist finds a condition that warrants immediate attention from the ECG, hematology, X-ray, dental, or blood pressure results, or from an unexpected incident, the physician or dentist will contact the SP's health care provider by telephone.

1.8.3.7 Dry Run

At the beginning of each stand, members of the MEC staff will devote one-half day to calibrating instruments and practicing MEC procedures. Since the MEC will be moving from one stand to another, it is important to check the equipment before exams begin to make sure everything is working properly. If there are problems with any of the equipment, including the automated system, the stand manager must be informed so that malfunctions can be repaired before the real exams begin. In addition to calibrating instruments, the dry run will give MEC staff an opportunity to practice their assigned duties, including setting up equipment and supplies, verifying instrument quality control results, sterilizing instruments, processing examinees through the MEC, interacting with other MEC staff members and examinees, performing exam procedures, recording exam results on the automated system, completing required forms, and shipping data and specimens to Westat and various laboratories. All procedures in the dry run will be completed as though the actual study were being conducted. The only difference is that in the dry run the examinees will be volunteers who are not part of the actual sample for the main

study or pretests. To solicit volunteers from the community, someone from the field office may post an advertisement at a local grocery store. Other volunteers may include local officials who want to see first-hand the type of exams to be conducted, field office staff, field interviewers, and MEC staff.

Problems identified during the dry run will be discussed by the MEC manager and MEC staff. Based on the results of the dry run, certain procedures may need to be modified or additional quality control procedures may be instituted by the home office in order to overcome or alleviate identified problems.

1.8.4 Home Exams

An examination in the home will be available for selected SPs who are wheelchair or bed-bound or unable or unwilling to go to the MEC for an examination. The household interviewers will determine when an SP should be offered the home exam, and the field office will schedule the appointment. If the SP is reluctant to participate in a MEC exam, every attempt will be made to persuade the SP to agree to an exam, either at the MEC or in his/her home. Because of equipment and staffing considerations, only certain exam components can be conducted in the home. For instance, any equipment required for the home exams must be portable and relatively compact when packed. Exhibit 1-6 lists the exam components which are conducted in the homes of SPs. As with the full-scale MEC exam, the components of the exam depend on the SP's age.

The home examiner conducts the examination of SPs in the home. All tests are completed on-site with the exception of the blood tests, which are prepared and shipped from the MEC. After completing an SP exam, the home examiner will return to the MEC with the blood tubes and enter the results of the home examination phlebotomy into the automated system in the laboratory. The blood is processed and shipped with the blood collected in the MEC.

SPs who complete the home exam are given $15 as a token of appreciation for their time and effort. This is less than the remuneration for the MEC exam because the home exam is less extensive.

Exhibit 1-6. Home exam components

	AGE		
	2-11 months	20-59 years	60+ years
COMPONENTS			
Body Measurement (Height, Weight, Mid-Arm Girth & Tricep Skinfold)	X	X	X
Head Circumference	X		
Venipuncture		X	X
Spirometry		X	X
Cognitive Tests			X
Physical Function Exam			X
Infant Food frequency	X		
Selected Conditions/Medicine, Vitamin & Mineral Usage/Tobacco/ Reproductive Status		X	X
TIME (Minutes)	10	40	50

1.8.5 Special Studies

At times during the study, special projects may be implemented to obtain information about a specific area of interest, as NHANES III provides an unusual opportunity to capture large amounts of data in an efficient manner. The volatile toxicant study is one such special study.

1.8.5.1 Volatile Toxicants Study

The volatile toxicant study is being sponsored by the toxicology branch of the CDC as an additional component of NHANES III. Extra blood and urine samples are to be collected from 45 volunteers at each stand and analyzed by CDC for selected variables. Volunteers are paid $10 for participating in the study.

Recruitment for the study will begin on the first day of exams at each stand and continue until 45 sample persons have volunteered. Only sample persons between the ages of 20 and 59 are eligible for the study. The phlebotomist is responsible for recruiting sample persons at the time of the first venipuncture. Because the MEC itself may be a source of some of the chemicals CDC is measuring in this study, the blood and urine samples must be collected as soon as possible after the sample person enters the MEC.

If a sample person agrees to participate in the study, one 10 ml gray top tube and one 10 ml non-silicone coated red top tube are obtained on the first draw. If this is not possible, the sample person will be asked if a second stick can be performed. If the SP is over the age of 40 years and will have a second venipuncture for the glucose tolerance test, the additional blood may be drawn at that time.

The required 45 ml of urine is obtained from the urine specimen which is collected when the sample person first enters the MEC, assuming that the first specimen is of sufficient volume to allow this. If the required amount of urine cannot be obtained from the initial sample, a second urine specimen will be collected.

The sample person is also asked to complete a self administered questionnaire as part of the volatile toxicants study. The phlebotomist collects the questionnaires from the coordinator at the end of the session and mails the questionnaire with the urine samples to CDC.

1.9 Confidentiality and Professional Ethics

All information collected for this study must be kept strictly confidential except as required by law. Since this study is being conducted under a contract with the National Center for Health Statistics, the privacy of all information collected is protected by two public laws: Section 308(d) of the Public Health Service Act (42 U.S.C. 242m) and the Privacy Act of 1974 (5 U.S.C. 552a).

Each person working on the study must be continuously aware of the responsibility to safeguard the rights of all the individuals participating in the study. Each study participant should be treated courteously, not as a sample number. Never divulge names or any other information about study participants except to the research team. Refrain from any discussions about study participants, in or out of the MEC, which might be overheard by people not on the survey staff. All of the members of the research team are under the same legal, moral and ethical obligations to protect the privacy of the SPs participating in the study.

When the study is finished, all of the collected information will be summarized by NCHS in a report. No participant names will be included in any reported results. Neither NCHS nor Westat is allowed to release information that would identify study participants without the consent of the participants.

Cooperation from the public is essential to the success of survey research. Westat expends a great deal of effort in obtaining cooperation from national, regional, state, and local officials and the general public. It is the responsibility of each person working for Westat to build on the company's reputation of integrity so that we can continue to have access to study participants during current and future studies; therefore, professional conduct both on and off the job is very important.

As you travel across the country for this study, you may find yourself to be very much in the public eye, particularly in the smaller towns where your presence is easily recognized. Each staff member has a responsibility to the Public Health Service and to Westat for promoting good public relations. The Public Health Service and Westat will be judged by the actions of the staff both on and off duty; consequently, you must be discreet in speech and actions. Your personal appearance and behavior must be governed by these same considerations. Be aware of the customs of the area and avoid any actions which might be interpreted unfavorably by the public, for example, parking a Westat vehicle in a questionable location. Please be aware of your "audience" at all times and try to avoid statements or actions that could shed an unfavorable light on Westat, the Public Health Service, or the survey.

You will be asked to sign a pledge of confidentiality before the survey begins. This pledge states that you understand that you are prohibited by law from disclosing any information obtained while working on the study to anyone except authorized staff of NCHS and Westat and that you agree to abide by the Assurance of Confidentiality.

This chapter of the manual was designed to provide you with general information about the study, including the advance work that Westat and NCHS completed prior to your joining the study staff. The remainder of this manual explains in detail your responsibilities in this study.

2. OPERATION OF THE ORAL HEALTH COMPONENT

2.1 Overview

This section summarizes the responsibilities of the dental examiner and dental recorder, before, during, and after the dental exams. Details will be provided throughout the remainder of this chapter and in subsequent chapters.

The sequence of events in the MEC will be:

- The dental examiner arrives at the MEC about 5 minutes before the exams are scheduled to begin. During that time he/she sets up his/her work area, equipment, and supplies.
- The coordinator checks in the SP at the reception area.
- The coordinator assembles an SP exam folder for each SP and distributes daily appointment schedules to all exam rooms.
- The examiner checks the daily appointment schedule and goes to the coordinator's station to meet the SP. The examiner brings the SP to the dental exam area.
- The recorder records the following information:
  - On the Control Record: The time the SP arrived at the dental exam area.
  - On the Dental Exam Log: The SP's name and ID and time of arrival at the dental exam area.
- The examiner asks the SP (or responsible adult) questions regarding medical exclusion, and responds to the SP's questions regarding medical exclusion.
- The examiner completes the visual tactile exam of the SP, as described in Chapter 5 and the recorder records the examiner's observations on the automated system or Dental Data Forms.
- If smears of mucosal lesions are taken, the examiner prepares the slides for shipping.
- The examiner completes the Report of Dental Exam Findings based on the examiner's decision as to when the SP should seek dental care.

- The recorder, with the help of the examiner, completes the appropriate sections of the Control Record and Dental Exam Log.
- The examiner or recorder escorts the SP back to the coordinator's station.
- The examiner and recorder edit recorded data.
- Each day after the examinations have been completed, the examiner cleans the dental exam work area and organizes supplies.
- When the exams are completed at a stand, the examiner inventories all supplies, and packs all equipment and supplies.
- The examiner mails appropriate reports and forms to Westat and/or NCHS.

2.2 Checking in SP at Coordinator's Station

Upon arrival at the MEC, each SP will check in with the coordinator whose work station will be just inside the MEC entrance. The coordinator will assemble an SP Exam Folder for each SP. The forms that will be placed inside the folder which pertain to the dental exam team include:

- A Control Record, clipped to the front cover of the folder.
- Labels for use on the Dental Log, Slide Transmittal Form, slides, hard copy forms and all referral letters.

2.3 Daily Appointment Schedule and Escorting SP to Exam Area

The dental examiner and recorder should check the Daily Appointment Schedule (Exhibit 2-1) which will provide information about the SP (name, ID, age, sex, race/ethnicity). The schedule will be hard copy (paper) and will be distributed by the coordinator before the exam session begins. The dental examiner is responsible for letting the coordinator know that he/she is free to perform an exam. The dental examiner or recorder should go to the coordinator's station and meet the SP. The coordinator will give the appropriate SP Examination Folder to the dental examiner. The examiner should make sure s/he has the correct folder. The recorder or dentist should help the SP into the dental chair, and say a few words to the SP to put him/her at ease.

Exhibit 2-1. Daily appointment schedule

THE DAILY APPOINTMENT SCHEDULE
NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY
DAILY APPOINTMENT SCHEDULE FOR STAND 998
FOR FRIDAY, FEBRUARY 12, 1988

APPT TIME RMKS	NCHS NUMBER	AGE/SEX /LANGUAGE	NAME	TRANS
08:15 AM	S 998 232 9	81 F E	HILDA SMITH	T
08:15 AM *	S 889 228 0	43 F E	JANE WILSON DATA RETRIEVAL: SCR	S
08:30 AM	U 998 488 7	2 F E	CYNTHIA BROWN	T
08:30 AM	S 998 300 7	74 M E	THOMAS S. STUART	T
08:30 AM	S 998 074 1	56 M E	LEWIS GREEN DATA RETRIEVAL: SP	S
08:30 AM	U 998 203 5	12 M S	PHILIP BRIGGS	T
08:30 AM *	S 998 189 6	28 F E	MABEL WINN	T
08:30 AM	S 998 446 1	35 M E	JAMES FOLEY	T

Certain information must be recorded by the recorder.

- On the Control Record, enter the time the SP arrived at the dental exam area.
- On the Dental Exam Log, enter the SP's name and ID and time of arrival at the dental exam area.

The Control Record will be discussed in detail in Attachment B, NHANES III Standard MEC Operations. The Dental Exam Log is described in Section 6.0, Oral Exam-related Forms and Procedures. Remember, all information will be recorded on the automated system, but hard copies for these two forms will also be used.

2.4 Responding to SPs' Questions

It is very important that the dental examiner answer questions raised by the SP's. Some of their concerns about the dental exam might be:

- **Treatment**. If the SP asks, assure him/her that the exam will not include treatment, x-rays, a drill, or anesthesia. The dentist will use only a mirror and dental hand instruments to examine the mouth.
- **Qualifications of the examiner**. The examiner is a licensed dentist.
- **Existing dental work**. The exam will not interfere with any existing dental work such as fillings, bridges, sealants, or orthodontic bands.
- **AIDS (Acquired Immune Deficiency Syndrome)**. The Centers for Disease Control, part of the Public Health Service, has set up standard practices (universal precautions) for dentists to use to prevent the spread of diseases, viruses, and bacteria, and these procedures are strictly observed by the dentists on this study. The dentist will wear sterile gloves and a mask, and the dental instruments will be sterilized before examinations are preformed. The precautions used in the survey are the same as those maintained in dental offices.

2.5 Exclusion for Medical Condition

SP's with certain medical conditions will not be permitted to participate in some components of the dental exam. The examiner must ask each SP or the SP's parent/guardian if the SP has any of the conditions listed on the automated system screens or the Medical Exclusion Questionnaire (to be used if the computer system is down). The responses to the medical exclusion questions determine which of the dental exam components can be performed.

Medical exclusion questions should be asked only of SPs aged 18 years or older. A responsible adult must answer the exclusion questions for SPs under 18 years of age. SPs between the ages of 12 and 17 years may provide answers to questions other than medical exclusion questions. A responsible adult must provide answers to all exam-related questions for SPs under 12 years of age.

The dental team then completes those components as specified in Chapter 5.

2.6 Conducting the Oral Exam and Recording Oral Exam Data

Procedures for conducting the oral exam and recording data are described in Chapter 5 of this manual. After determining what age-specific portions of the exam the SP can receive (that is, those portions not excluded for medical reasons), the dentist conducts the dental exam and the recorder enters data into the automated system.

2.6.1 Automated Computer System

In addition to all of the specialized medical and dental equipment needed for the physical and dental exams, the MEC contains an automated computer system. The automated system is used to:

- Direct the flow of SP's through the MEC, keeping track of which parts of the exam and interview have been completed.
- Record interview and exam data.

- Perform edits on collected data.

The dental examiner "calls" his/her observations (codes for oral health indices) during the oral exam, and the recorder records the information on the automated system. Even though the data are entered into the computer system, there is still paperwork to complete, such as the Report of Oral Exam Findings. A complete description of the automated system can be found in Chapter 4 and Attachment C of this manual.

2.6.2 Oral Data Forms (Back-up)

If the automated system malfunctions or fails, the recorder should record all of the exam findings on the Oral Data Forms. These forms, discussed in detail in Chapter 5, are used until the automated system problem is corrected. At that time, the dental examiner enters the data from the Data Forms into the automated system.

2.7 Editing and Quality Control

The dentist and recorder are both required to edit hard copy recording forms before the SP leaves the dental exam room. Editing includes checking forms for missing information, errors, and illegible writing. If information is missing, the dentist may need to reexamine an area of the mouth. The automated system has range and consistency checks built into the computer software so there is less need for editing of these data by the dentist.

2.8 Documenting Omitted Examinations and Recording Reasons That Portions of an Examination Were Not Done

If a scheduled exam is not done, the reason must be recorded on the Control Record, the Dental Exam Daily Log, and the Oral Health Exam Log called the Dental Questionnaire. This is also the case for partially completed examinations.

The NHANES III Dental Examination is a complex examination with many subcomponents. Not every SP receives every part. Usually, the main determinants of whether or not a person receives certain subcomponents are age and medical exclusion status. However, there are occasions when the SP in the MEC is prevented from receiving a dental exam, and occasions when the dental exam on an SP begins but must be terminated. Both medical exclusions, and these circumstances, are to be recorded on the Dentist's Exam form or in the automated system. Medical exclusions are recorded by a "yes" response to any of the medical conditions or circumstances on the Dentist's Exam form or the medical exclusions screen in the automated system.

Other reasons for terminating the exam or a subcomponent of the exam are to be recorded on the Dentist's Exam item 25 on the 2nd page of the form or on one of the final screens of the automated system. The exam could be terminated for one of the following reasons: a hardware problem or lack of supplies, insufficient time available, a room not available, examinee refused or uncooperative, for medical reasons, examinee unable to cooperate or "other" reasons. "Medical reasons" here means a circumstance where the examinee's safety or medical condition is of concern to the examiner. Examples include pain, fainting, seizure, bleeding. For example, if an SP has been excluded from subcomponents because of a medical exclusion, but has otherwise gone through the exam normally, this circumstance would be counted as a completed exam (and not a termination for medical reasons).

However, if the same SP experienced pain or fainted and the examiner elected not to complete certain exam portions, this would be treated as an aborted exam and "termination for medical reasons" would be checked. Examinees excluded from certain components due to age, but who otherwise have completed the examination procedures are considered to have complete exams, and item 25 need not be filled out. An "uncooperative" SP is one who is unwilling to cooperate, e.g., an infant or small child who cannot be persuaded to get through the exam. An examinee who is "unable to cooperate" is one who is willing but faces a physical or other barrier in complying with the protocol, e.g., a person who cannot sit in a position conducive to conducting the exam.

2.9 Dental Exam Daily Log

The Dental Daily Log is used to record the SPs examined in each session, and allows the examiner to record pertinent comments about the SP or exam. The logs are maintained by the examiner, and at the end of a stand are sent to Westat. A description of the log, and its use, and an exhibit of the log are provided in Section 6.1.

2.10 Report of Dental Exam Findings and Referral Letters (If Applicable)

Immediately after the exam, the dentist will complete a Report of Oral Exam Findings. This report will be handed to the SP and will indicate whether the SP should continue his/her usual dental care, see a dentist at his/her earliest convenience, see a dentist within two weeks, or see a dentist immediately. The report and related procedures will be discussed in depth in Chapter 6.

If it is necessary for an SP to see his/her dentist immediately or within two weeks, the dentist will have to prepare a referral letter to be sent to the SP's dentist and complete the dental contact log. These forms and procedures are discussed in Chapter 6 of the manual.

2.11 Returning SP to Coordinator's Area

After the exam data have been recorded and the dentist completes the Report of Dental Exam Findings, the examiner or recorder should return the SP to the coordinator's station and give the SP's Exam Folder to the coordinator. The examiner should check with the coordinator to see if another SP is waiting for the dental exam.

2.12 Packing and Sending Forms to Westat at the End of a Stand

Follow standard MEC procedures for packing and sending forms and data diskettes to Westat and NCHS. These procedures are discussed in Chapter 6 and in Attachment B to this manual.

3. EQUIPMENT AND SUPPLIES

3.1 Dental Exam Area in MEC

One room of the MEC has been designated for dental exams and contains all of the equipment and supplies needed for that component. The room is 4’ 8" by 6’ 10" and includes cabinets for storage, a counter top, and a sink with running water.

3.2 Description of Equipment and Supplies

Exhibit 3-1 shows a list of equipment and supplies, and the anticipated quantities for each of these items.

Before leaving for the field, the MEC will be loaded with all of the equipment necessary to perform the examinations for the study and the supplies needed for the first two stands. Westat will ship supplies to the field for later stands.

The dental examiner should inform the stand manager **immediately** if there is a problem with any dental equipment or supplies. Westat will arrange to have the equipment repaired or replaced, if necessary. The dentist must take an inventory of supplies at the beginning of each stand adding newly shipped items to the inventory list, and at the end of each stand, using the form generated by the computerized inventory system. These inventories are used to re-supply the dental exam room. If they are not done correctly, you will not have the necessary supplies for exams. The shipping of supplies will be coordinated with the MEC travel schedule.

3.3 Assembling and Maintaining Equipment

The next several pages provide detailed instructions for setting up the dental equipment. The directions may seem complicated at first, but they will be reviewed, demonstrated and practiced during the training sessions. The examiner has primary responsibility for setting up and taking down the dental equipment and supplies.

Exhibit 3-1. Equipment and supplies for dental component

		PER MEC	PER STAND	PER SP
Dental Porta-Chair		2		
Adjustable Deltube Stools (for examiner and recorder)		2		
Gomco air compressor (with air tips, hose, handles, foot pedal)		2		
Chemiclave with carrying case		2		
Chemipurge with case		1		
Rolux light, bulb, adapter		2		
Replacement bulb for Rolux light		1		
Extension cord (6 ft. for MEC, 25 ft. for hotel)		2		
3-way plug adapter		1		
Small pillow (for elderly)		1		
Hot pad mitt		1		
Funnel		1		
2-cup measuring cup		2		
Sharpening stone		1		
Bottle brush		1		
Heavy-duty re-usable gloves (kitchen-type) to clean instruments		1		
Spray bottle (for vitaphene) 8 oz. or 12 oz.		1		
Wash cloth				
Safety glasses (1 pair) plexiglass				
<u>Plastic Containers with Lids</u>				
Rectangular 5 cup (used instruments)		4		
Rectangular 5 cup (clean instruments)		5		
Round 3 quart bowl (hand washing)		1		
Round 1 cup (gauze)		2		
Round 2 cup (storage)		2		
Rectangular 7 cup (storage)		2		
Small cidex container (soak compressor tip)		1		
<u>Instruments</u>				
#23 explorer		60		
NIDR probe		60		
#17 explorer	per	40		
#3 explorer	year	40		
Currette		10		
Mirrors (handles and heads)		120		

Exhibit 3-1. Equipment and supplies for dental component (Continued)

	PER MEC	PER STAND	PER SP
For Chemiclave use			
Vapo-Sterile solution (gallon bottles)	29	1 gallon	
Tray liners (500/box)			
Harvey metal cleaner (pint bottle)		1/4 pint	
Spore test strips (need 1/week)		<6	1(+10%)
Chemiclave bags (200/box)			1(+10%)
Surgical latex gloves (100/box)			
Surgical masks (50/box) - Tie back		50	
- Molded		50	
Clemiclave polish		114 pints	
2x2 gauze, non sterile (200/pkge)		6 pkges	
Denture adhesive (Fasteeth, cream)		1/2-1 tube	
Headrest covers (for pillow for elderly) (500/box)		35	
Alcohol (gallon or pint)		1 pint	
Ivory soap (22 oz. bottle)		1/2-1 bottle	
Cidex (to soak compressor tip) (gallon)		1 1/2 gallons	
Vitaphene (wipe surfaces and soak instruments) (quart)		1 qt.	
Bactoshield (for handwashing) (16 oz. bottle)		1 bottle	
Hand cream		1 bottle	
Chemipurge			
Formaldehyde filter	1		
Inlet filter	1		
Supplies for Slides for Smears			
Distilled water		6 oz.	
Tongue depressors (500/box) (individually wrapped, if possible)		60	
Slides		60	
Slide containers		60	
Mailing labels		2	
Shippers for slides (styrofoam)		5	

Exhibit 3-1. Equipment and supplies for dental component (Continued)

Non-dental Supplies Used in Dental Component

Diskettes, formatted DS-HD (high density)	
Stacking shelves (for paperwork)	
for 8 1/2 x 11 paper	-2 pairs
legal size	-2 pairs
Scissors	
Masking tape	
Scotch tape	
Duct tape	
Cleaning supplies:	409
	soft scrub (scouring)
	Windex
	Lysol air freshener
Pens	
Tissues	
Paper towel:	inexpensive rough (clean counter)
	better quality (hands)
Waste basket (biohazard)	
Trash bags	
Bubble envelopes for shipping	
Eyedropper for distilled water	
Penlight and batteries	
Clock	
Scrub sponge	
Clipboard	

3.3.1 Porta-Chair

The Porta-Chair is the chair in which the SP will sit during the dental examination. Exhibit 3-2 shows the steps used in setting up the Porta-Chair.

Be extremely careful when attaching the light post to the chair. Do not overtighten the plastic screws or the plastic will break in the socket. When packing the dental chair in the case, be sure that the socket and screw that hold the light post are not supporting the entire weight of the chair. The chair must be placed on its side when raising, collapsing, or adjusting the legs. Raising, collapsing or adjusting the chair while it is upright could result in severe injury to the hands and wrists.

3.3.2 Dental Stool

Since the examinations will be conducted with the examiner seated, the stool must be positioned next to the Porta-Chair. The dental stool can be raised to a comfortable height by using the release lever under the seat. The stool is also equipped with a backrest that can be added for additional comfort.

3.3.3 Rolux Light

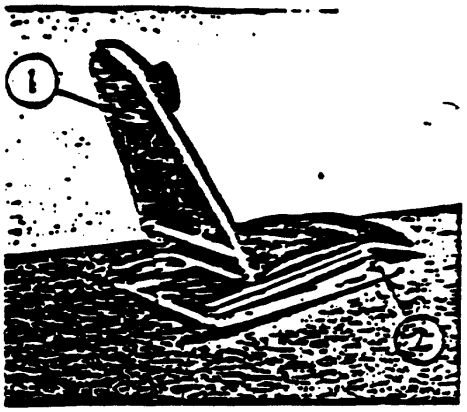
The portable light is preassembled and needs only to be connected to the chair and plugged into an electrical outlet. A chair adapter will accompany the light. Mount the adapter securely to the chair and make certain that the adapter is **level** and **horizontal** to the floor. After tightening the bolts on the adapter, check again to be sure that the adapter is level.

The chair mount Rolux Light comes assembled with a horizontal supporting arm and a bushing designed for the light post. After unpacking, the male plug extending past the bushing is connected to the female receptacle in the light post and then the Rolux Light is lowered to the light post until the bushing properly seats in the light post. Connect the power cord.

Exhibit 3.2. Steps used in setting up the porta-chair.

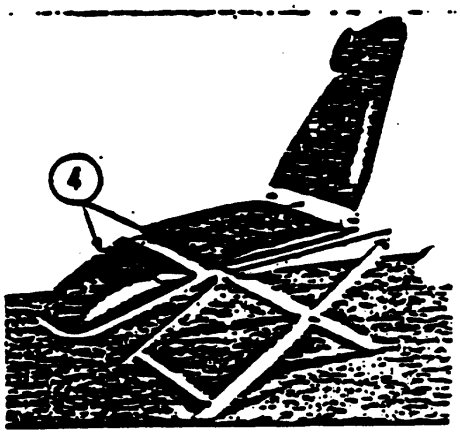
1. Connect adjustable back support with attached quick release pin.

2. Loosen height adjustment knobs. (Place the chair on its side when making adjustments, as described in Section 3.3.1)



3. Place right foot on bottom portion of right chair leg.

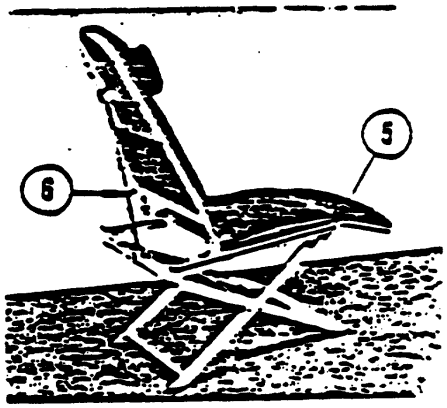
4. Raise top board of chair with left hand while lifting chair leg with height adjustment knobs up into slots on chair frame.



5. Tighten height adjustment knobs securely before using chair.

6. Adjust chair back to desired position. Push back forward to raise; pull adjusting knob out to lower.

7. Fold chair by reversing above steps.



The Rolux Light is equipped with two intensity control systems. The infinitely variable selection switch regulates intensity from off to maximum illumination. The lens system located at the end of the arm regulates focus from a wider to a narrower light beam. As the beam is narrowed, the light energy is concentrated for greater illumination. A few minutes of experimentation will establish the optimum intensity and focus for each operator. To ensure maximum lamp life, the minimum intensity position should not be left on all day but used only for short durations when needed during an exam.

The Rolux light is designed to minimize the need to reposition patients for the dental procedures. The light is equipped with a fully flexible arm which may be moved freely to eliminate shadows and to illuminate areas impossible to illuminate with conventional lights. The optimum distance from the light lens to the operating area is 8-12 inches. Certain dental procedures may require higher light intensity which can be accomplished, in part, by moving the light lens to within four inches of the operating area.

Correct adjustment is accomplished when all arm angles are about equal. **Do not bend the arm more than 90º at any flexible joint**, or broken glass fibers may result in reduction of light transmission.

To replace the high-intensity light bulb, turn the light off, remove the cover by loosening the two thumb screws, and slide the cover off. To remove the bulb, push the lever on the lamp socket forward, and the bulb will eject. Place a new light bulb in the socket slots and push all the way to the bottom of the slots for proper electrical contact. Replace the cover and tighten the thumb screws.

Remember: The arm of the light is made of glass fibers which transmit the light. If the fibers are broken, there will be less light transmission. For this reason, care must be taken with the light. Be sure to keep the original Rolux light box and the packing materials. At the end of a stand, the light must be packed in the special Rolux light cardboard box, and the arm must be wrapped in styrofoam. Each MEC will have an extra Rolux light and extra light bulbs.

3.3.4 Gomco Air Compressor

Exhibit 3-3 shows diagrams of the Gomco Air Compressor.

- **Operating Principle**

  The negative and positive pressures of a diaphragm pump are developed by the reciprocating motion of the diaphragm inside the pump head. These pressures are maintained by the motion of the diaphragm and the pressure and suction flapper valves. On the up stroke, the pressure valve will open to allow air to flow through to the exhaust or pressure port. On the down stroke, the pressure valve closes and the suction valve opens which draws a vacuum or creates a negative pressure at the suction side.

- **Assembly**

  The Gomco Air Compressor is used only for air drying the mouth and not for suction, therefore only three assembly items are applicable.

  1. The black cord tubing for blowing air will already be attached to the air pressure valve and does not need to be removed when moving the equipment.

  2. Check all tubing to make sure that connections are secure.

  3. Plug the electrical cord into a three-pronged outlet. If the outlet is two-pronged, use a three-pronged adapter.

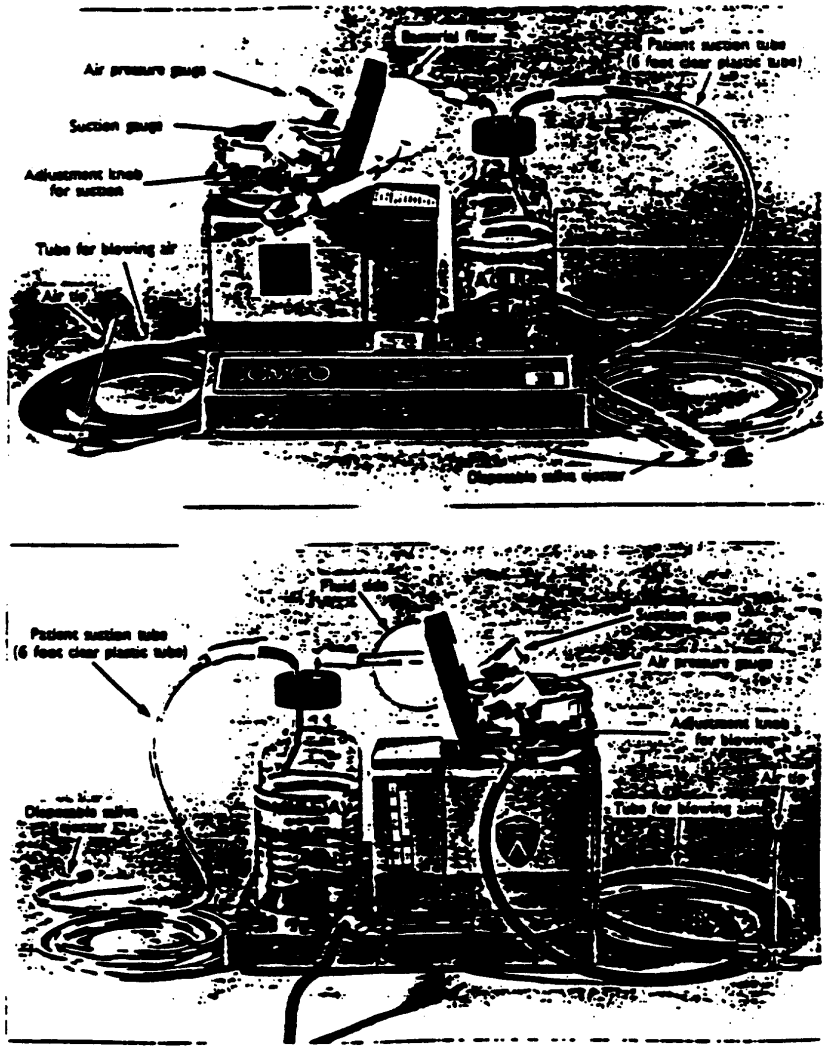
- **Safety Overflow Valve**

  The valve operates on the principle that a chamois disc permits the flow of air through it when dry. Any fluid striking and saturating the chamois causes the pores to swell and, thereby, stops the passage of air. When the chamois becomes moist (restricting the air flow), the vacuum of the pump causes the chamois to push against the formed spring which shuts off the air flow through the pump. The unit may be used without a chamois disc in emergencies, but there will be no overflow protection.

  When the valve closes, the pump should immediately be shut off and the felt filter and chamois disc replaced.

  The felt filter is replaced into the head of the safety overflow valve to collect any moisture droplets that may get drawn into the intake tube.

Exhibit 3-3. Gomco air compressor



- **To Replace the Felt Filter**

1. Shut off pump.
2. Remove cover on valve back.
3. Take out three screws and filter window.
4. Remove gasket.
5. Remove felt filter and discard.
6. Wipe clean and dry all parts.
7. Put in new filter and attach gasket and window making sure that the window is tight.

- **To Replace Chamois Disc**

1. Remove cover of valve while pump is running.
2. With chamois removed and spring in closed position, wipe out the moisture from valve back.
3. Shut off pump and note that the spring releases from valve back.
4. Press spring to back of valve and remove any moisture in lower portion of valve back.
5. Start pump and note that the spring will remain open permitting air to enter pump.
6. Gently insert new chamois in place of the old one with pump running and fasten on overflow valve cover.
7. Remove moisture from vacuum regulating valve and tubing attached to overflow valve.
8. Attach tubing from short bottle tube to valve and check to make sure suction is present. NOTE: The valve function should be checked in the collection bottle and in the vacuum system or premature shutoff may occur.

If the valve closes after reassembly when the motor is running, this is an indication that moisture may be reaching the chamois disc. The valve should be disassembled and dried more thoroughly or replaced. Replace chamois disc. There is a chance that the valve may close by itself if the tubing is compressed and released suddenly--stop the pump for three seconds and it will reopen.

If no moisture is reaching the valve and it still closes, the difficulty may be that the spring has been bent in a convex condition or the legs of the spring may have been bent too flat. Should this condition occur, the spring must be replaced. Refer servicing to qualified personnel.

CAUTION: If flooding occurs, do not attempt to operate the pump. Refer servicing to qualified personnel. Do not at any time lubricate any of the parts with oil, grease, or petroleum products. The pump and motor are permanently lubricated and require no oiling or greasing.

3.4 Infection Control Procedures

All mirrors, explorers, probes, and scalers must be sterilized after being used and kept sterilized prior to usage. When the home office sends new instruments, they must be sterilized prior to their first use. Having a sufficient number of sterilized instruments available for each examination session is the responsibility of the dental examiner. The dentist must wear heavy duty household gloves whenever handling used instruments. The recorder will not help with cleaning, sterilizing, or handling used instruments.

Used instruments will be sterilized with a portable Chemiclave, which includes a Chemipurge unit, in the MEC. Instruments can be sterilized before or after the exam sessions. If the Chemiclave is not working properly, the dentist must inform the stand manager immediately and, if necessary, Westat will ship a replacement Chemiclave to the field. Since each MEC is supplied with two Chemiclaves, one should always be operational. However, in the event an emergency arises, the examiner can use the Cidex solution for cold sterilization of the instruments, following the instructions on the Cidex bottle.

The infection control procedures described in this section for handling and sterilizing instruments and maintaining a safe examination environment are in compliance with regulations and recommendations of the Centers for Disease Control, U.S. Public Health Service and National Institute

of Occupational Safety an Health.

3.4.1 Examination Environment

The dentist sets up and organizes the dental equipment at the beginning of each stand. Instruments and supplies must be prepared and arranged for examinations daily.

General guidelines for maintaining safety and efficiency in the dental examination room:

1. Equipment is arranged so that SPs can move easily and safely into and out of the room.

2. Electric cords must be under or behind the dental chair.

3. Chemiclave and Chemipurge are set up so as not to interfere with dental examinations.

4. Disinfecting solutions and other liquids must be covered and out of reach from curious SPs, particularly children.

5. The dental examination room must be kept clean and well ventilated.

6. The instrument sterilization packets are impervious to fluids, and therefore should be opened and placed in such a position that the packet becomes the instrument tray for the SP on which they are used.

7. Used instrument containers (one for mirrors and one for other instruments) are placed in an area away from the immediate examination area.

8. The hazardous waste container lid must always be in down position except when depositing wastes.

Attachment "A" presents infection control practices recommended for dentistry by the Public Health Service. The dentist is responsible for ensuring proper infection control practices in the dental examination room.

Counter tops must be disinfected with an appropriate solution before arranging the instruments and supplies for daily use. (Refer to Attachment "A".)* The examiner must wear a face mask and a new pair of sterile gloves for each SP examination. If the examiner adjusts the dental stool or the mask or touches any object, other than one that has been disinfected during an examination, s/he must rescrub and put on a new pair of gloves. Examiners and recorders must wear neat and clean lab jackets or gowns in the MEC. Only properly sterilized instruments are to be used for dental examinations (refer to Section 3.4).

Sequence of procedures for maintaining infection control between SP examinations is as follows:

1. After completing an examination, used instruments must be deposited in used instrument containers partially filled with a 1:32 solution of Vitaphene.*

2. The instrument sterilization packet that was used as an instrument tray should be folded and thrown in the hazardous waste container with the paper towels from the counter top.

3. Gloves should be turned inside out as they are removed, and thrown into the hazardous waste container.

4. Clean the headrest area of the chair and then use an appropriate disinfecting solution on the Rolux light. If the air tip is used during the examination, a high level disinfection method must be used. Disinfect the counter top again before placing new instruments on it (Refer to Attachment "A.").*

5. Hands must be washed with soap and water or an appropriate hand washing preparation, and regloved.

6. Place fresh paper towels on the counter top and open a new instrument packet. Fold the clear waterproof cover under the backing of the packet, and place it in such a position that it can be used as a tray for the instruments it contained. After using instruments either return them to the instrument packet tray or place them in the used instrument container.

3.4.2 Chemiclave

*The dentist may use his/her professional judgment in choosing appropriate substitutes for solutions suggested in Attachment "A."

The following instructions for operating and caring for the Chemiclave are directed toward the dentist.

I. Storage and Handling of Used Instruments

A. Used instruments should be handled carefully to prevent transfer of microorganisms from the patient to the dental professional.

B. Immediately after instruments have been used, place them in a plastic container containing 1:32 Vitaphene solution. Keep the instruments in solution until you are ready to sterilize them.

C. Instruments must be rinsed and completely dried before they are placed in the Chemiclave; otherwise, the instruments will be damaged during the sterilization process.

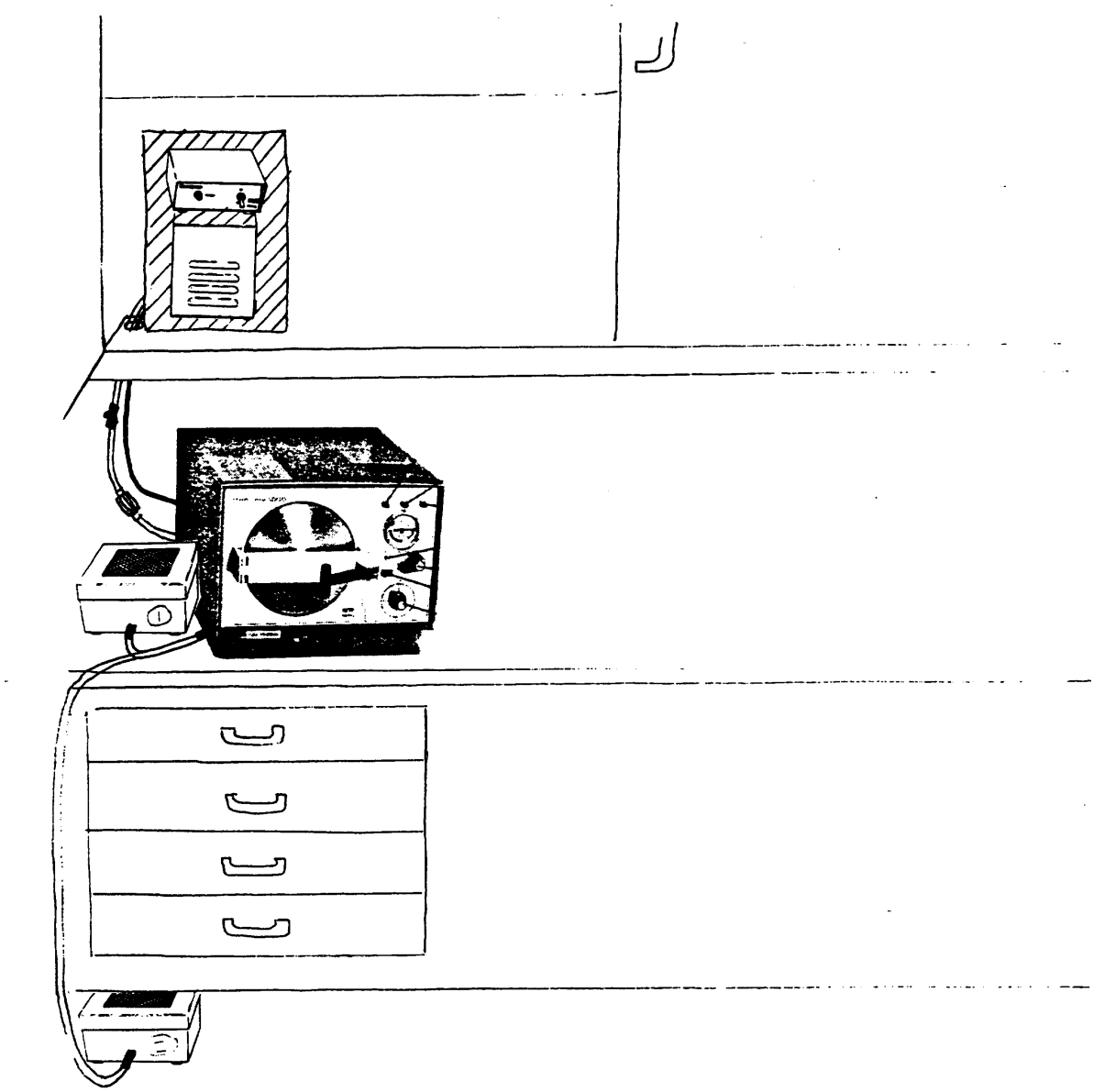
II. Set up Chemipurge Unit

The Chemipurge contains motor and switch units that are encased in a sponge insulated box and fitted into the lower left corner of the cabinet. Printed instructions for the use of the Chemipurge have been placed in the front of the motor unit.

In the far corner of the counter a hole has been created to route the electrical cord and plastic tubing for the units. A quick release has been installed in the tubing to connect it to the Chemiclave. An electrical outlet is located behind the Chemiclave.

The filter box attaches to the outlet vent tube on the lower left side of the Chemiclave. It can either be placed on the counter with the short tube on the floor or on the floor with the larger tubing. If the longer tube is used, the condensation fluid will accumulate in the bottom of the vent box and will need to be removed regularly. The manufacturer recommends use of the shorter tube to prevent formation of condensation but since counter space is limited the floor placement and longer tube has been adopted. The unit set up is shown in Exhibit 3-4.

Exhibit 3-4. Chemipurge unit setup



Both the formaldehyde and inlet filters need to be replaced every year. The date of replacement should be marked with a magic marker on each filter. It is important that the inlet filter be installed between the quick release and the Chemiclave.

III. Activate Chemiclave

A. Connect Chemiclave to 115 volt outlet.

B. Close door but do not lock.

C. Turn power switch to "on" position.

IV. Check Solution Level

A. The solution light will come on if inadequate solution is in the reservoir to complete a cycle.

B. If solution light is on, remove the dust cover and add Vapo-Sterile Solution with the furnished measuring cup until the solution light goes out. Replace dust cover.

C. **Do Not** use anything other than fresh, undiluted Vapo-Sterile Solution in the reservoir.

D. If the solution light comes on during the sterilizing process, additional solution should be added to the reservoir.

V. Prepare Instruments for Sterilization

A. Remove the instruments from the Vitaphene solution and scrub with a brush and dish soap to remove any remaining blood or debris. Be careful to prevent cutting your hands while scrubbing contaminated instruments.

B. Rinse instruments thoroughly to remove all foreign debris and soap.

C. Dry instruments. Instruments must be **completely** dry to ensure proper sterilization and to prevent rust or corrosion. (If instruments are not dry when placed in chamber, water vapor will increase the relative humidity in the chamber which in turn will increase the pressure. As a result of the increased pressure, the relief valve will open. If the relief valve opens, allow all pressure to dissipate by turning the control knob to "Depressurize", dry the instruments and begin cycle again.)

D. Place instruments in Chemiclave.

Self-seal paper bags for sterilizing the instruments in the Chemiclave will be used. Place one set of instruments per bag and be sure to place the mirror at opposite end of the bag so that pointed instruments will not scratch the mirror head. The dentist should be aware of the schedule each day and prepare exam packets accordingly. By using this procedure you will keep sets of instruments sterile and can open bags of instruments as needed for the next day's examinations. Gloves must be worn when handling sterilized instruments.

E. Fill Instrument Tray

A. Place paper tray liner on tray. **Do Not** use paper towels instead of tray liners.

B. Several bags of instruments are going to be sterilized at once. Place bags on the tray. The paper bag changes color from blue to green to indicate that the sterilization process has been completed.

VI. Sterilize

The Chemiclave must **never** be left unattended while sterilization is in progress.

A. When the "temperature" light goes out initially the Chemiclave is ready for use.

B. Place lined tray and instruments in instrument bags in chamber.

C. Close and latch door. (If the gasket should become stretched so that the door does not close tightly, use the wrench end of the tray handle to give the nut on the door handle a 1/4" turn clockwise.

D. Turn control knob to "Pressurize" by moving dial from a 2 o'clock to a 10 o'clock position.

E. The timer will automatically begin when the chamber reaches 20 psi.

F. After 20 minutes of 20 psi a buzzer will sound for 10 seconds and the "sterile" light will come on.

G. Immediately after the buzzer sounds and the "sterile" light comes on, turn the control knob to "Depressurize." Wait until the pressure gauge indicates "0" pressure.

H. Proceed with Chemipurge operations.

VII. Chemipurge Operation

The Chemipurge purges the Chemiclave chamber of substantially all residual chemical vapors following the sterilization cycle. Perform the following steps carefully, and do not operate the Chemipurge when the Chemiclave is under pressure:

1. Operate the Chemiclave through the normal sterilization cycle. (See Section VI, steps A-H.)

2. Make sure the Chemiclave is depressurized and the gauge indicates "0".

3. Turn on the Chemipurge control switch and let it run for five minutes as specified for the Chemiclave 5000 in the Chemiclave Operations Manual.

4. After five minutes, turn off the Chemipurge Control Switch and wait until the pressure gauge again indicates "0" pressure.

5. The Chemipurge cycle is complete and instruments may be removed.

Chemipurge operation instructions are posted on the motor unit.

VIII. Complete the Cycle

A. Open door partially for 15 seconds, then open fully.

B. Remove contents using tray handle and hot pad mitt to prevent burns.

C. **Do Not** leave instrument or tray in chamber after sterilization is complete to prevent paper from smoldering.

IX. Maintenance

A. Turn unit on for about two minutes to allow chamber to get warm. Use Harvey Metal Cleaner on a plastic sponge to clean the interior of the chamber, chamber door, and instrument tray at least once per week. Wipe these areas dry with a towel. Use a small amount of vapo solution on a piece of cloth to go over all areas where Harvey Metal Cleaner was used in order to remove any residue. Clean chamber and tray more often if debris or stains **begin** to form. Be certain that the portion of the chamber door which occludes with the gasket is clean at all times to permit proper seal. Clean exterior of

Chemiclave using water and dish soap as needed.

B. Drain the Chemiclave system once per week by attaching the plastic tubing to the condensate valve. Turn the eccentric knob to open the valve and allow the solution to drain into a cup for disposal. (If the Chemiclave is not drained weekly, solution will leak out through the escape valve.)

C. Tighten chamber door, as needed, by turning the nut on the door handle a 1/4" turn clockwise.

D. Transport with door closed but not locked.

X. Repair

A. If the Chemiclave needs repair, inform the MEC manager immediately.

3.4.3 Spore Tests

The dental examiner must check the Chemiclave **weekly** using spore test strips. The dentist will be supplied with envelopes, each of which contain three spore test strips and a card. The following procedures are addressed to the dentist.

- Remove two spore strips from the envelope and place them in the Chemiclave chamber along with the instrument bags. Leave the third spore strip with the envelope; this is the control.

- After the Chemiclave cycle has run, place the two spore strips in the envelope with the control strip.

- Each spore test envelope contains a card which should be filled out to let the laboratory know where to send the results of the spore test analysis. On the card, write the following name and address where the results should be sent:

  Ms. Catherine Novak
  Westat, Inc.
  1650 Research Blvd.
  Rockville, MD 20850

- Make certain the Chemiclave Serial Number is entered.

- The examiner's name should be listed as the operator.
- The account number is Westat's telephone number 301/251-1500.
- On the outside back of the envelope, write the examiner's ID number which will be assigned during training **and** the identification number which is on the Chemiclave.
- Mail the envelopes. The envelopes are self-addressed and will be sent directly to a lab for analysis.

3.5 Replacing Instruments

Each MEC will be equipped with 50 sets of instruments. The examiner will use about 20 sets each day for 20 SP exams.

Since mirrors become scratched and explorers and probes become worn over time, defective instruments will be replaced regularly during the field period. Number 17 explorers, Number 3 explorers, scalers and mirror handles are not replaced during the study unless the need arises. Number 23 explorers and mirror heads are replaced every 15 weeks. Perioprobes are replaced every 30 weeks.

Stands will operate for a duration of 6-8 weeks, and the dentist may be in a different MEC for the next stand. For these reasons all MEC dentists must follow procedures for keeping track of instrument replacement dates. The procedures are as follows:

1. Dentists in the first stands will receive new instruments. Calendars will also be provided with the dental supplies. The dentists in the first stands must calculate the date 15 weeks in advance of the first MEC operating day and circle the replacement date on the calendar. At the end of the first stand, the calendar will be packed in the box with the instruments. The dentists at the second stand will then know the replacement date for the instruments. Additionally, the MEC manager will be giving dentists an inventory list to be filled out at the end of each stand. The next replacement date for the instruments must also be recorded on the inventory lists.

2. The calendar and instruments will remain in the dental examination room as the MEC is moved from stand to stand. Dentists at the second, third, etc., stands must note the circled date on the calendar and make sure that old instruments are thrown away and replaced with new ones on that date. Although provisions will be made to automatically ship the new instruments to you before the fifteenth week, DO NOT THROW AWAY THE OLD

INSTRUMENTS UNTIL YOU HAVE RECEIVED AND UNPACKED THE NEW SHIPMENT OF INSTRUMENTS. If you have not received the new shipment by five working days before the circled date, inform the MEC manager.

Examiners should inspect instruments, equipment, and supplies daily. Unusable instruments and supplies, such as scratched mirrors, should be discarded. Instruments must be sterilized and the pointed edges carefully wrapped prior to disposal.

If any instruments need to be replaced between the automatic shipment dates, new instruments can be ordered by using standard MEC procedures. When the automatic shipment of new instruments arrives, the replacement instruments that were being used in the interim must still be discarded with the old instruments.

3.6 Packing Equipment and Supplies at End of a Stand

Equipment and supplies must be packed at the end of examinations at the completed stand before the MEC moves to the next stand. Since the MEC will be moving both short and long distances, you must become accustomed to packing and securing the equipment. Even if the MEC is moving only a relatively short distance, all of the equipment and supplies must be packed as if the MEC were moving a long distance.

The light bulb must be removed from the Rolux light, and the Rolux light must be removed from the dental chair and packed in the carrying case. The mirrors must be packed carefully so that they do not shift and break during the move. Instruments should be kept in the Chemiclave bags and the bags should be wrapped carefully before packing them in a box. In the same box with the instruments, be sure to pack the calendar showing the replacement date for instruments. Use newspapers to fill up empty space in the boxes so that items will not shift in the boxes. Nothing should be left in the cabinets during the move.

When packing for travel, do not stack boxes on top of one another because they may shift and fall over during the move. The Chemiclave and Chemipurge must be placed in a corner on the floor of the MEC to prevent sliding during the move.

3.7 Setting up Equipment and Maintaining the Examination Environment

The dentist arrives at the MEC several days before SP examinations are scheduled to begin. These days are spent unpacking, setting up, organizing equipment and supplies, and participating in the dry run to make sure the equipment is working properly.

Each day, the dentist should arrive at the MEC 5 minutes before the dental examinations are scheduled to begin. The examiner should stop by the coordinator's station to notify him/her of arrival.

Follow these guidelines when setting up the dental work area:

- Set up the dental chair and the equipment so that an electrical outlet is accessible.
- Set up the Chemiclave and Chemipurge so they are not in the way during the exams.

Set up the equipment and supplies in a manner that is reasonably efficient and safe, using the following guidelines:

- Set up the equipment so that people can easily move into and out of the room.
- Keep Cidex, Vitaphene, Biocide bottles, and used instruments out of the reach of curious SPs, particularly children.
- The examiner should swing the Rolux light to the side before the SP gets out of the dental chair so that the SP will not bump the light.

Supplies, such as sterilized packets of instruments, 2x2 gauze, disinfecting solutions, and paper towels, must also be set up before examinations begin each day. These items should be arranged so that they are easily accessible to the examiner. After disinfecting the countertop/table, the sterilized instruments, gauze and towels should be arranged for maximum efficiency and safety. Instrument packets for each SP must be opened and placed in such a position that the packet becomes the instrument tray for the SP on which the instruments are used. Used instruments are never placed in any area of the exam environment other than the opened packet from which they were taken. Two plastic containers in which

to put the used instruments must be placed out of the examination environment. Used mirrors should be placed in one plastic container and used explorers, probes, and scalers in the other container. Other instruments must not be placed with the mirrors because they may scratch the mirrors. A waste basket with a biohazardous waste liner must be available for used gauze, tissues, and paper towels. The handwashing basin with a solution of chlorhexidine-gluchonate should be placed so that no one can bump it when getting into or out of the dental chair.

The sequence for maintaining infection control between SPs is as follows:

1. After completing an examination, used instruments are placed in used instrument containers. The used containers should be partly filled with a 1:32 dilution of Vitaphene.

2. The tray cover is folded and thrown into waste.

3. The gloves used in the previous exam are turned inside-out as they are removed, and thrown into biohazardous waste container.

4. The headrest cover is removed and/or the headrest is cleaned. The Rolux light is disinfected using gauze soaked in Biocide.[**] If the air tip is used during the examination, a high level disinfection method should be used to clean the air tip.

5. The hands are washed in a handwashing solution of chlorhexidine (or soap and gluconate water in the exam room sink) and regloved.

6. The new instrument packet is opened, the waterproof clear cover of the packet is folded under the backing of the packet and it is placed on the countertop in such a position that it can serve as a tray for the instruments it contained. After use, instruments are either returned to the tray or put into the used instrument container.

[*]The dentist may use his/her professional judgment in choosing a substitute for the clorox solution. (Refer to Attachment A, Infection Control).

4. INTRODUCTION TO THE MEC AUTOMATION SYSTEM

4.1 Background

The purpose of the MEC Automation System is to provide a means for entering the data collected for NHANES III with the primary goal of improving the timeliness and quality of the data. The system has been designed to make data collection and manipulation an easy and reliable process.

The system is composed of hardware, which are tangible pieces of equipment, and software, which are the communication systems and management systems that run on the hardware.

4.1.1 The MEC Automation System Hardware

The MEC automation system hardware is provided and serviced by Digital Equipment Corporation (DEC), and consists of two industrial MicroVAX computers running VMS (a DEC operating system) and ORACLE, VAXmates running MS-DOS and DECNET-DOS, and VT320 terminals and printers connected to the MicroVAX computers through terminal servers and an Ethernet network. Figure 4-1 illustrates the MEC automation system configuration. As you can see from Figure 4-1, the oral health exam is only one component of the automated system.

The Data Terminal. Two types of data terminals are used on the MEC, the VT320 which is known as a "dumb" terminal and the VAXmate that is known as a "smart" terminal. The VT320 (Figure 4-2) has two components: a cathode ray tube (CRT), commonly called a video screen or monitor, and a keyboard. It is connected to the MicroVAX through a computer that is called a terminal server. The VAXmate (Figure 4-3) has a monitor, a keyboard, and a floppy disk drive. It is a personal computer that is directly connected to the MicroVAX. The main difference between the two types of terminals is that the VAXmate is a computer that can function and run software programs independently of the MicroVAX, including a program that directs the VAXmate to emulate (function like) a VT320. The program for the oral health component runs on a VAXmate in the dentist’s room on the MEC.

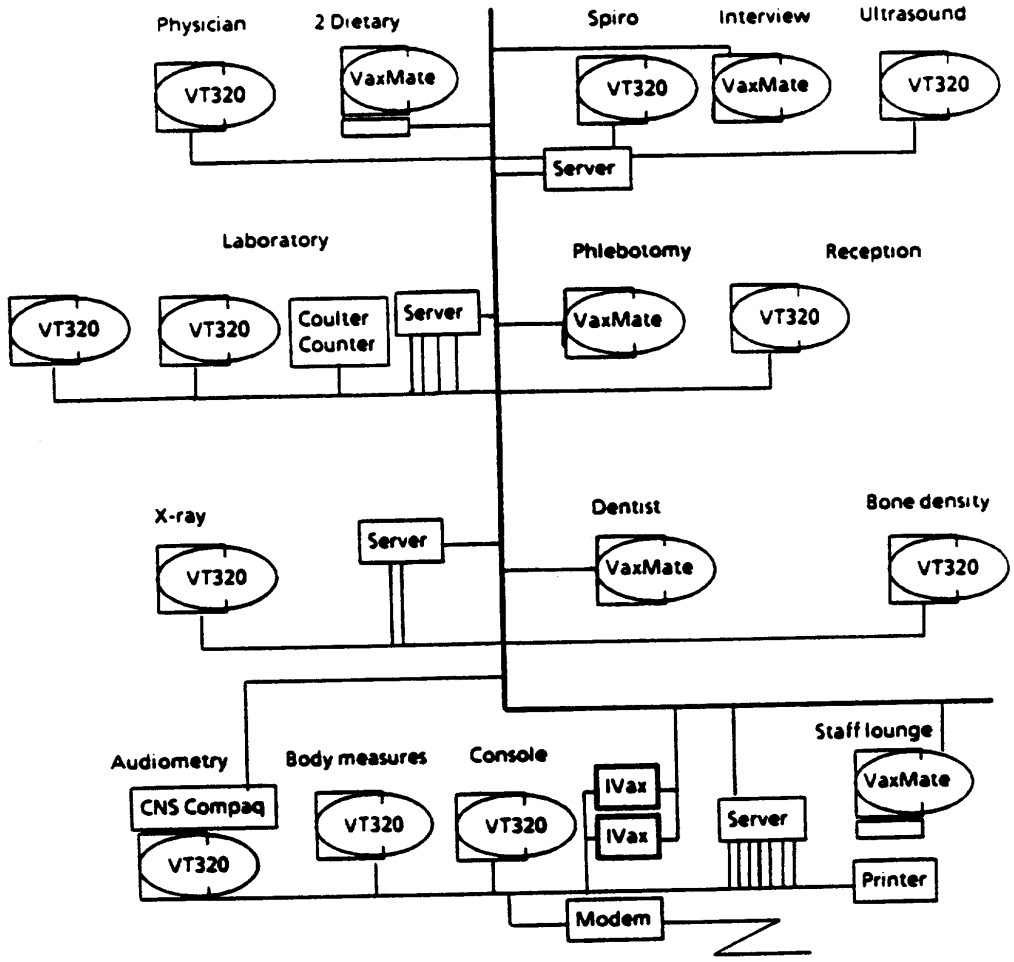


Figure 4-1. The MEC automation system configuration

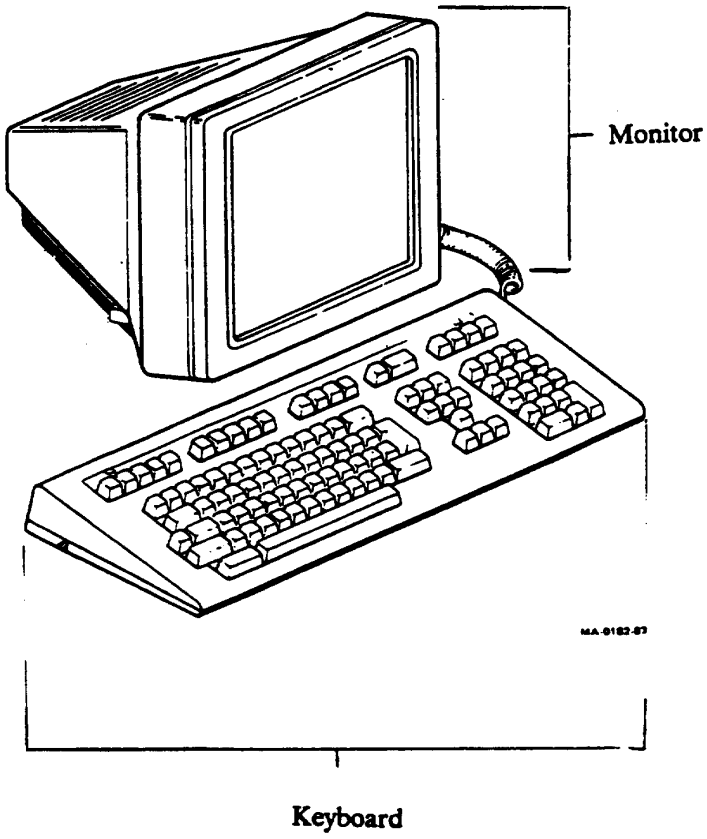


Figure 4-2. The VT320 terminal

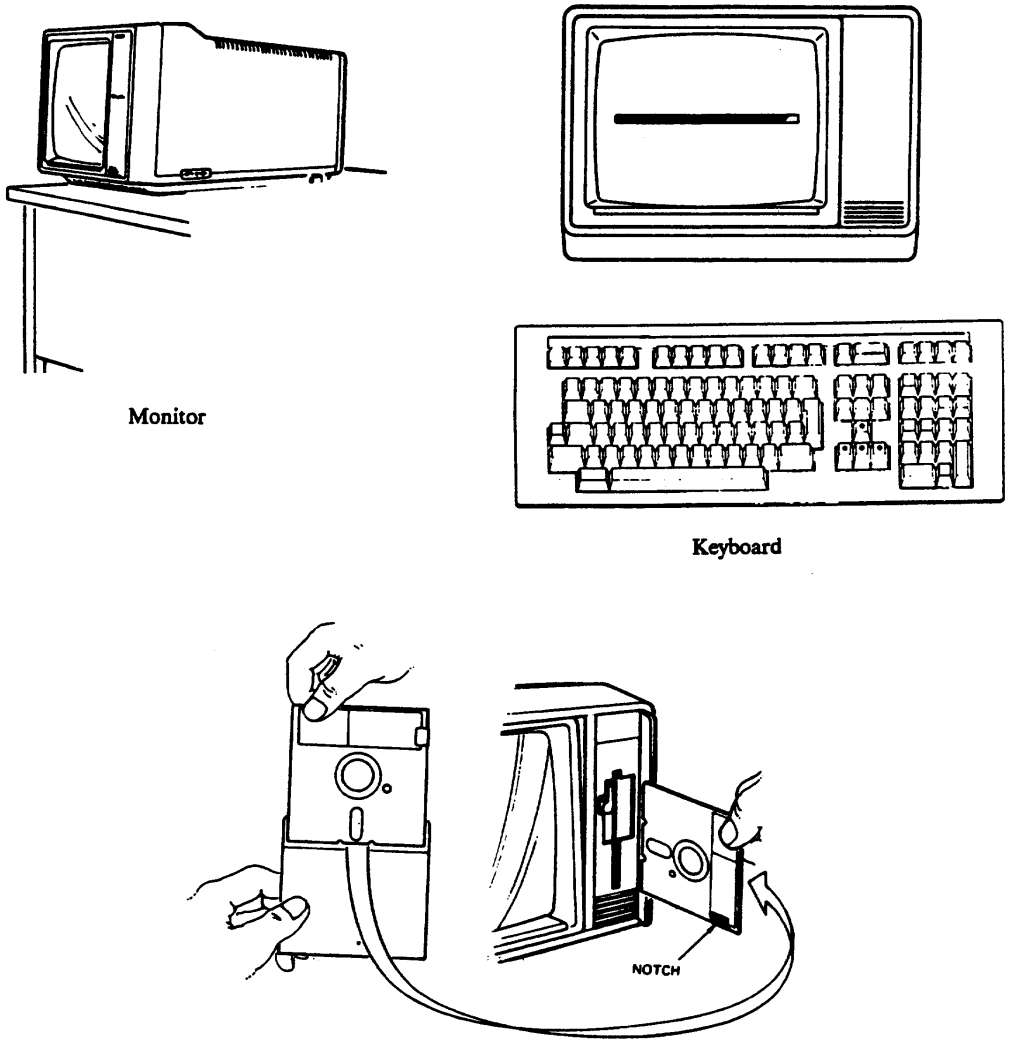


Figure 4-3. The VAXmate terminal

Description of the Keyboard. The keyboard (Figure 4-4) for the data terminal has four groups of keys, four indicator lights, and two audible indicators. The keys are grouped by function (see Figure 4-5).

- Main keypad,
- Editing keypad,
- Numeric keypad, and
- Top-row function keys.

Throughout this manual, references to specific keys are enclosed in angle brackets (< >).

The main keypad is similar to a standard typewriter keyboard. The alpha and numeric keys are used to type letters and numbers. The editing keypad has six editing keys and four arrow keys. Pressing an arrow key moves the cursor in the direction of the arrow. The keys of the numeric keypad are used to enter any numeric data, such as coded questionnaire responses or examination results or an examinee's identification number or age.

Every stroke of a terminal key creates a specific electronic signal to be transmitted to the computer. For this reason, alpha and numeric keys cannot be used interchangeably and a space cannot be used indiscriminately. For example, the USER cannot type "l" (the letter l) in place of "1" (one) and vice versa. If a key is inadvertently pressed which sends an invalid signal to the system, the system is programmed to reject the signal and to display an error message on the terminal screen.

The keyboard has four indicator lights (see Figure 4-4), which should always be off. If <Hold Screen> is inadvertently pressed during a session at the terminal, the Hold Screen indicator light turns on and the display on the screen is frozen. Pressing <Hold Screen> again releases the screen and turns off the Hold Screen indicator light.

The keyboard has two audible indicators, a key click and a bell. The key click is the clicking sound that is heard when a key is pressed. The warning bell sounds whenever the USER receives an error message.

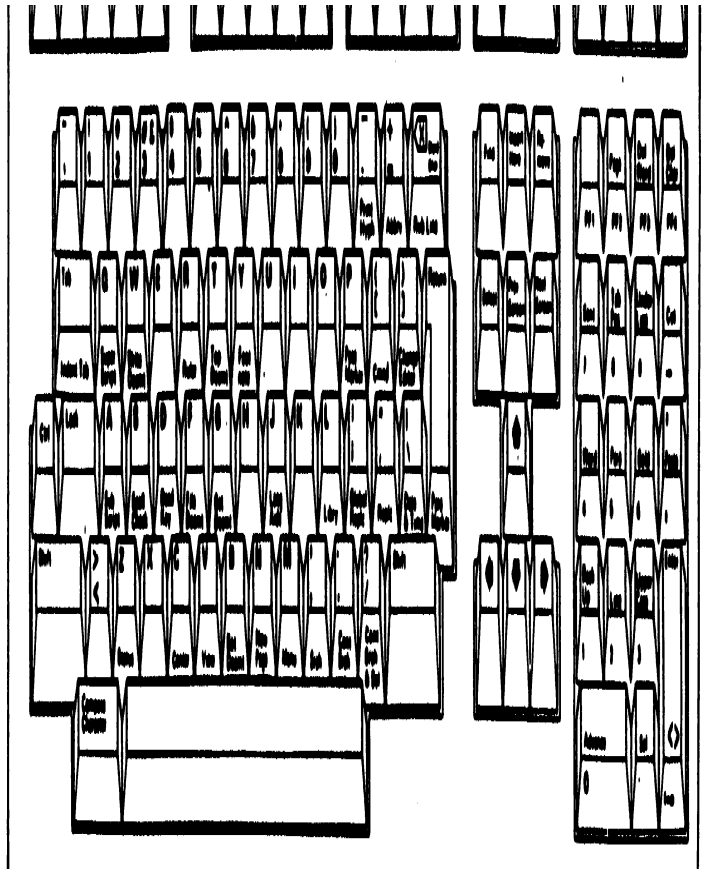


Figure 4-4. The keyboard for the data terminal

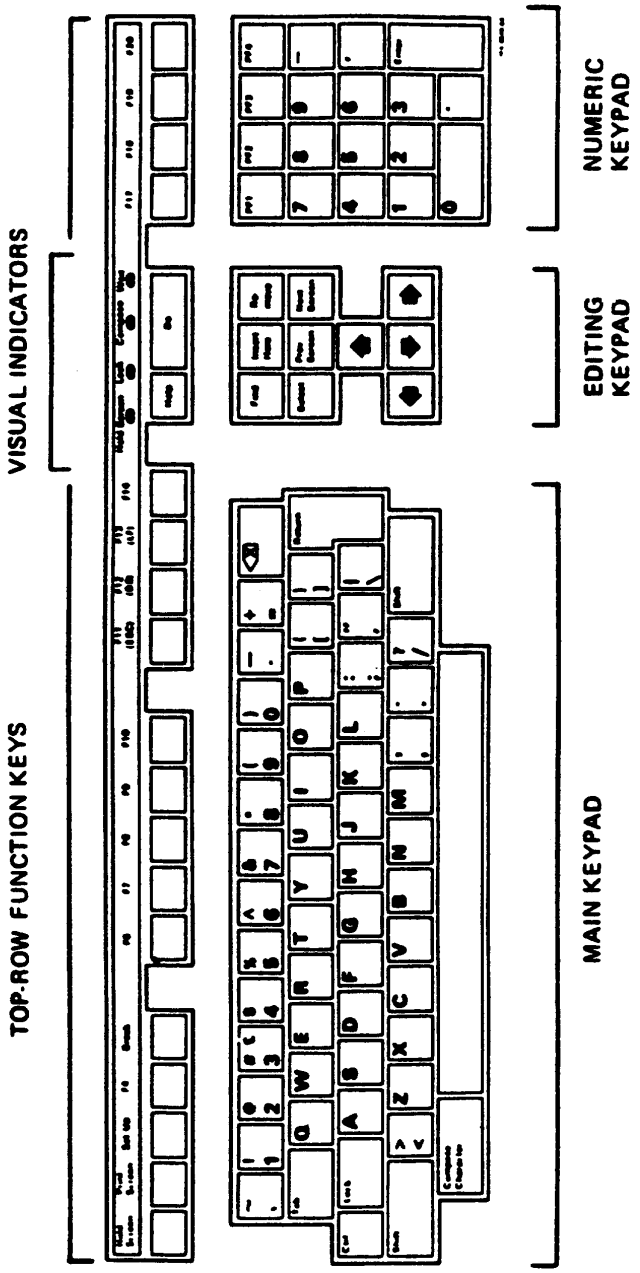


Figure 4-5. Keyboard function key groups

4.1.2 MEC System Software

The MEC system software functions on several levels: (1) the VMS operating system; (2) the database management system, ORACLE; and, (3) the USER interface.

VMS Operating System. VMS is an operating system for the VAX similar to DOS on a microcomputer. It controls the communication between the MicroVAX systems hardware. DECNET, which is part of the VMS operating system, controls the communication between the two MicroVAX computers, the MicroVAX and the VAXMate, and the MicroVAX computers and the terminal servers. The USER (dentist, health technician, or laboratory technician) interfaces with the VMS system during the Log On and Log Off procedures.

ORACLE. Oracle is a relational database management system with special applications for programming data entry procedures. As a relational database management system, ORACLE manages the MEC database by organizing the data in two dimensional tables and providing a language, SQL (Structure Query Language), and several facilities by which programmers may communicate with ORACLE to enter, modify and retrieve the data.

The USER Interface System. There are three types of user interface programs: (1) the MEC Coordinator system; (2) the Examination Component System; and (3) special component systems such as the Dental Exam, Dietary Interview, and MEC Interview. USER interface programs have been written by NCHS and NIDR consultant programmers using special applications of ORACLE and other programming languages.

Both the coordination system and the examination component system use a MENU system to allow the USERS to quickly choose one of several programs in each system. The Dental Program also uses a MENU system that contains two options.

The programs for the coordination system are used to check sample persons (SP's) into the MEC, to build a list of required exam components, to schedule SP's, MEC examination stations and MEC staff to complete required components, and to check SP's out of the MEC. In addition, the coordination system monitors Glucose Tolerance Test times, alerts the phlebotomist to deadlines, accounts for payment

of SP's and generates a session summary status for the field office following each exam session.

Programs written for the examination component system enable USERS (health and lab technicians) to enter, modify, and delete data, to print reports, logs, worksheets or shipping transmittals, and to transmit data from a component instrument to the MicroVAX and from the MicroVAX to a floppy diskette.

The data entry programs have been written so that the information presented on the screen appears as a written record on a physical form, that is, as though it were a page of a questionnaire or a log.

4.2 Sequence of a Session at the Terminal

Currently the dental exam system is structured so that the user (dentist or recorder) enters the data directly into the VAX in the MEC. The user begins an exam session by logging on the VAXmate. At the end of the session the user logs off the system.

4.2.1 Logging On To The Dental System

To log on to the system:

1. Turn the VAXmate on by pressing the power switch to on. The switch is located on the left, at the bottom of the terminal.

2. A MENU will appear on the screen. It contains eight items.

    1. "Record Dental Examination"
    2. "Start New Data File"
    3. "Use Old Data File"
    4. "Save Current Data File"
    5. "Use Most Recent File"
    6. "List Data Files with Date"

7. "Change Default Dentist I.D.#"
8. "Exit Menu System"

Choice #1 allows the dentist/recorder to enter the dental data.

Choice #2 allows a new data file to be created and an old file closed out in the computer.

Choice #3 allows replacement of current database with any previous database.

Choice #4 stress current database in its proper sequence according to date.

Choice #5 replaces current database with most recent previous database.

Choice #6 lists all databases in sequence according to date.

Choice #7 allows change of current dentist default ID number.

Choice #0 returns system to DOS (to return to data entry program, type "menu").

3. The cursor will be positioned at "choice __". Type 1 to choose the option "Record Dental Examination". It takes a minute to bring up the first screen in the dental examination data entry program. When it appears on the screen, the system is ready for dental data to be entered.

4.2.2 Logging Off the Dental System

When all exams have been entered for a particular session, press the F10 key to leave the dental data entry program and return to the MENU. Select choice #2 to start a new file for the next day.

4.2.3 Using the Dental Exam System

Attachment C is the user's guide for the Dental Exam System, prepared by David Waldrop, a consultant to NIDR. The text explains how to enter data into the system, modify data, and move back and forth from screen to screen and within screens. It also provides definitions for terms used in the system.

5. ORAL EXAMINATION METHODS AND DATA FORMS

The oral examination component in the MEC consists of a questionnaire and multiple examination subcomponents. The dentist examiner and dental recorder work as a team in executing this component for each SP. This chapter details the examination procedures and methods to be employed. It is not necessarily organized according to the usual sequence of the subcomponents.

Data will be entered by keyboard directly into computer terminals at the examination sites. Opscan data forms are provided as a backup system for recording data if the computer system fails to function properly. Display screens on the computer terminal are patterned after the opscan forms that are described in this chapter. Procedures for recording on hard copy forms are discussed in this chapter. Direct data entry was described in Chapter 4 of this manual.

5.1 Sequence of Oral Exam Procedures

Exhibit 5-1 lists the oral examination components. Included on the table are the ages of the SP for each examination component and the page number of the Dental Examination Forms on which the data are recorded. The examination methods and the recording forms will be discussed in the following sections.

Exhibit 5-2 is a guide to the examining team which lists the components in sequence, and identifies the examination components and forms for each age group of SP's. In addition, the instruments to be used for each age group are specified.

Before the SP arrives at the dental exam area, the recorder will have completed the following items on the Dental Log and Dental Questionnaire.

Name. The SP's first name (first) and last name (second).

ID Number. The SP's ID number.

Age. The SP's age on the designated line and the box for months or years checked.

Exhibit 5-1. Oral examination procedures, including ages of SP's, and forms

ORAL EXAM PROCEDURE	AGES	DENTAL DATA FORM*
Dental Questionnaire (Medical Exclusion)	A11	Dental Questionnaire
Nursing Bottle Caries	12-23 months	Dental Examination Form - page 1
ID quadrants to be examined for periodontal examination	13+	ID Number (enter selection on Daily Log)
Oral Mucosal Tissue Examination	2+	Dental Examination Form - page 3
Coronal Caries Examination	2+	Dental Examination form - page 1
Assessment of Presence of Third Molars	18+	Dental Examination Form - page 1
Root Caries Examination	18+	Dental Examination Form - page 1
Restorations and Tooth Conditions Assessment	18-74	Dental Examination Form - page 1
Traumatic Injuries	6-50	Dental Examination form - page 1
Occlusal and Dentofacial Characteristics	8-50	Dental Examination Form - page 1
Periodontal Disease Gingival Assessment Calculus Assessment Loss of Attachment Furcations	13+	Dental Examination Form - page 2
Prostheses Assessment Full Dentures (max. and mand.)	18-74 18+	Dental Examination Form - page 3
Dental Questionnaire (Denture Questions) Completely Edentulous	18-74 18+	Dental Examination Form - page 2
Smear of lesion if required	2+	Dental Examination Form - page 3

*Refer to Chapter 4, **RECORDER'S GUIDE TO DIRECT DATA ENTRY**, for corresponding computer terminal screen numbers.

Exhibit 5-2. Guide to dental examination sequence*

Age	Assessment	Date Form*
12 to 23 mo.	Nursing Bottle Caries	Page 1
2 to 5 yrs.	Oral Mucosal Tissue	Page 3
	Coronal Caries	Page 1
6 to 7 yrs.	Oral Mucosal Tissue	Page 3
	Coronal Caries	Page 1
	Traumatic Injuries	Page 1
8 to 12 yrs.	Oral Mucosal Tissue	Page 3
	Coronal Caries	Page 1
	Traumatic Injuries	Page 1
	Occlusal and Dentofacial	Page 1
13 to 17 yrs.	Identify Quadrants for Perio.	Page 2
	Oral Mucosal Tissue	Page 3
	Coronal Caries	Page 1
	Traumatic Injuries	Page 1
	Occlusal and Dentofacial	Page 1
	Periodontal @	Page 2
18 yrs. +	Oral Mucosal Tissue	Page 3
	Coronal Caries	Page 1
	Third Molar	Page 1
	Root Caries @	Page 1
	Tooth Conditions and Restorations (to age 74)	Page 1
	Traumatic Injuries (to age 50)	Page 1
	Occ. & Dentofacial (to age 50)	Page 1
	Identify Quadrants for Perio.	Page 2
	Periodontal @	Page 2
	Prostheses Condition (to age 74) **	Page 2
	Denture Questions (to age 74) ***	Page 2

INSTRUMENT PACKS

Age 12 to 23 mos.	Age 2 to 12 Years	Age 13+ Years	
None	Two mirrors #23 explorer NIDR probe	Two mirrors #23 explorer NIDR probe #17 explorer #3 explorer	Curette (packaged separately)

* The medical exclusion portion of the dental questionnaire is the first assessment for all SPs. A smear of a lesion will be taken, if required, at the end of the examination. Following the clinical examination, each SP will receive a Report of Dental Findings.

** Also performed on SP 75+ if full dentures (max. and mand.)

*** Also performed on SP 75+ if completely edentulous.

@ Not to be performed if there is a medical exclusion.

Refer to Chapter 4, **RECORDER'S GUIDE TO DIRECT DATA ENTRY**, for corresponding computer terminal screen numbers.

Example: If the SP is 5 years old, 5 is written on the line, and a check mark is placed in the box labelled "Yrs."

Sex. Mark "M" for male or "F" for female.

Examiner. The identification number assigned to the dental examiner should be recorded on the designated line. Each examiner will receive his/her ID number at training.

Recorder. The identification number assigned to the dental recorder should be recorded on the designated line. Each recorder will receive his/her ID number at training.

Date. The date the SP came to be examined should be recorded on the designated line.

5.2 Dental Questionnaire: Medical Exclusion

The examiner asks the SP about conditions which may preclude him/her from having some components of the oral exam. On the first page of the Dental Questionnaire (Exhibit 5-3), the examiner reads the questions and marks the appropriate "yes" or "no" boxes. Once you receive a "yes" to a question that leads to a medical exclusion (e.g., the first yes, except Q.2 "A heart problem"), you do not continue to ask the rest of the questions.

If only "no" boxes were checked on the first page of the form, there are no medical exclusions for the SP, and all assessments for SPs in that age category should be performed. However, if any "yes" box(es), which are marked medical exclusion, were checked, this indicates there is a medical exclusion for the SP. In these cases, all the assessments should be performed except root caries and the four periodontal assessments.

5.3 Dental Questionnaire: Denture Questions

The dentist asks these questions (Exhibit 5-4) of SP's 18-74 years old who are edentulous in one or both arches, and the recorder records the SP's answers. These questions are asked after the periodontal assessment.

Exhibit 5-3. Dental questionnaire - Part A

Approval Expires

DENTIST'S EXAM

(Ages 1 and Older)

STAFF NO. ____ ____ ____ ____

SAMPLE NO. ____ ____ ____ ____ ____ ____ ____

1. Has a doctor or dentist ever told you that you must take antibiotics (e.g., penicillin) before you get a dental check-up or care? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

Before we begin, I'd like to read you a list of health conditions that some people have. As I read off each condition, please tell me whether or not a doctor has ever told you that you have the condition. Has a doctor ever told you that you have:

2. A heart problem? 1 ☐ Yes 2 ☐ No (Q7)

Was the heart problem due to . . .

3. Congenital heart murmurs? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

4. A heart valve problem? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

5. Congenital heart disease? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

6. Bacterial endocarditis? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

Has a doctor ever told you that you have:

7. Rheumatic fever? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

8. Kidney disease requiring renal dialysis? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

9. Hemophilia? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

Do you have:

10. A pacemaker or other artificial material in your heart, veins or arteries? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

11. A hip, bone, or joint replacement? 1 ☐ Yes (MEDICAL EXCLUSION) 2 ☐ No

Exhibit 5-4. Dental questionnaire - Part B

	CHECK ITEM (DENTIST OBSERVATION)	EDENTULOUS IN UPPER JAW 1 ☐ No (END) 2 ☐ Yes, denture present 3 ☐ Yes, no denture visible	EDENTULOUS IN LOWER JAW 1 ☐ No (END) 2 ☐ Yes, denture present 3 ☐ Yes, no denture visible
1.	Do you have (a) denture(s) or (a) plates(s) for your (upper/lower)jaw?	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No
2.	Do you usually wear your (upper/lower) denture(s) (plate)	1 ☐ All the time 2 ☐ Only when awake 3 ☐ Only occasionally 4 ☐ Don't wear them	1 ☐ All the time 2 ☐ Only when awake 3 ☐ Only occasionally 4 ☐ Don't wear
3.	During the past year, have you had problems with your denture(s) (plate)?	1 ☐ Yes 1 ☐ No	1 ☐ Yes 1 ☐ No
4.	Do you think that you need (a) new dentures(s) (plate) or that the one you have needs refitting?	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No
5.	How long has it been since you had any natural teeth to chew with in your (upper/lower jaw)	1 ☐ Less than one year 2 ☐ 1-4 years 3 ☐ 5-9 years 4 ☐ 10-19 years 5 ☐ 20 or more years	1 ☐ Less than one year 2 ☐ 1-4 years 3 ☐ 5-9 years 4 ☐ 10-19 years 5 ☐ 20 or more years

5.4 Selecting Random Quadrants for Periodontal Assessment

The computer program selects and indicates random quadrants for periodontal assessment. However, if the computer program fails to function properly, the fifth and sixth digits of the SP's ID number will be used to select random quadrants as follows:

The fifth digit of the ID number will be used to select the upper quadrant. If this number is even, the right side will be used. If this number is odd, the left side will be used.

Similarly, the sixth digit of the SP's ID number will be used to select the lower quadrant for the periodontal examination. If this number is even, the right side will be used. If this number is odd, the left side will be used.

The quadrant selected will then be indicated in the upper right-hand side of page 2 of the dental examination form, above the Periodontal Exam area.

For example, if the SP's ID number is 123456, this would represent a left upper and right lower designation for the SP.

1	2	3	4	5	6 - 7
			left upper	lower	right

5.5 Oral Mucosal Tissue Assessment

5.5.1 Introduction

The objectives of the oral soft tissue component of the survey are to:

- Determine the prevalence of selected pathological conditions affecting the oral soft tissues in a national sample;
- Provide a basis for comparison with future surveys;
- Provide baseline data for possible followup of selected subsamples;
- Provide a basis for the future development of estimates of treatment needs; and
- Study the association between oral mucosal pathologies and selected risk factors.

Findings from the NHANES III can also be compared with national data of the prevalence of oral mucosal pathologies found in children, which were collected in the 1986-87 NIDR National Survey of Oral Health in School Children. In addition, findings of smokeless tobacco-associated lesions can be compared with data from some U.S. state and local studies.

Because the range of oral mucosal pathologies is broad and varies widely with age of the population and other variables, it is not possible to assess the prevalence of these conditions by use of a single epidemiologic index. Rather, the examiners must be trained to recognize the clinical characteristics of each condition of interest, as well as other conditions that may present problems in differential diagnosis. Lesions or conditions of specific interest in this survey have been carefully selected on the basis of their anticipated frequency of occurrence, their clinical significance, and their ability to be diagnosed by clinical methods alone.

For children and adolescents, special consideration has been given to the detection of mucosal pathology resulting from the use of smokeless tobacco. While these lesions are the central focus in this age group, the examiners also must be able to recognize a number of other mucosal lesions likely to occur in children. This helps not only with differential diagnosis of the tobacco-associated lesions, but also

permits the recording of information on the prevalence of these other conditions, which may themselves be of some interest. For adults, the focus will be on cancer, pre-cancer, and conditions that predispose to cancer, as well as pathologies related to denture wearing and tobacco use. As an adjunct to the clinical examination, a questionnaire will be used in the household to collect information about risk factors, such as the use of smokeless tobacco, smoking tobacco, and alcohol.

Training for this module consists of a procedure for conducting the soft tissue examination, an explanation of the diagnostic criteria for the selected lesions of interest, and instruction in the use of the data collection form. Because representative oral lesions are somewhat rare, it will not be possible to arrange for patients with typical pathologies to be examined as part of the training session. Training for the diagnostic criteria will thus consist of a presentation of the written criteria along with color photographs to illustrate the characteristic features of each lesion or condition.

The data collection form has been designed so that lesions for which a diagnosis can easily be made can simply be checked off or written in. The form is also designed to permit the examiner to enter a clinical description of the pathology. A mechanism is provided to permit the referral of patients for treatment when necessary; guidelines for referral are also provided.

Training Material

The training material consists of the following:

1. A description of the examination procedure;
2. The data collection form and instructions for its use;
3. A guide to referral, followup, and smears;
4. Procedures for the smearing of suspected candidal lesions; and
5. A series of slides with narratives highlighting diagnostic criteria for selected oral lesions.

Referral

For most of the conditions of interest in the survey, subjects should be referred for further evaluation by a dentist or dental specialist. Lesions that need not be referred are noted in the Guide to Referral, Follow-up, and Smears, which accompanies this section of the manual. Lesions considered to have malignant potential are identified as requiring follow-up referral. For the remaining lesions the SP should see a dentist at his/her earliest convenience.

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5.5.2 Oral Mucosal Tissue Examination Procedure

Equipment and Supplies

2 mouth mirrors
2 2x2 gauze squares

Procedures:[**]

The examination procedure follows a systematic assessment of the lips; labial mucosa and sulcus; commissures, buccal mucosa and sulcus; gingiva and alveolar ridges, tongue; floor of the mouth; and hard and soft palate.

1. Begin examination by observing the lips with the mouth both closed and open. Note the color, texture and any surface abnormalities of the upper and lower vermilion borders.

2. With the mouth partially open, visually examine the labial mucosa and sulcus of:

   a. the maxillary vestibule and frenulum, and
   b. the mandibular vestibule.

   Observe the color and any swelling or other abnormalities of the vestibular mucosa and gingiva.

3. Using the two mouth mirrors as retractors and with the mouth open wide, examine first the right, then the left buccal mucosa extending from the labial commissures and back to the anterior tonsillar pillar. Note any change in pigmentation, color, texture, mobility and other abnormalities of the mucosa, make sure that the commissures are examined carefully and are not covered by the mouth mirrors during retraction of the cheek.

4. Next, examine the gingiva and alveolar ridges (processes).

   a. Buccal and Labial Aspects

   Start with the right maxillary posterior gingiva and alveolar ridge and move around the arch to the left posterior gingiva. Continue with the left mandibular posterior gingiva and alveolar ridge and move around the arch to the right posterior gingiva.

[**]Abstracted from the World Health Organization's Guide to Epidemiology and Diagnosis of Oral Mucosal Diseases and Conditions (reprinted from Community Dentistry and Oral Epidemiology, 1980;8:1-26).

b. Palatal and Lingual Aspects

Same as above except on the palatal for the maxillary (right to left) examination and on the lingual for the mandibular (left to right) examination.

5. With the tongue at rest, and mouth partially open, inspect the dorsum of the tongue for any swelling, ulceration, coating or variation in size, color or texture. Also note any change in the pattern of the papillae covering the surface of the tongue and examine the top and the tip of the tongue. The subject should then protrude the tongue, and the examiner should note any abnormality of mobility. With the aid of mouth mirrors, inspect the margins of the tongue. Grasping the tip of the tongue with a piece of gauze will assist full protrusion and will aid examination of the margins. Then observe the ventral surface.

6. With the tongue still elevated, inspect the floor of the mouth for swellings or other abnormalities.

7. With the mouth wide open and the subject's head tilted backwards, gently depress the base of the tongue with a mouth mirror. First inspect the hard, and then the soft palate.

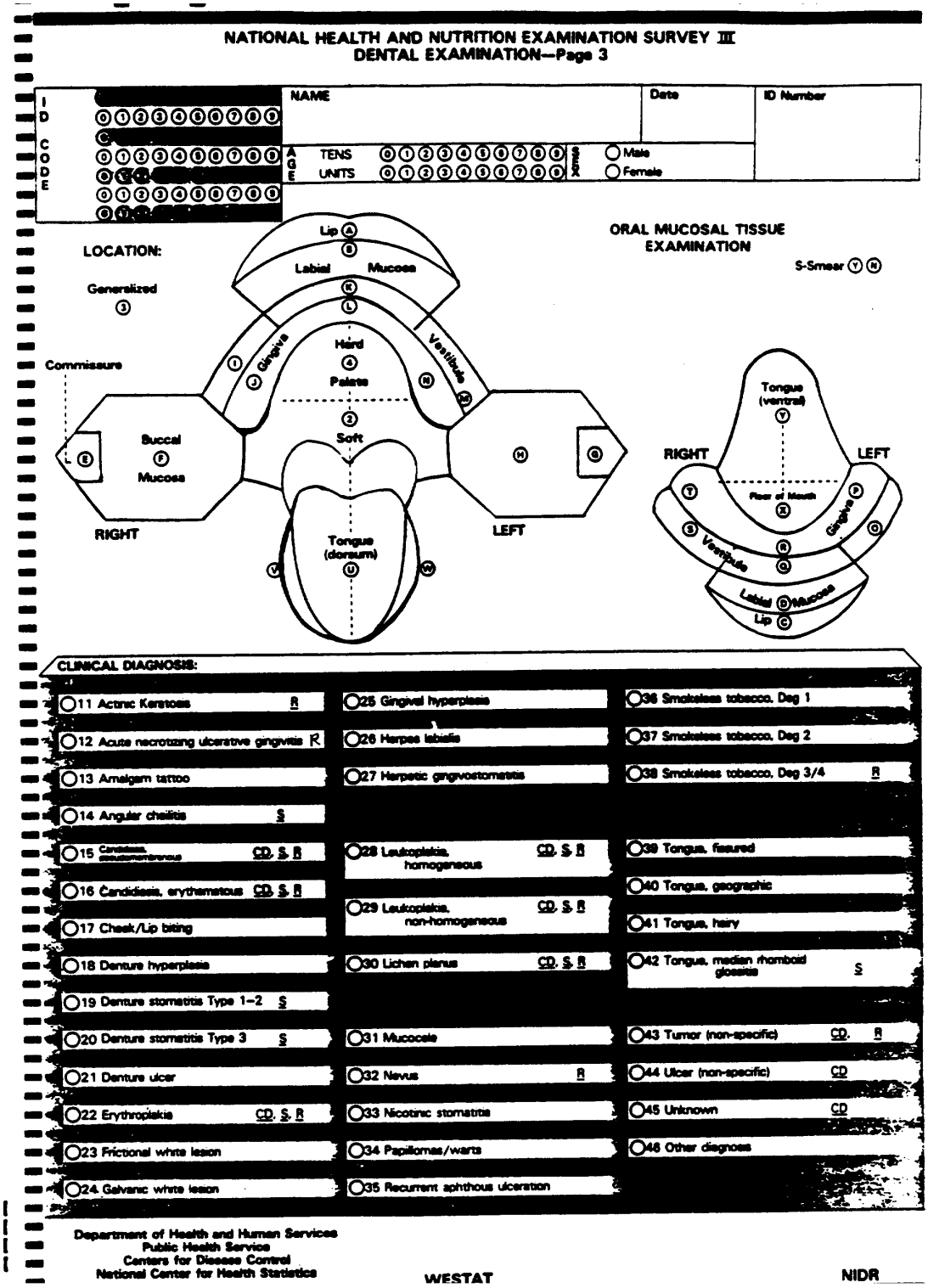
   Mucosal or facial tissues that seem to be abnormal should be palpated.

5.5.3 Guide to NHANES III Oral Soft Tissue Lesions Recording Form (Dental Examination Form - page 3)

Each form can be used for only one lesion or condition per subject. If more than one condition is found, additional forms should be used. For suspected smokeless tobacco lesions, each individual lesion in an SP should be treated as a separate lesion and recorded on separate forms.

The form has three major components: an oral cavity diagram for specifying location; a section for the identification of a clinical diagnosis; and a section to clinically describe the lesion(s). In addition, there is a space to indicate whether the lesion has been smeared. (See Exhibit 5-5 for a copy of the form.)

Exhibit 5-5. Dental examination form



NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION—Page 3

ID CODE

NAME | Date | ID Number

AGE TENS / UNITS | SEX: Male / Female

LOCATION:
Generalized
Commissure
Lip
Labial Mucosa
Gingiva
Hard Palate
Soft Palate
Vestibule
Buccal Mucosa
RIGHT
LEFT
Tongue (dorsum)

ORAL MUCOSAL TISSUE EXAMINATION
S-Smear

Tongue (ventral)
Floor of Mouth
Gingiva
Vestibule
Labial Mucosa
Lip

CLINICAL DIAGNOSIS:

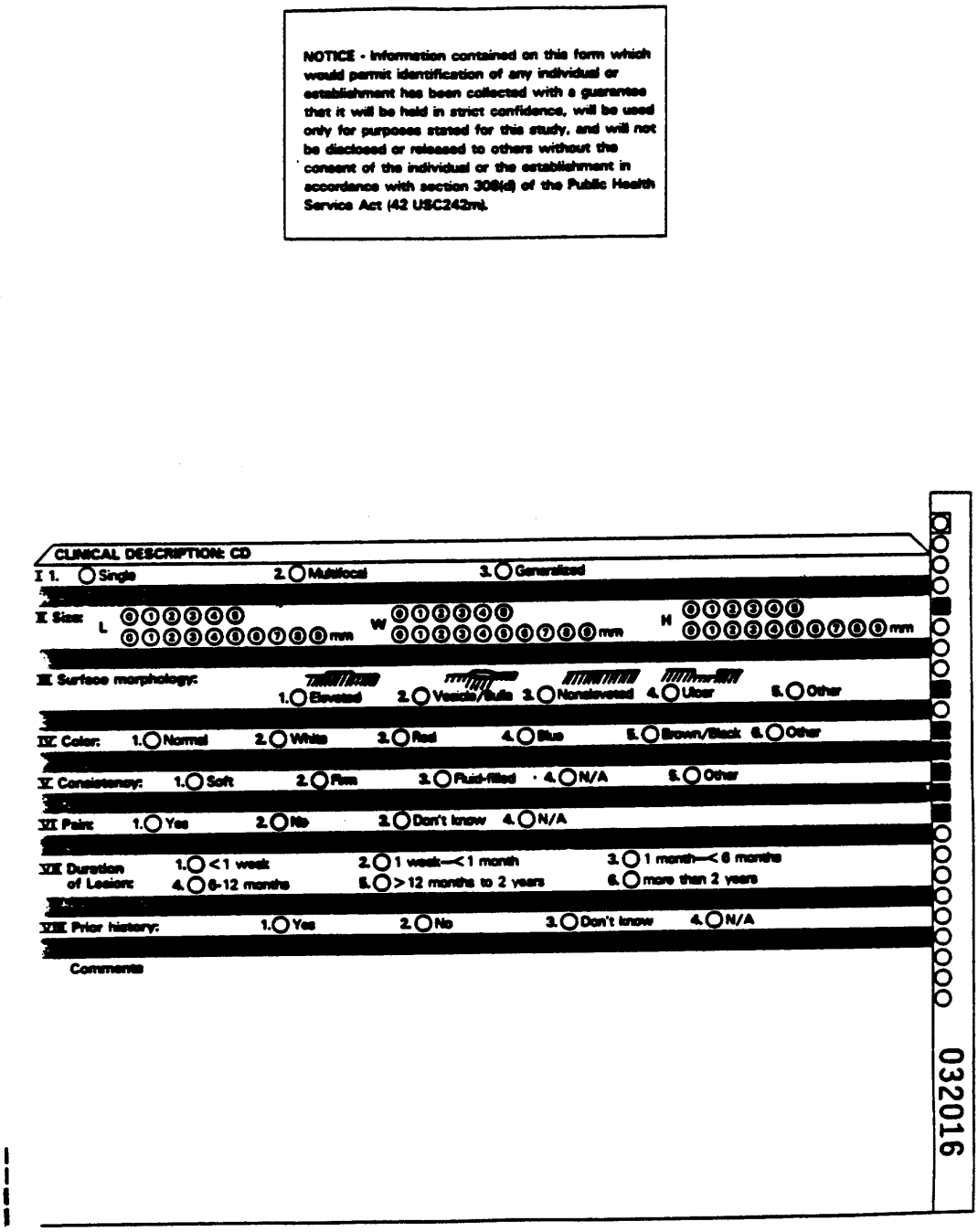
11 Actinic Keratosis R	25 Gingival hyperplasia	36 Smokeless tobacco, Deg 1
12 Acute necrotizing ulcerative gingivitis R	26 Herpes labialis	37 Smokeless tobacco, Deg 2
13 Amalgam tattoo	27 Herpetic gingivostomatitis	38 Smokeless tobacco, Deg 3/4 R
14 Angular cheilitis S		
15 Candidiasis, pseudomembranous CD, S, R	28 Leukoplakia, homogeneous CD, S, R	39 Tongue, fissured
16 Candidiasis, erythematous CD, S, R	29 Leukoplakia, non-homogeneous CD, S, R	40 Tongue, geographic
17 Cheek/Lip biting		41 Tongue, hairy
18 Denture hyperplasia	30 Lichen planus CD, S, R	42 Tongue, median rhomboid glossitis S
19 Denture stomatitis Type 1–2 S		
20 Denture stomatitis Type 3 S	31 Mucocele	43 Tumor (non-specific) CD, R
21 Denture ulcer	32 Nevus R	44 Ulcer (non-specific) CD
22 Erythroplakia CD, S, R	33 Nicotinic stomatitis	45 Unknown CD
23 Frictional white lesion	34 Papillomas/warts	46 Other diagnosis
24 Galvanic white lesion	35 Recurrent aphthous ulceration	

Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics

WESTAT

NIDR

Exhibit 5-5. Dental examination form (continued)



NOTICE - Information contained on this form which would permit identification of any individual or establishment has been collected with a guarantee that it will be held in strict confidence, will be used only for purposes stated for this study, and will not be disclosed or released to others without the consent of the individual or the establishment in accordance with section 308(d) of the Public Health Service Act (42 USC242m).

CLINICAL DESCRIPTION: CD

I 1. ○ Single 2. ○ Multifocal 3. ○ Generalized

II Size: L ⓪①②③④⑤⑥⑦⑧⑨ ⓪①②③④⑤⑥⑦⑧⑨ mm W ⓪①②③④⑤⑥⑦⑧⑨ ⓪①②③④⑤⑥⑦⑧⑨ mm H ⓪①②③④⑤⑥⑦⑧⑨ ⓪①②③④⑤⑥⑦⑧⑨ mm

III Surface morphology: 1. ○ Elevated 2. ○ Vesicle/Bulla 3. ○ Nonelevated 4. ○ Ulcer 5. ○ Other

IV Color: 1. ○ Normal 2. ○ White 3. ○ Red 4. ○ Blue 5. ○ Brown/Black 6. ○ Other

V Consistency: 1. ○ Soft 2. ○ Firm 3. ○ Fluid-filled 4. ○ N/A 5. ○ Other

VI Pain: 1. ○ Yes 2. ○ No 3. ○ Don't know 4. ○ N/A

VII Duration of Lesion: 1. ○ < 1 week 2. ○ 1 week—< 1 month 3. ○ 1 month—< 6 months 4. ○ 6-12 months 5. ○ > 12 months to 2 years 6. ○ more than 2 years

VIII Prior history: 1. ○ Yes 2. ○ No 3. ○ Don't know 4. ○ N/A

Comments

032016

A. Location

On the diagram provided, identify the topographic location and mark the nearest circle(s) in the appropriate areas. If the condition is generalized, mark the circle labelled "generalized."

B. Clinical Diagnosis

All conditions will be recorded either as a definitive diagnosis, or as unknown.

1. When a clinical diagnosis can be made, then

   Check the appropriate lesion or write in the name of the lesion in the space following "other" if it is not one of the listed lesions but you are sure of the diagnosis.

2. If a clinical diagnosis cannot be made, then check "unknown."

C. Clinical Description

For the following lesions the clinical description portion of the form will be completed: candidiasis, erythroplakia, hairy leukoplakia, leukoplakia, lichen planus, tumors, ulcers and unknowns.

1. Presentation: Mark whether the lesion is single, multifocal, or generalized.

2. Size:

   a. Single lesions

      Record length and width in millimeters for flat lesions. For elevated lesions also record the height.

   b. Multifocal lesions

      Record size of largest single lesion as described above.

   c. Generalized conditions

      Size need not be specified.

3. Surface Morphology

   Check the most appropriate surface morphology. If the lesion has multiple components, record the appearance of the predominant component. If the morphology is different from those listed on the form, describe the morphology under "other."

4. Colors

Specify the predominant color. If the lesion is a color other than those on the form, specify the predominant color under "other." If no single color predominates, check as many colors as apply.

5. Consistency

For lesions that can be palpated, check the appropriate consistency: soft, firm, fluid-filled or other. If the consistency is different from those listed, specify under "other."

6. Pain

Ask the subject whether the lesion in question is painful at the present time, and record the response.

7. Duration

Ask about the duration of the lesion in question and mark the form accordingly. If the duration is not known, leave this item blank.

8. Prior History

Inquire if the subject has had a similar lesion in the past and specify "yes," "no," or "unknown" in the space provided.

9. Comment

When using the Opscan form, write only in the bottom 1/2 inch of the form since any markings above this point may obscure markings on the first page.

If a smear is indicated, on the first page of the form, specify whether or not it was taken, by marking a "Y" for yes and "N" for no.

5.5.4 NHANES III - Oral Mucosal Lesions and Conditions: Guide to Referral, Followup, and Smears

	Lesions to be Referred*	Lesions Requiring Follow-up Referral**	Lesions to be Smeared
Actinic keratosis	X	X	
Acute necrotizing ulcerative gingivitis	X	X	
Amalgam tattoo			
Angular cheilitis	X		X
Candidiasis			
- Acute pseudomembranous	X	X	X
- Acute erythematous	X	X	X
Cheek/lip biting			
Denture-related lesions			
- Denture hyperplasia	X		
- Denture stomatitis			
- Type 1-2	X		X
- Type 3	X		X
- Denture ulcer	X		
Erythroplakia	X	X	X
Frictional white lesion	X		
Galvanic white lesion	X		
Gingival hyperplasia	X		
Herpes labialis			

*see dentist at earliest convenience
**see dentist within 2 weeks

NHANES III - Oral Mucosal Lesions and Conditions:
Guide to Referral, Followup, and Smears (continued)

	Lesions to be Referred	Lesions Requiring Follow-up Referral	Lesions to be Smeared
Herpetic gingivostomatitis	X		
Leukoplakia	X	X	X
Lichen Planus	X	X	X
Mucocele	X		
Nevus	X	X	
Nicotinic stomatitis			
Papillomas/warts	X		
Recurrent aphthous ulceration			
Smokeless tobacco lesion			
- Degree 1	X		
- Degree 2	X		
- Degree 3/4	X	X	
Tongue lesions			
- Fissured tongue			
- Geographic tongue			
- Glossitis (non-specific)			
- Hairy tongue			
- Median rhomboid glossitis	X		X
Tumor (non-specific)	X	X	
Ulcer (non-specific)	X		
Unknown	X		

5.5.5 Procedures for the Smearing of Suspected Candidal Lesions

1. Materials:

a. Sterile tongue depressors (individually wrapped)*

b. Slides*

c. Log Book

d. Slide Containers: for storage and transport of slides

e. Sterile saline

f. Labels

2. Procedure:

a. For each separate lesion, as needed, prepare one slide.

b. Write SP # on slide, and include date and transmittal sheet slide number.

c. Record information on the transmittal sheet including: date, SP number, site number from the oral mucosal form, and appearance of lesion (name and code number from the clinical appearance section of the oral mucosal form). See Exhibit 5-6 for a copy of the transmittal sheet.

d. Using a sterile tongue blade, scrape the surface of the lesion 2-3 times.

e. Holding the blade flat against the slide, spread the material onto the slide, covering most of the surface area of the slide. (If spreading is very difficult due to dryness of the area swabbed, one drop of sterile saline may be placed on the slide.)

f. Allow the slide to "just dry"; lay flat to dry.

g. Transfer slide to slide container for storage and eventual shipment to laboratory; slides may be kept at room temperature.

* **An oral lesion smear set consists of a tongue blade and slide that has been placed in a chemiclave bag and sterilized.**

3. Shipping:

Mail slides at the end of the week to the contractor who will be doing analyses of slides, using transmittal procedures in place for non-questionnaire, non-laboratory items (e.g., ECG, tracings, X-rays). A Candidiasis Smears Transmittal Sheet appears as Exhibit 5-6. This form will have to be completed to document the fact that you have shipped slides. Procedures for shipping slides are discussed in Chapter 6, Exam Related Forms and Procedures.

Exhibit 5-6. Candidiasis smears transmittal sheet

NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III

Stand Number _____ Examiner #: _____

Location _____ Date: ____/____/____

Slide #	SP ID #	Recorder #	Date Taken	Clinical Impression	Location #'s
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		

5.5.6 NHANES III Oral Mucosal Lesions and Conditions

The diagnostic criteria for oral mucosal lesions and conditions to be followed for the NHANES dental exam are described in Table 5-1. The order of the slides and diagnostic criteria by color, topography and/or morphology are provided below.

Order of Slides and Diagnostic Criteria by Color, Topography, and/or Morphology

1.	White Non-adherent lesions	Candidiasis, acute pseudomembranous Aspirin burn
2.	White or White/Red Adherent Lesions	Local etiology present/suspected: Smokeless tobacco lesions Nicotinic stomatitis Frictional white lesion Galvanic white lesion Cheek/lip biting Local etiology not present: Leukoplakia Lichen planus Candidiasis, chronic hyperplastic
3.	Red Lesions	Candidiasis, acute atrophic Erythroplakia
4.	Denture-related Lesions	Denture stomatitis Denture hyperplasia Denture ulcer
5.	Perioral Conditions	Actinic keratosis Angular cheilitis
6.	Tongue Lesions	Fissured tongue Geographic tongue Hairy tongue Median Rhomboid Glossitis
7.	Ulcers	ANUG Herpetic gingivostomatitis Herpes labialis Recurrent aphthous ulceration Ulcer (non-specific)

8.	Elevated Lesions	Gingival hyperplasia Mucocele Focal epithelial hyperplasia Papilloma Verruca vulgaris Tumor (non-specific)
9.	Pigmented Lesions	Amalgam tatoo Nevus Racial pigmentation
10.	Lesions associated with HIV infection	Candidiasis Hairy leukoplakia Kaposi's sarcoma HIV-gingivitis HIV-periodontitis

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions

Lesions	Criteria	Comments
1. White Non-adherent lesions		
a. Candidiasis, acute pseudomembranous	- Creamy white patches - Wipable, leaving red or bleeding surface	
b. Aspirin burn	- White necrotic epithelium - Will slough off/rub off to reveal ulcer underneath	- Ask patient whether s/he has placed an aspirin in that area of his/her mouth. - If the lesion is 'aspirin burn', then check 'other' on the clinical diagnosis and write in 'aspirin burn.'
2. White or White/Red Adherent Lesions		
a. Local etiology present/suspected:		
1. Smokeless tobacco lesions		
	Degree 1:	
	Slight, superficial wrinkling of the mucosa. Color of the mucosa may range from normal to pale white or gray. Mucosa does not appear to be thickened.	- For suspected smokeless tobacco lesions, do not probe the SP about smokeless tobacco use.
	- Wrinkles are fine, superficial, and close together.	
	- Color changes, if any, are usually subtle.	
	- Lesions tend to disappear when mucosa is stretched.	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

	Lesions	Criteria	Comments
		Degree 2: Distinct whitish, grayish or occasionally reddish color change. Wrinkling is obvious, but there is no thickening of the mucosa. - Wrinkles are more distinct and linear than in Degree 1 lesions. - Wrinkling may disappear when mucosa is stretched, but color change remains. Degree 3: Mucosa is obviously thickened, with distinct whitish or grayish color change. Deep furrows are present within the thickened areas. - Often appears as broad bands of whitish, thickened mucosa separated by furrows of normal or reddish color. - Thickened mucosa and furrows remain visible, even when tissue is stretched.	
2.	Nicotinic stomatitis	- Early stage shows a reddening of palate to a diffuse grayish-white wrinkled palate - Late stage presents with a thickened palatal mucosa and multiple nodules with a small red dot in their center, at the opening of the salivary duct outlets - Most often seen in pipe smokers	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions		Criteria	Comments
3.	Frictional white lesion	- Whitish or grayish patch on the mucosa which cannot be rubbed off - Site of the lesion corresponds to a recognizable source of mechanical trauma	
4.	Galvanic white lesion	- White lesion which cannot be rubbed off - Always found in proximity to amalgam or metal restoration	
5.	Cheek/lip biting	- Oral mucosa shows a rough, gray-white, macerated surface with irregular, flaky desquamation - Lesion is located where self-infliction by chewing is possible	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
b. Local etiology not present:		
1. Leukoplakia	- A white patch, or plaque, that cannot be wiped off and cannot be characterized clinically or pathologically as any other disease - Varies from small circumscribed areas to extensive lesions involving a large area of the mucosa - Surface appearance is variable; - May be smooth or wrinkled - Smooth-surfaced but traversed by small cracks or fissures - Nodular or speckled (white areas intermingled with red zones) - Color can be white, whitish-yellow or gray - Recommended subdivisions: - Homogeneous: lesions that are uniformly white with smooth or corrugated surface - Non-homogeneous: lesions in which part is white and part appears reddened. Three types have been described: 1. Erythroleukoplakia (erosive leukoplakia) - white lesion that includes red areas	- White lesions which do not have a local etiology could be diagnosed clinically as either leukoplakia or lichen planus, depending upon their appearance. - The clinical diagnosis portion of the recording form allows the documentation of 'homogeneous' or 'non-homogeneous' leukoplakia.

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
	2. Nodular leukoplakia - lesion with slightly raised white areas (granules or nodules) interspersed with reddened areas 3. Verrucous leukoplakia - exophytic lesion with irregular sharp or blunt projections	
2. Lichen planus	Oral lesions of lichen planus show a great variation of clinical appearance. All types may show the presence of Wickham's striae, which appear as delicate white keratinized lines. The white structures cannot be wiped off. Clinical presentations include the following: 1. Reticular form, with interlacing striae forming a lattice or annular pattern (most common type). 2. White, pinhead-size papules. 3. White, plaque-like lesions with striae at the margins. 4. Erythematous areas with striae at the margins. 5. Atrophy of tongue papillae, with a dry, whitish surface. 6. Areas of erosion or ulceration with striae at the margins. 7. Vesicles or bullae with clear or slightly red fluid in conjunction with any of the above.	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
3. Candidiasis, chronic hyperplastic	- Adherent white plaque - May be flat or elevated - May incorporate erythematous areas	- This condition is difficult to differentiate from leukoplakia. If seen, then the examiner will record as 'homogeneous leukoplakia.'
3. Red Lesions a. Candidiasis, acute atropic	- Bright red atrophic patches on mucosa - Burning or itching sensation is common - Palate is a common location	
b. Erythroplakia	- Bright red patches or plaques of mucosa that cannot be characterized clinically or pathologically as any other condition.	
4. Denture-related Lesions a. Denture stomatitis	- Inflammatory changes seen beneath a denture - Three types have been classified: Type I -- localized simple inflammation, with red spots usually around the small palatal salivary glands and diffuse inflammation of a limited areas of the palatal mucosa Type II - diffuse hyperemic mucosa extending over the entire denture-bearing area, with a smooth surface Type III - hyperemic mucosa with a papillary or nodular surface appearance, usually localized to central part of the hard palate	- For clinical diagnosis Type I/II stomatitis will be differentiated from Type III. - These conditions are noted on the palatal mucosa and could be seen under the framework of partial dentures as well as under full dentures.

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
b. Denture hyperplasia	- Overgrowth of tissues under and around ill-fitting dentures - Color is normal to reddened - Tissue is firm to palpation - Often located adjacent to the denture flange area ("epulis fissuratum") or in the palate beneath an upper denture	
c. Denture ulcer	- Ulcer(s) under or adjacent to a denture - Small, painful, irregularly-shaped lesion - Grayish-yellowish lesion sometimes surrounded by red halo	
5. Perioral Conditions		
a. Actinic keratosis (actinic elastosis or actinic cheilitis)	- Vermilion border poorly defined (loss of distinction between vermilion border, labial mucosa and adjacent skin) - The border may have localized crust formation and/or a whitish color - Most common in patients with outdoor occupations	
b. Angular cheilitis	- Bilateral folds in the skin of the labial commissures - Surface tissue appears wrinkled, fissured or cracked - No tendency to bleeding, although a crusted exudate may be present - Mucosal surfaces of commissures are usually not involved	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
6. Tongue Lesions		
a. Fissured tongue (plicated tongue)	- Shallow or deep fissures on the dorsum of the tongue - Most common pattern is a marked central fissure, from which smaller fissures radiate laterally like ribs in a leaf - Food debris may accumulate in fissures and result in inflammation - Often associated with geographic tongue	
b. Geographic tongue	- Localized absence of filiform papillae - Affected areas are irregularly shaped - Areas change location over time	
c. Hairy tongue	- Overgrowth of filiform papillae in which they become elongated or thickened - Color of tongue varies from white to yellow or greenish, but is most commonly brown or black	
d. Median rhomboid glossitis	- Deep red or white ovoid area devoid of tongue papillae - Located in the central dorsum of the tongue near the foramen caecum - Sometimes demarcated from surrounding mucosa by a furrow	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
e. Hairy leukoplakia	- Flat white lesion which cannot be rubbed off - Corrugated surface appearance - Usually found on the lateral border of the tongue (often bilateral)	
7. Ulcers a. ANUG (acute necrotizing ulcerative gingivitis)	- "Punched-out" papillae - Pseudomembranous exudate - Bleeding upon slight palpation - Pain - Distinctive oral odor	
b. Herpetic gingivostomatitis (primary herpes)	- Severe gingival inflammation - Whitish, serofibrinous exudate - Vesicles and/or shallow ulcers - Pain, malaise, fever	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
c. Herpes labialis (secondary herpes)	- Clusters of vesicles or crusts - Usually found on vermilion border - Duration: less than three weeks - History of recurrence	- The SP must be probed for past history and duration in order to justify the clinical diagnosis.
d. Recurrent aphthous ulceration	- Well-defined, grayish-white ulcer(s) - Ulcers surrounded by red halo - Usually found on unkeratinized mucosal surfaces - Pain - Duration: 10-21 days - History of recurrence	- The SP must be probed for past history and duration in order to justify the clinical diagnosis.
e. Ulcer (non-specific)	- Traumatic ulcers - Idiopathic ulcers - Toothbrushing - induced ulcers	- The clinical picture of such ulcers will vary depending upon the time since insult.
8. Elevated Lesions		
a. Gingival hyperplasia	- Enlarged gingiva and interdental papillae - Papillae may be stippled or glazed in appearance - Usually presents as a generalized condition	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
b. Mucocele	- Well-defined, fluid-filled swelling - Normal, pink or bluish color - Commonly found on labial mucosa and floor of the mouth (ranula)	
c. Focal epithelial hyperplasia (Heck's Disease)	- Multiple circumscribed soft elevations - Whitish to normal coloration - Primarily seen in American Indians and Eskimos	
d. Papilloma	- Exophytic growth, usually pedunculated - Verrucous, "cauliflower-like" surface - White or grayish color is characteristic	- As these two conditions are similar in appearance, they will be diagnosed as "papilloma/verrucous vulgaris."
e. Verruca vulgaris	- Sessile or pedunculated lesions(s) - Papillomatous surface - Common locations are the labial commissure and gingiva	
f. Tumor (non-specific)	- The slides review selected tumors	- Any elevated lesions which do not fit any other diagnoses should be identified as 'Tumors.'

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
9. Pigmented Lesions		
a. Amalgam tattoo	- Asymptomatic pigmented area, non-elevated - Bluish, blackish or slate-gray color - Borders are usually poorly defined - Mucosal surface appears normal	
b. Nevus	- Well-circumscribed flat or elevated area - Pigmented with melanin - Color range from blue to brown or black - Cannot be classified as due to exogenous pigmentation	
c. Racial pigmentation	- (Only for discussion)	
10. Lesions associated with HIV infection		
a. Candidiasis		- The various types of candidiasis have been mentioned previously
b. Hairy leukoplakia		- Criteria for hairy leukoplakia have been presented.
c. HIV gingivitis	- Distinct erythematous band at the ginvival margin. - May extend onto keratinized mucosa as diffuse erythema or petechia-like lesions	

Table 5-1. Diagnostic criteria for oral mucosal lesions and conditions (continued)

Lesions	Criteria	Comments
d. HIV periodontitis	- Interproximal ulceration and necrosis - Rapid progression - Marked edema and erythema - Intense deep bony pain - Spontaneous bleeding, especially nocturnally	
e. Kaposi's sarcoma	- Initially seen as a bluish or reddish macule - Later may become elevated and/or lobular - Palate and gingivae are common oral locations	

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT

1. Title slide - NHANES III
2. General categories of lesions - review
3. Lesions covered under "White non-adherent lesions"
4. Diagnostic criteria for **acute pseudomembranous candidiasis**
5. Acute pseudomembranous candidiasis - buccal lesion
6. Acute pseudomembranous candidiasis - generalized condition
7. Diagnostic criteria for **aspirin burn**
8. Aspirin burn - early lesion on labial mucosa
9. Subdivision for white or white/red adherent lesions.
10. Lesions to be covered under subdivision "local etiology present/suspected"
11. **Smokeless tobacco**: classification system
12. **Smokeless tobacco**: classification system - Degree 1
13. **Smokeless tobacco**: classification system - Degree 1 lesion - buccal mucosa and vestibule
14. **Smokeless tobacco**: classification system - Degree 1 lesion - labial mucosa and vestibule
15. **Smokeless tobacco**: classification system - Degree 2
16. **Smokeless tobacco**: classification system - Degree 2 lesion - buccal mucosa and vestibule
17. **Smokeless tobacco**: classification system - Degree 2 lesion - labial mucosa and vestibule
18. **Smokeless tobacco**: classification system - Degree 3
19. **Smokeless tobacco**: classification system - Degree 3 lesion - buccal mucosa and vestibule
20. **Smokeless tobacco**: classification system - Degree 3 lesion - buccal mucosa and vestibule
21. **Smokeless tobacco**: classification system - Degree 3 lesion - labial mucosa and vestibule

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT (continued)

22. **Smokeless tobacco**: classification system - Degree 3 lesion - labial mucosa and vestibule
23. Diagnostic criteria for **nicotinic stomatitis**
24. Nicotinic stomatitis - hard and soft plate
25. Nicotinic stomatitis - soft plate
26. Diagnostic criteria for **frictional white lesion**
27. Frictional white lesion - palatal lesion
28. Diagnostic criteria for **galvanic white lesion**
29. Galvanic white lesion - buccal mucosa
30. Diagnostic criteria for **cheek/lip biting lesion**
31. Lip biting lesion
32. Cheek biting lesion
33. Lesions to be covered under subdivision "local etiology not present"
34. Diagnostic criteria for **leukoplakia**
35. Diagnostic criteria for leukoplakia (continued)
36. Diagnostic criteria for leukoplakia (continued)
37. Diagnostic criteria for leukoplakia (continued)
38. Leukoplakia - homogeneous
39. Leukoplakia - homogeneous
40. Leukoplakia - homogeneous
41. Leukoplakia - non-homogeneous
42. Leukoplakia - homogeneous

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT (continued)

43. Leukoplakia - non-homogeneous
44. Leukoplakia - non-homogeneous
45. Leukoplakia - non-homogeneous
46. Leukoplakia - non-homogeneous
47. Diagnostic criteria for **lichen planus**
48. Diagnostic criteria for lichen planus (continued)
49. Diagnostic criteria for lichen planus (continued)
50. Lichen planus - reticular
51. Lichen planus - reticular
52. Lichen planus - reticular
53. Lichen planus - reticular
54. Lichen planus - reticular
55. Lichen planus - plaque-like with striae
56. Lichen planus - tongue lesion
57. Lichen planus - erosive/ulcerative type
58. Lichen planus - erosive/ulcerative type
59. Lichen planus - bullous type
60. Diagnostic criteria for **chronic hyperplastic candidiasis**
61. Chronic hyperplastic candidiasis - tongue lesion (median rhomboid glossitis)
62. Chronic hyperplastic candidiasis - tongue lesion
63. Lesions covered under "red lesions"

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT (continued)

64. Diagnostic criteria for **acute atrophic candidiasis**

65. Acute atrophic candidiasis - palatal lesion

66. Diagnostic criteria for **erythroplakia**

67. Erythroplakia - buccal mucosa and vestibule

68. Erythroplakia - buccal mucosa and vestibule

69. Erythroplakia - for purposes of this survey, this clinical presentation will be referred to as erythroplakia

70. Lesions covered under "denture-related lesions"

71. Diagnostic criteria for **denture stomatitis**

72. Denture stomatitis - Type 1

73. Denture stomatitis - Type 2

74. Denture stomatitis - Type 3

75. Diagnostic criteria for **denture hyperplasia**

76. Denture hyperplasia - without denture

77. Denture hyperplasia - with denture in place

78. Diagnostic criteria for denture ulcer

79. * Denture ulcer

80. Lesions covered under "perioral/other conditions"

81. Diagnostic criteria for **actinic keratosis**

82. Actinic keratosis

*** Slide missing**

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT (continued)

83. Actinic keratosis

84. Actinic keratosis - possible epidermoid carcinoma

85. Diagnostic criteria for **angular cheilitis**

86. Angular cheilitis

87. Angular cheilitis

88. Lesions covered under "tongue lesions"

89. Diagnostic criteria for **fissured tongue**

90. Fissured tongue

91. Diagnostic criteria for **geographic tongue**

92. Geographic tongue

93. Geographic tongue

94. Diagnostic criteria for **hairy tongue**

95. Hairy tongue

96. Diagnostic criteria for **median rhomboid glossitis**

97. Median rhomboid glossitis

98. Lesions covered under "ulcerative conditions"

99. Diagnostic criteria for **acute necrotizing ulcerative gingivitis (ANUG)**

100. ANUG

101. ANUG

102. Diagnostic criteria for **herpetic gingivostomatitis**

103. Herpetic gingivostomatitis

104. Herpetic gingivostomatitis - note vesicles

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT (continued)

105. Diagnostic criteria for **herpes labialis**

106. Herpes labialis

107. Herpes labialis

108. Diagnostic criteria for **recurrent aphthous ulcerations (RAU)**

109. RAU

110. RAU

111. RAU

112. Types of lesions that may fall under **non-specific ulcers**

113. Trauma-induced ulcer

114. Trauma-induced healing ulcer

115. Tooth-brushing induced ulceration

116. Lesions to be covered under "elevated lesions"

117. Diagnostic criteria for **gingival hyperplasia**

118. Gingival hyperplasia - hydantoin

119. Gingival hyperplasia - cyclosporin

120. Gingival hyperplasia - cyclosporin

121. Diagnostic criteria for **mucocele**

122. Mucocele

123. Ranula

124. Diagnostic criteria for **focal epithelial hyperplasia (FEH)**

125. FEH - buccal mucosa

126. FEH - tongue

SLIDE LIST

ORAL MUCOSAL TISSUE ASSESSMENT (continued)

127. Diagnostic criteria for **papilloma**

128. Papilloma - palate

129. Papilloma - palate

130. Diagnostic criteria for **verruca vulgaris**

131. Verruca vulgaris - commissure

132. Types of elevated/tumor-like lesions - all to be diagnosed as tumor (non-specific)

133. Fibroma

134. Fibroma

135. Peripheral giant cell granuloma

136. Lymphangioma

137. Lymphangioma

138. Hemangioma

139. Hemangioma

140. Lesions covered under "pigmented lesions"

141. Diagnostic criteria for **amalgam tattoo**

142. Amalgam tattoo - between bicuspids

143. Amalgam tattoo - between bicuspids

144. Diagnostic criteria for **nevi**

145. Nevus

MUCOSA

SLIDES

HERE

5.5.7 Oral Mucosal Tissue Lesion Data Forms (Dental Examination Form - page 3)

Each SP two years and older receives an oral mucosal tissue examination. The dental examiner asks the recorder to indicate yes (Y) or no (N) for the examination on the top part of the Dental Examination Form - page 1. (See Exhibit 5-7.) If the examiner identifies one or more oral lesions or conditions in the SP's mouth, the examiner will tell the recorder to fill in the number "1," "2," or "3 or more" under "Forms" in the same box, on the top of the Dental Examination Form - page 1 and then turn to the Oral Mucosal Tissue Form (Dental Examination Form - page 3. See Exhibit 5-8). Each Oral Mucosal Tissue Form can be used for only one lesion/condition; if more than one lesion/condition is identified, additional forms must be used. The SP's name, ID number, age, sex, and date of exam must be recorded on each soft-tissue form.

The following sections must be completed by the recorder.

- **Top of the form**: Record the SP's first and last names, SP ID number, and the date (month, day, and year). Fill in the appropriate circles for the SP's ID number, age, and sex.
- **Location**: An oral cavity diagram for specifying the location of the lesion or condition.
- **Clinical diagnosis.**
- **Clinical description**: This section is completed only if the examiner could not make a specific clinical diagnosis based on the brief examination of the SP's mouth or if any of the following conditions (marked "CD") are found: candidiasis, erythroplakia, leukoplakia, lichen planus, tumors, ulcers, and unknown lesions.

The Location, Clinical Diagnosis, and Clinical Description Sections are described in more detail below.

- **Location of Lesion/Condition**. The examiner tells the recorder where the lesion/condition is located in the SP's mouth. The recorder fills in the circle(s) in the area(s) which is/are closest to where the examiner identified the lesion. At least one location must be marked, and it is possible to mark more than one location.

Exhibit 5-7

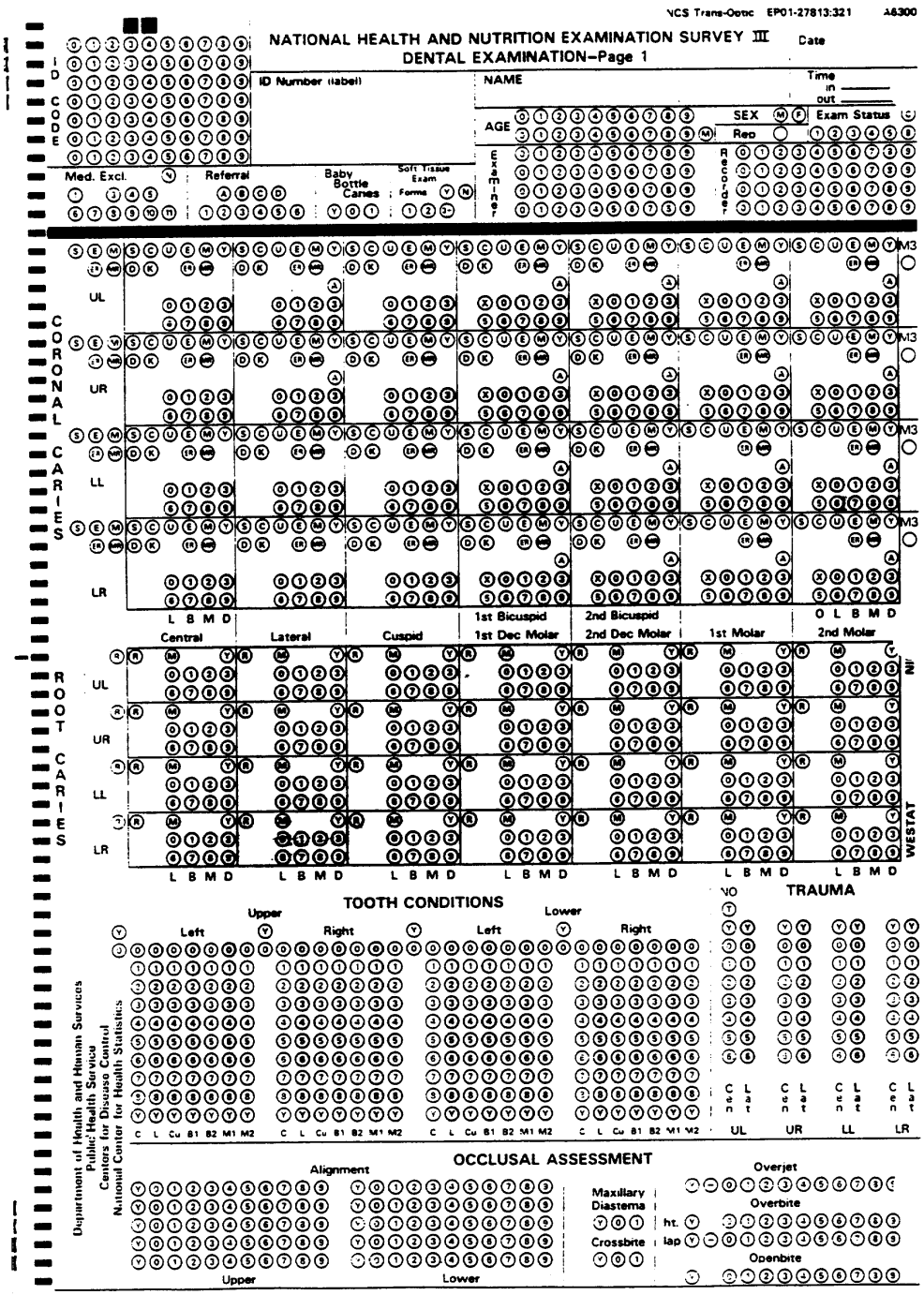

NCS Trans-Optic EP01-27813:321 A6300
NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION–Page 1
Date
ID Number (label)
NAME
Time in out
AGE
SEX
Exam Status
Rec
Med. Excl.
Referral
Baby Bottle Caries
Soft Tissue Exam
Forms
Examiner
Recorder
ID CODE
CORONAL CARIES
ROOT CARIES
UL
UR
LL
LR
L B M D
Central
Lateral
Cuspid
1st Bicuspid
1st Dec Molar
2nd Bicuspid
2nd Dec Molar
1st Molar
2nd Molar
O L B M D
NHANES III
WESTAT
TOOTH CONDITIONS
Upper
Lower
Left
Right
TRAUMA
C L Cu B1 B2 M1 M2
Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics
OCCLUSAL ASSESSMENT
Alignment
Upper
Lower
Maxillary Diastema
Crossbite
Overjet
Overbite
ht.
lap
Openbite

Exhibit 5-8

NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION—Page 3

ID CODE

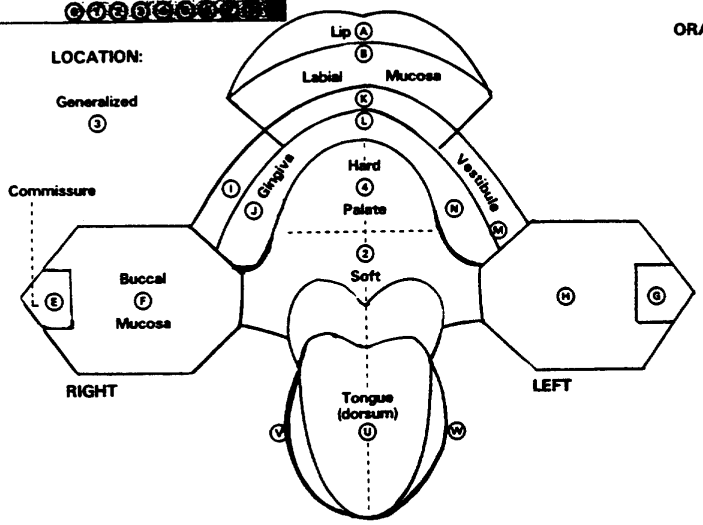
NAME | Date | ID Number

AGE: TENS 0 1 2 3 4 5 6 7 8 9 | UNITS 0 1 2 3 4 5 6 7 8 9

SEX: ○ Male ○ Female

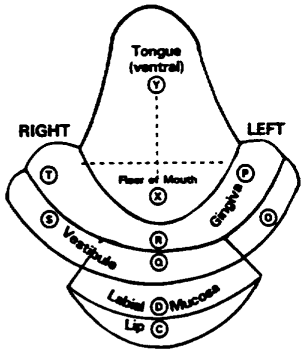
LOCATION:

Generalized ③



ORAL MUCOSAL TISSUE EXAMINATION

S-Smear Y N



CLINICAL DIAGNOSIS:

○11 Actinic Keratosis R	○25 Gingival hyperplasia	○36 Smokeless tobacco, Deg 1
○12 Acute necrotizing ulcerative gingivitis	○26 Herpes labialis	○37 Smokeless tobacco, Deg 2
○13 Amalgam tattoo	○27 Herpetic gingivostomatitis	○38 Smokeless tobacco, Deg 3/4 R
○14 Angular cheilitis S		
○15 Candidiasis, pseudomembranous CD, S, R	○28 Leukoplakia, homogeneous CD, S, R	○39 Tongue, fissured
○16 Candidiasis, erythematous CD, S, R		○40 Tongue, geographic
○17 Cheek/Lip biting	○29 Leukoplakia, non-homogeneous CD, S, R	○41 Tongue, hairy
○18 Denture hyperplasia	○30 Lichen planus CD, S, R	○42 Tongue, median rhomboid glossitis S
○19 Denture stomatitis Type 1–2 S		
○20 Denture stomatitis Type 3 S	○31 Mucocele	○43 Tumor (non-specific) CD, R
○21 Denture ulcer	○32 Nevus R	○44 Ulcer (non-specific) CD
○22 Erythroplakia CD, S, R	○33 Nicotinic stomatitis	○45 Unknown CD
○23 Frictional white lesion	○34 Papillomas/warts	○46 Other diagnosis
○24 Galvanic white lesion	○35 Recurrent aphthous ulceration	

Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics

WESTAT NIDR

NOTICE - Information contained on this form which would permit identification of any individual or establishment has been collected with a guarantee that it will be held in strict confidence, will be used only for purposes stated for this study, and will not be disclosed or released to others without the consent of the individual or the establishment in accordance with section 308(d) of the Public Health Service Act (42 USC242m).

CLINICAL DESCRIPTION: CD

I 1. ○ Single 2. ○ Multifocal 3. ○ Generalized

II Size: L ⓪①②③④⑤ ⓪①②③④⑤⑥⑦⑧⑨ mm W ⓪①②③④⑤ ⓪①②③④⑤⑥⑦⑧⑨ mm H ⓪①②③④⑤ ⓪①②③④⑤⑥⑦⑧⑨ mm

III Surface morphology: 1. ○ Elevated 2. ○ Vesicle/Bulla 3. ○ Nonelevated 4. ○ Ulcer 5. ○ Other

IV Color: 1. ○ Normal 2. ○ White 3. ○ Red 4. ○ Blue 5. ○ Brown/Black 6. ○ Other

V Consistency: 1. ○ Soft 2. ○ Firm 3. ○ Fluid-filled 4. ○ N/A 5. ○ Other

VI Pain: 1. ○ Yes 2. ○ No 3. ○ Don't know 4. ○ N/A

VII Duration of Lesion: 1. ○ < 1 week 2. ○ 1 week—< 1 month 3. ○ 1 month—< 6 months 4. ○ 6-12 months 5. ○ > 12 months to 2 years 6. ○ more than 2 years

VIII Prior history: 1. ○ Yes 2. ○ No 3. ○ Don't know 4. ○ N/A

Comments

032016

- **Clinical Diagnosis**. The examiner tells the recorder which clinical diagnosis to mark, and the recorder marks the appropriate circle. At least one circle must be marked, and only one diagnosis can be marked on a form. If the examiner tells the recorder a condition which is not one of the conditions listed, the recorder fills in the circle for "Other" and writes the name of the condition on the designated line. (Many dental terms are very technical; therefore if the recorder is unsure of the spelling of the condition, s/he should be sure to ask the examiner). When a clinical diagnosis cannot be made, the recorder marks the circle for "Unknown" and completes the Clinical Description portion on the back of the form according to the examiner's directions. The Clinical Description section must only be completed if a diagnosis could not be made or if it is one of the conditions mentioned earlier.

- **Clinical Description**. The examiner indicates which condition to check for each line of the Clinical Description. The examiner may wish to look at the form directly and call off the number of the circle to be marked. Otherwise, the recorder may prompt with the category of each line. Only one mark per line is possible. Spaces after "Other" should be filled as necessary.

- **Comments**. If the examiner wants the recorder to record additional information, it should be recorded in the comments section. Only the lower 1/2 inch of the second page should be used to write comments.

- **Smears**. The following lesions identified by an S under Clinical Diagnosis are to be smeared for candidiasis. At the top of page 3 under smear, mark "Y" or "N" to indicate whether or not the smear was taken. The recorder completes the Transmittal Sheet for any smears taken.

  Angular cheilitis
  Candidiasis
  Denture stomatitis
  Erythroplakia
  Leukoplakia
  Lichen Planus
  Median Rhomboid glossitus

- **Referral**

5.6 Dental Caries Assessment Methods

5.6.1 Introduction

The objectives of the dental caries component of the survey are to:

- Establish age-specific data for the prevalence of dental caries in a national sample;
- Provide a basis for comparisons with past and future national dental caries surveys;
- Provide baseline data for possible followup of selected subsamples;
- Provide a basis for the development of estimates of treatment needs; and to
- Provide a basis for studying the association between dental caries prevalence and risk factors.

There are three parts to the dental caries examination: coronal caries, root surface caries and baby bottle tooth decay.

(a) Coronal Caries: Diagnostic Criteria

With certain exceptions, diagnostic criteria for the coronal caries examinations are those developed by Radike, et al., as published in the Proceedings of the Conference on Clinical Testing of Cariostatic Agents, sponsored by the American Dental Association in 1968.

With minor modifications, the diagnostic criteria for coronal caries have been used in several state-wide surveys and in the following national surveys:

- NHANES I (1970-74);
- NIDR National Dental Caries Prevalence Survey in U.S. School Children (1979-80);
- Hispanic HANES Survey;
- NIDR National Survey of Oral Health in U.S. Employed Adults and Seniors (1985-86); and

- NIDR National Survey of Oral Health in School Children (1986-87).

(b) Root Caries: Diagnostic Criteria

The diagnostic criteria for root caries were used in the NIDR National Survey of Oral Health in U.S. Employed Adults and Seniors (1985-86).

(c) Nursing Bottle Tooth Decay: Diagnostic Criteria

Nursing bottle tooth decay has not been addressed in previous national surveys. For children ages 12-24 months, the presence of dental caries on the four maxillary incisors will be noted. For all age groups 2-6 years, the presence of baby bottle tooth decay will be determined from the coronal caries examination findings for deciduous teeth.

5.6.2 Dental Caries Examination Procedures

In conducting the examinations, an effort should be made to examine each subject in the same manner. An examiner should avoid the temptation to examine more thoroughly a subject who appears to be highly susceptible to caries, or less thoroughly a person who appears less susceptible. The caries examination sequence should follow the sequence shown on the data forms. The forms are arranged by quadrants; the examiner starts with the upper left central incisor and continues distally through the second molar in the same quadrant. The same sequence is followed for the upper right, lower left, and lower right quadrants. At the end of each quadrant the examiner notes the presence or absence of the third molar for that quadrant. Tooth surfaces are examined in the following order: lingual, labial, mesial, and distal for anterior teeth, and occlusal, lingual, buccal, mesial, and distal for posterior teeth. It is not advisable to call out individual surface codes as each tooth surface is examined, as this can be confusing to the recorder. It is better for the examiner to mentally accumulate surface calls for a given tooth until all surfaces have been examined before dictating the calls to the recorder.

5.6.3 Coronal Surface Caries Assessment Diagnostic Criteria

Decayed Tooth Surfaces (The D Component of the Index). Frank lesions are detected as gross cavitation and thus present few problems in diagnosis. Incipient lesions, on the other hand, are more difficult to diagnose consistently. Incipient lesions may be subdivided into three categories according to location, each with the following special diagnostic considerations:

1. Pits and fissures on occlusal, buccal and lingual surfaces: These areas are diagnosed as carious when the explorer catches after insertion with moderate, firm pressure and when the catch is accompanied by one or both of the following signs of caries:

    a. Softness at the base of the area.

    b. Opacity adjacent to the area providing evidence of undermining or demineralization.

    In other words, a deep pit or fissure in which the explorer catches is not in itself sufficient evidence of decay; it must be accompanied by at least one of the above signs.

2. Smooth areas on buccal (labial) or lingual surfaces: These areas are carious if they are decalcified or if there is a white spot as evidence of subsurface demineralization and if the area is found to be soft by:

    a. Penetration with the explorer, or

    b. Scraping away the enamel with the explorer.

    These areas should be diagnosed as sound when there is only visual evidence of demineralization.

3. Proximal surfaces: For areas accessible to direct visual and tactile examination, as when there is no adjacent tooth, the criteria are the same as those for smooth areas on facial or lingual surfaces. For areas not available to direct examination, other criteria must be applied. In anterior teeth only, transillumination can serve as a useful aid in discovering proximal lesions. Transillumination is achieved by placing a mirror lingually and positioning the examining light so that it passes through the teeth and reflects into the mirror. If a characteristic shadow or loss of translucency is seen on the proximal surface, then this is indicative of caries on the surface. Ideally, the actual diagnosis should be confirmed by detecting a break in the enamel surface with the explorer; however, clear visualization of a lesion by transillumination can justify a positive diagnosis. In posterior teeth, however, visual evidence alone, such as undermining under a marginal ridge, is not sufficient proof for diagnosing a proximal

lesion. A positive diagnosis is made only if a break in the enamel surface can be detected with the explorer.

Missing Teeth (the M and E Component of the Index). This component traditionally represents those permanent teeth that have been extracted only as a result of caries. However, because of the difficulty of correctly distinguishing between teeth extracted due to caries and those extracted for periodontal reasons, no attempt will be made at the time of the examination to differentiate between these two causes of tooth loss. It is essential, however, to distinguish between teeth extracted because of caries or periodontal disease and those extracted or missing for other reasons. The code "E" will be used to indicate teeth extracted because of caries or periodontal disease, and a different code, "M", will be used for teeth missing due to trauma, orthodontic treatment, or other non-disease related causes. In order to determine whether an "E" or "M" is called, the SP should be asked about the reason for tooth loss. Unerupted or congenitally missing teeth (code "U") must also be correctly identified.

When a missing tooth has been replaced by a fixed or removable prosthesis, the "E" or "M" score will be supplemented with the letter "R" (for "replaced"), creating the scores "ER" and "MR." A fixed or removable prosthetic replacement is considered to exist when it is visible in the mouth. In the case of removable appliances not being worn at the time of examination, the replacement is considered to exist when the examinee reports the existence of an appliance which the SP upon questioning states that he/she wears (however infrequently).

When a replacement exists, the examiner will not consider its condition or adequacy when making the call. When a replacement does not exist, the examiner will not attempt a clinical judgment of the need or adequacy of space for a replacement, even if the space has been closed by tooth movement.

When more than one tooth has been replaced by a single pontic, each tooth space will be scored as replaced.

Note: The "R" designator is used only in conjunction with the "E" and "M" scores, and consequently does not apply to the deciduous dentition, or to unerupted teeth (code "U").

Filled Tooth Surfaces (the F Component of the Index). The F component represents a tooth surface that has been filled with either a permanent or a temporary restoration as a result of caries involvement. Here also it is necessary to distinguish between surfaces restored for caries and those restored for other reasons, such as trauma, hypoplasia, malformation, or bridge abutment.

Guidelines for Scoring. The following conventions have been adopted in the interest of achieving diagnostic consistency:

1. Incisal edges of anterior teeth are not considered to be separate surfaces. If a lesion or restoration is confined solely to the incisal edge its score should be assigned to the nearest adjacent surface. Thus, anterior teeth have only four scorable surfaces (mesial, distal, labial, and lingual). The inclusion of the occlusal surface for posterior teeth gives those teeth five surfaces.

2. When a caries lesion extends beyond the line angle onto another surface, that surface is also scored as carious.

   For restorations, however, the following rules apply:

   On anterior teeth, a proximal filling is not considered to involve the adjacent labial or lingual surface unless it extends at least one-third of the distance to the opposite proximal surface. The reason for this criterion is that tooth structure on labial or lingual surfaces of anterior teeth must often be removed to provide access for the proximal restoration.

   On posterior teeth, to guard against a similar possibility of overcalling, a proximal restoration should extend more than a millimeter past the line angle before it is considered to involve the adjacent buccal or lingual surface.

3. If a permanent tooth has a full crown restoration placed because of caries, the tooth will be coded as C, which represents the maximum number of surfaces for the tooth type, i.e., four surfaces on anterior teeth and five surfaces on posterior teeth. By convention, all full crowns on posterior teeth, including abutment teeth for fixed or removable prostheses, are considered to have been placed as a result of caries. On anterior teeth, however, the examiner should make a determination of the reason for crown placement. If it can be determined that the crown was placed solely for a reason other than caries, such as fracture, malformation or bridge abutment, the tooth is coded Y.

For three-quarter crowns, the following rules apply:

In general, if a tooth has been restored with less than full coverage, each surface is examined and scored in the usual manner. However, when the crown coverage extends onto the buccal (labial) or lingual surface for cusp protection, the surface is not scored as restored unless the coverage extends more than two millimeters cervically from the cusp tip or incisal edge.

For three-quarter crowns used as abutment teeth, all surfaces are scored in the usual manner if the abutment is a posterior tooth. On anterior teeth, if it can be determined that the crown was placed solely for purposes of abutment and not for caries, the restoration will not be scored, but surfaces without crown coverage will be examined and scored in the usual manner.

4. Teeth that are banded or bracketed for orthodontic treatment are examined in the usual manner and all visible surfaces are scored.

5. Certain teeth, notably first bicuspids, may have been extracted as part of orthodontic treatment. These teeth are coded M and will be excluded from the DMFS analysis. The examiner must make the determination that the teeth were in fact extracted for orthodontic reasons, although this is not usually difficult because of the typically symmetric pattern of these extractions. For the sake of uniformity, all orthodontically extracted bicuspids are scored as first bicuspids. Teeth other than bicuspids may also be extracted for orthodontic reasons. In many cases the subject will have good recall of the reason for the extractions, and can help in making the correct determination.

6. Non-vital teeth are scored in the same manner as vital teeth. If, however, a restoration on a non-vital tooth was placed solely to seal a root canal and not for caries, that restoration will not be scored. If no other lesions or restorations are present, the tooth will be called sound (S).

7. Hypoplastic teeth are scored in the usual manner. However, if it can be determined that a restoration on such a tooth was placed solely for esthetic reasons and not for caries, that restoration will not be scored. If a hypoplastic tooth is restored with a full crown, it is to be coded Y.

8. Malformed teeth are scored in the usual manner except when they have been restored with a full crown for esthetic reasons, in which case they are coded Y.

9. When the tooth crown is destroyed by caries and only the roots remain, score all surfaces carious (X, 0, 1, 2, 3 on posterior teeth and 0, 1, 2, 3 on anteriors).

10. When the same tooth surface is both carious and filled, only the caries is scored.

11. Fractured or missing restorations are scored as if the restoration were intact unless caries is found to be present. In that case, the involved surface is scored as carious rather than restored.

12. In the case of supernumerary teeth, only one tooth is scored for the tooth space. The examiner must decide which tooth is the "legitimate" occupant of the space.

13. If both a deciduous and a permanent tooth occupy the same tooth space, only the permanent tooth is scored.

14. Third molars are not scored. When examining second molars it is important to note that a drifted third molar may occupy the space of a missing second molar. In such cases, the diagnosis and score must relate to the status of the missing second molar, not the third molar. If the second molar, for example, was extracted due to caries and the space is now occupied by a sound third molar, the second molar is scored as extracted (E) and the third molar is not scored.

15. A tooth is considered to be in eruption when any part of its crown projects through the gum. This criterion is easier to standardize than one based on a more advanced stage of eruption.

16. Stain and pigmentation alone should not be regarded as evidence of caries as either can occur on sound teeth.

Scoring Deciduous Teeth. Decayed or filled surfaces of deciduous teeth are scored in the same manner as permanent teeth, using the same diagnostic criteria. However, because this survey is concerned with both deciduous and permanent teeth, it will be necessary to call sound deciduous teeth with a "deciduous" score (D) to distinguish them from sound permanent teeth. The K code will be used for deciduous teeth with restorations or caries and will precede any other legitimate diagnostic call for decayed or filled surfaces. For example, if a deciduous molar has occlusal caries and is otherwise sound, the K code would be combined with the code for occlusal caries (i.e., K, X). If the deciduous tooth is sound, the D code is used alone.

Missing deciduous teeth present potential problems in scoring because it is often not possible to distinguish exfoliated teeth from those extracted due to caries, especially during the period of mixed dentition. To avoid this problem, at the time of examination, all missing deciduous teeth are scored as unerupted permanent teeth (U). When data are analyzed, the age of the subjects can be used to determine the most likely reason for tooth loss.

Note again that if both a permanent and a deciduous tooth are visible in the same tooth space, only the status of the permanent tooth is described and no score is assigned for the deciduous tooth.

Recording the Presence of Fissure Sealant. The presence of adhesive fissure sealant is to be recorded for specified posterior teeth and maxillary lateral incisors, using the code A. These teeth are identified on the data form by the letter A, which appears at the middle of the tooth box for the selected teeth. If a permanent tooth is sound and sealed, the A would be called and marked in addition to the S. If the permanent tooth has scores for individual sites, then the A would be called in addition to, and after any other score for the surfaces on that tooth.

It is important to be aware that sealant products may vary in appearance, from clear to colored or white. Sealant should be scored as present when any part of the surface remains covered. If it appears that sealant material was used as a restoration rather than as a preventive procedure, score the surface as filled and do not record the presence of sealant.

5.6.4 Root Surface Caries Assessment Diagnostic Criteria

Caries occurs in root surfaces of teeth only where there has been loss of normal gingival attachment (apical recession from the cemento-enamel junction). Generally, caries in root surfaces occurs coronal to the present gingival margin; very few lesions exist solely in the gingival pocket. Although all exposed root surfaces are susceptible, it has been reported that caries predominantly occurs in approximal and buccal aspects.

Root caries starts at or just below the cemento-enamel junction (CEJ). Most commonly, early root caries lesions are small and round. However, they may spread laterally along the cervical junction, sometimes coalescing with neighboring lesions to produce a collar of caries around the root. Caries that begins in a root surface does not tend to affect the adjacent coronal enamel surface directly. Rather, it may undermine the cervical enamel and invade coronal dentin, leaving a cervical enamel spur or ledge. If the carious process continues, pieces of this ledge may fracture, making it appear as if caries had originated in the enamel as well as the cementum. The opposite sequence can occur as well, with cervical coronal caries spreading apically to involve the CEJ and then the root surface. Whenever both the coronal

and root surfaces are affected by a single caries lesion that extends at least 1 mm past the CEJ in both incisal and apical directions, both surfaces should be scored as decayed. However, for a lesion affecting both crown and root surfaces that extends less than 1 mm in either direction, the surface on the side of the CEJ that involves more than 50 percent of the area of the lesion should be scored. When it is impossible to apply the ">50% rule," i.e., both coronal and root surfaces appear equally affected, both surfaces should be scored "decayed." For restorations, the same rules apply. See Exhibit 5-9 for coronal caries code sheet.

Exhibit 5-9. Coronal caries code sheet

CODE SHEET

Tooth Status	**Code**
Sound permanent tooth (no caries or restoration)	S
Deciduous tooth (no caries or restoration)	D
Full crown	C
Unerupted	U
Missing, without replacement	
Due to caries or periodontal disease	E
Missing for other reasons	M
Missing, with prosthetic replacement	
Due to caries or periodontal disease	ER
Missing for other reasons	MR
Exclusion (tooth cannot be scored)	Y
Surface Status	
Caries	
Occlusal surface	X
Lingual surface	0
Buccal surface	1
Mesial surface	2
Distal surface	3
Restorations	
Occlusal surface	5
Lingual surface	6
Buccal surface	7
Mesial surface	8
Distal surface	9
Sealant (coded in addition to any other tooth or surface status calls)	A

*(for deciduous teeth, call K prior to surface status codes)

Exhibit 5-9. Coronal caries code sheet (continued)

Quadrant Status	
All teeth in quadrant are sound	S
All teeth in quadrant are missing due to disease	E
All teeth in quadrant are missing due to other reasons	M
All teeth missing due to disease **and** replaced	ER
All teeth missing due to other reasons **and** replaced	MR

NHANES III ORAL HEALTH SURVEY METHODS

SLIDES ILLUSTRATING

DMFS ASSESSMENT FOR CORONAL CARIES

1. Subjects should be examined with a sharp, #23, sickle-shaped explorer and unmarred, non-magnifying, front surface mirror. Ideally the teeth should be dried before examining each quadrant.

2. The recorder should be positioned within easy hearing distance of the examiner. The portable chair should be set at a height that is comfortable and compatible with the height of the stool. Instruments and other necessary materials are placed on a table within easy reach of the examiner.

3. If the light is properly placed, subtle adjustments of the mouth mirror should allow for transillumination of approximal surfaces of anterior teeth from the lingual. This technique is used only on anterior teeth.

4. Caries is present in the pits and fissures of the occlusal surfaces of the molar and the bicuspid. Each of these teeth would receive a score of X. The buccal surface of the molar would be scored as a 1 if caries is confirmed with the explorer. It appears that undermining is present on the mesial surface of the first molar, however, the status of this surface must be confirmed with the explorer before assigning a score.

5. The second bicuspid has a large caries lesion that extends beyond the line angle onto the buccal surface. The tooth would be scored as X, 1, 3 to indicate involvement of the occlusal, buccal and distal surfaces.

6. Stained pits and fissures, per se, do not constitute a positive diagnosis for caries. However, if caries is confirmed by the explorer on the buccal and occlusal surfaces of the lower molar, a score of X, 1 would be assigned. The bicuspids appear to be sound, and would be assigned a score of S.

7. The lateral incisor has labial caries associated with hypoplastic pits. A score of 1 would be given to indicate the location of the lesion.

8. If the lingual pits in the lateral incisors were found to be carious with the explorer, those surfaces would be assigned a score of 0.

9. Decalcification and possible caries are present on the labial surface of the lateral incisors. No score would be given for decalcification or white spot lesions, in the absence of softness. However, if the enamel shows softness or can be scraped away with an explorer, a score of 1 would be given to these surfaces.

10. The interproximal lesion on the mesial of the lateral incisor would be scored a 2. On anterior teeth, clear visualization of a lesion by transillumination can justify a positive diagnosis.

11. Only the roots are remaining for the first bicuspid and first permanent molar. A shell of the second

bicuspid is present. These teeth would be scored as all surfaces carious (X, 0, 1, 2, 3).

12. The distal and occlusal surfaces of the first bicuspid and the occlusal surface of the first molar have been restored. The first bicuspid would be scored 5, 9 and the first molar would be scored 5. The second bicuspid would be scored S, indicating that all surfaces are sound.

13. Composite restorations can be noted on the upper lateral and cuspid. The mesial and distal of the lateral would be scored 8 and 9, respectively, and the mesial of the cuspid would be scored 8. The labial surfaces are not scored because the restoration does not extend one-third of the distance across the surface.

14. If the restoration on the central incisor had been placed because of caries, it would be scored as 6, 7, 8 indicating involvement of the lingual, labial and mesial surfaces. (There is no score for incisal surfaces.) If it had been placed only to restore a fracture, the filling would be ignored and the tooth scored as sound (S).

15. The upper first molar has a large restoration involving the occlusal, lingual, buccal and mesial surfaces (5, 6, 7, 8). Even though two restorations are present on the buccal surface of the lower molar, a single call of 7 would be given, unless obvious caries exists. Then, the caries would take precedence and the surface would be scored a 1.

16. Fractured amalgams are present in the first and second molars. If caries were not detected, each tooth would be scored 5, 8, as though the restorations were still intact and present. If caries were found in the approximal areas where the restorations are missing, the teeth would be scored as 2, 5.

17. A distal-occlusal restoration with a hairline fracture is present in the bicuspid. This tooth would be scored 5, 9 as if no fracture were present, unless obvious caries was detected.

18. The mesial surfaces of both bicuspids have restorations as well as obvious caries. The caries would take precedence and these surfaces would be given a score of 2.

19. The reason for the crown on the central incisor must be determined. If it were placed because of caries, the tooth would be scored a C. A score of Y would be assigned if the crown were placed to restore a fracture, or for other non-disease related reasons.

20. Each of the crowned molars would receive a score of C. For the three-quarter crowns on the bicuspids, all surfaces except the buccal would be scored as filled (5, 6, 8, 9). The buccal surface would not be scored as affected unless crown coverage extended more than 2 mm onto the surface.

21. The lower molar was extracted because of caries and would receive a score of E. If the tooth had been extracted for a non-disease related reason, a score of M would be given.

22. The missing teeth were extracted because of periodontal disease. They would be scored the same as for caries (E).

23. Hypoplastic teeth are scored as sound (S) unless caries or a restoration is present. However, a judgment must be made as to whether a restoration was placed because of caries or for esthetic reasons. In the latter case, the restoration would not be scored.

24. Temporary restorations are scored in the same manner as permanent restorations.

25. Composite restorations, or sealants used as filling material, are scored in the same manner as any other restoration.

26. In the absence of caries or restorations, a surface containing a dental sealant would be scored as sound (S). The sealant would be assigned a code of A.

27. A score of C is given to all full crowns placed on posterior teeth, including abutments. On anterior teeth, the score could be either a C or a Y, depending on the reason the crowns were placed.

28. Orthodontically banded teeth are scored as usual on all surfaces visible. If the upper lateral incisors are thought to be congenitally missing, they are scored as unerupted permanent teeth (U).

29. Unrestored fractured teeth are scored as usual on all surfaces. If a full crown had been placed to restore the fracture, the tooth would be scored as a Y. If only the fractured area had been restored, the restoration would be ignored and all other visible areas would be scored as usual.

30. The first primary molar would be scored as K 5, 8, 9 to account for the three-surface restoration. In the second primary molar, the occlusal restoration would be ignored and the tooth would be scored a K X, indicating the presence of occlusal caries.

CORONAL

SLIDES

HERE

Defective margins of fillings with suspicious carious areas should be checked with an explorer for recurrent decay and the criteria for scoring "decayed and filled" root surfaces should be the same as for coronal surfaces, that is, decay takes precedence over a filling. Full crown coverage is considered to be placed for coronal caries even if the margin of the crown extends on to the root surface. Thus, a root surface with a crown margin free of recurrent decay should be scored sound or "R" (no caries or restorations).

Areas of abrasion or erosion in root surfaces rarely become carious because they are generally kept clean and are free of plaque. Root caries frequently occurs beneath plaque, but rarely beneath calculus. Accumulations of plaque which obstruct the examination procedure should be removed. Surfaces covered entirely by calculus are considered sound.

Active caries lesions in root surfaces are yellow/orange, tan or light brown in color. Lesions in remission tend to be darker, sometimes almost black. When root caries is covered by small amounts of plaque, the discoloration of the lesions usually shows through.

In some incipient lesions the carious area of the root surface may merely be discolored without cavitation, but the area will be soft to exploration. Cavitation with jagged margins and a roughened, but soft floor or base usually occurs in advanced lesions. Normal cementum is softer than enamel, and frequently will yield to pressure from the tip of an explorer. Areas of root caries, however, are softer than surrounding cementum; therefore, it is possible to differentiate sound cementum from carious cementum based on tactile sense. In the presence of root caries, an explorer penetrates the tissue but usually can be removed easily. However, if the explorer penetrates but resists withdrawal or "sticks," the surface is usually sound cementum. With experience and training, it is possible to develop a tactile sense to differentiate sound from carious cementum. Note that for areas without gross cavitation, visual criteria related to location, shape and discoloration of the suspected area do not, in themselves, define root caries. The tactile criteria of softness to an explorer tip must be met for a definitive diagnosis of root caries to be made.

For assessing gingival recession and root caries, each tooth is considered to have four surfaces (aspects), irrespective of the number of its roots. These surfaces are: lingual, buccal (labial), mesial, and

distal. Because of the constricted anatomy of the root surfaces of lower incisors, few lesions will be confined solely to the lingual surface -- only small lesions at the midpoint. Most lingual lesions will also affect the adjacent mesial and/or distal root surfaces. However, lesions of the mesial and distal surfaces which extend lingually but do not reach the midline are only scored as interproximal lesions. On all other teeth, when root caries appears to wrap around the line angle of the root, the more involved surface is considered the primary site of the lesion and is scored carious, whereas the adjoining surface is only scored as carious when the lesion clearly extends at least 1 mm past the line angle. The tooth and surface codes for the root caries assessment are identical to coronal caries with the exception of the "R" score which is equivalent to the "S" score indicating a tooth for which all root surfaces are sound.

All exposed portions of a tooth's root surface should be carefully examined. The most difficult areas to examine are approximal surfaces in posterior teeth, particularly those that contain approximal restorations. Subgingival inspection is not recommended because few lesions are confined subgingivally and it may produce bleeding. See Exhibit 5-10, root surface caries code sheet.

Exhibit 5-10. Root surface caries code sheet

CODE SHEET

Tooth Codes	**Code**
Sound (no caries or restorations)	R
Full crown coverage (extending on to root surface with no recurrent decay)	R
Exclusion (tooth or root cannot be scored)	Y
Missing (caries/periodontal diseases)	M
Missing (orthodontic or non-disease)	M
Unerupted	M

Surface Codes	
Caries	
Lingual	0
Buccal	1
Mesial	2
Distal	3
Restorations	
Lingual	6
Buccal	7
Mesial	8
Distal	9

SLIDES ILLUSTRATING DMFS

ASSESSMENT OF ROOT CARIES

1. Instrumentation

   Subjects will be examined with the same instruments used for the DMFS assessment of coronal caries -- the #23 explorer and the non-magnifying, front surface mirror. Ideally, the teeth should be dried before examining each quadrant.

2. No Apparent Recession

   Each tooth in the quadrant, excluding third molars, will be checked for root caries in the same sequence that was utilized for coronal caries. If no recession were found on the root surfaces of a tooth, a call of "R" would be made indicating a sound root. Knowledge of the curvature of the CEJ for each tooth type is essential for the determination of recession. (See Appendix A.)

3. Presence of Plaque and Soft Accumulations

   Soft debris is visible on the upper and lower anterior teeth. Because root caries is often found under plaque, the examiner should remove any soft debris that hinders the visual and tactile examination of the root surface. Soft debris should be removed with a gauze square.

4. Presence of Calculus

   Calculus is present at the cervical area of the lower cuspid and bicuspid. Because root caries seldom occurs beneath calculus, the underlying surface is presumed to be sound.

5. Mild Recession

   Even with minimal recession of the gingival tissues, the cementum of root surfaces becomes susceptible to caries. All surfaces, therefore, with any exposed cementum should carefully be examined. The labial surfaces of the cuspid and first bicuspid show mild recession. If no caries were detected in these teeth, they would each be scored "R."

6. Advanced Recession

   Recession is present on the labial and mesial of the lower central incisors. Calculus is also present. If no caries were detected, each of the incisors would be scored "R."

7. Abrasion and Recession

   The labial surfaces of the anterior teeth and the buccal surface of the bicuspid both show abrasion and recession. Even though the areas of abrasion are usually caries free, the examiner should carefully check such areas. If no caries or restorations were present on these teeth, each would be scored "R."

8. Initial Root Lesion

   A small round discoloration can be observed in the cervical area of the buccal surface of the lower cuspid. If upon exploration, the area is determined to be carious, a score of "1" would be made.

9. Initial Root Lesions

   Note the pinpoint lacy effect of the discolorations along the CEJ of the labial surfaces of the patient's upper right central and lateral incisors. If these areas are found to be carious and if the lesions continue on to the mesial and distal surfaces, a call of "1, 2 and 3" would be made for each of these teeth.

10. Small Root Lesions

    Three stages of lesions can be noted on the rotated second bicuspid: a questionable white spot, a small pinpoint lesion, and a more advanced black lesion. Even if the examiner were to determine that all three areas were carious, a single call of "3" would be made to indicate caries present on the distal surface.

11. Small Root Lesions

    Small lesions can be observed at the CEJ of the patient's upper right cuspid and upper left central incisor. Both crown and root surfaces are involved but neither as much as 1 mm past the CEJ. If for each lesion both crown and root surfaces appear equally involved, i.e., the greater than 50 percent rule is difficult to apply, then both crown and root surfaces would be scored a "1" for each tooth.

12. Advanced Root Lesions

    More advanced lesions can be observed on the upper lateral incisors and lower cuspids. Because the lesions extend 1 mm or more past the CEJ onto both crown and root surfaces, both crown and root surfaces of each tooth should be scored "1."

SLIDES ILLUSTRATING DMFS

ASSESSMENT OF ROOT CARIES (continued)

13. Advanced Root Lesions

Several stages of the development of root lesions are shown. The irregular progressive destruction of advanced root lesions often affects the crown, causing cervical undermining of the enamel. However, only the crowns of the patient's right cuspid and left first bicuspid are clearly involved. Black lesions usually indicate a remission in caries activity. Small circular brown lesions have developed apically next to the receding gingiva. All visible root surfaces would be scored as carious, "1, 2, and 3."

14. Root Restorations

Several teeth with gold foil cervical restorations can be observed. In order to make the appropriate calls for these teeth, it is necessary to locate the CEJ. Restorations that extend 1 mm or more both incisally and apically past the CEJ would be scored as involving both crown and root surfaces. Accordingly, for all restorations with the exception of those in the patient's upper left central and lateral incisors the crown and root surfaces would each be called a "7." Because the crown portion of the restorations on the patient's upper left central and lateral incisors do not extend incisally 1 mm past the CEJ and do not involve more than 50 percent of the area of the restoration only the root surface is called a "7."

15. Root Restorations

Crowns are considered to be placed for coronal caries even if the crown extends onto a root surface. Exposed root surface adjacent to the crowns on the abutment teeth should be examined. If no lesions or restorations are present, the tooth would be called an "R."

16. Surface-specific Scoring

This extracted molar shows caries (red dye) on the lingual surface. Irrespective of the number of roots, the tooth is considered to have four surfaces. The mesial and distal surfaces are not involved. A single score of "0" would be made.

17. Surface-specific Scoring

Caries is present on the lingual surface of the central incisor. If the lesion were judged to clearly extend past the line angle by more than 1 mm then the distal surface would also be called, or a "0, 3."

18. Surface-specific Scoring

    Caries is present on the distal of an anterior tooth. A score of "3" would be given for this surface. Note the pronounced curvature of the CEJ. (The curvature of the CEJ usually is even greater on the mesial.)

19. Surface-specific Scoring

    Several interproximal and cervical lesions can be observed. On the lower anterior teeth, mesial and distal lesions which extend lingually but do not reach the midline are scored only as interproximal lesions. Thus, the lower left cuspid is scored as lingual decay "0," the lateral incisor as distal decay "3," and the central incisor is scored as mesial and distal decay "2, 3." The area on the distal of the lower right central incisor would receive a "3" if determined to be carious.

20. Surface-specific Scoring

    The same dentition as in 19 can be seen after restoration. The patient's left cuspid would be scored as a "6," the left lateral and central would both be scored as "8, 9." The right central would be scored "R" if no decay is detected.

21. Recurrent Decay

    Recurrent caries is present on this extracted upper molar. A single call of "2" should be made. (Decay takes precedence over a restoration.) If the examiner finds that the new decay is separate from the restoration, a call of "2" would still be made. Further, if two restorations were present on the mesial surface, a single score of "8" would be called or if two new lesions were present, a single call of "2" would be made.

22. Recurrent Decay

    Note the two areas of recurrent decay associated with the cervical restoration on the buccal surface of the upper cuspid. Because both recurrent lesions and restoration appear to be confined to the crown, the root would be called an "R" and the buccal surface scored as "1."

23. Recurrent Decay

    The patient's upper left, distally rotated, central incisor also has two areas of recurrent decay associated with a cervical restoration. The labial root surface is scored a "1" because the margin of the restoration on the root has recurrent decay. The labial crown surface is scored a "7." On the mesial surface, more than 50 percent of the recurrent decay appears to involve the root and therefore the root is called a "2" and the crown an "8."

24. Recurrent Decay

The restoration on the patient's upper right lateral incisor appears to have recurrent decay confined to the root surface. If the discolored area is found to be carious, the labial root surface would be called a "2" and the labial crown surface a "7." (Even if the recurrent decay was found to slightly overlap the CEJ onto the crown, more than 50 percent of the lesion would involve the root and the scoring of the labial root and crown surface would still be "1" and "7," respectively.) Distally, it appears that the restoration involves both crown and root (based on 1 mm past CEJ rule) and each surface would be called a "9."

ROOT CARIES

SLIDES

HERE

5.6.5 Nursing Bottle Caries (Baby Bottle Tooth Decay) Assessment

For children older than two years of age, estimates of the prevalence of baby bottle tooth decay will be made from the coronal caries scores for deciduous teeth; a separate examination for this condition will not be necessary. For children from 12 to 24 months of age, however, a visual examination of the maxillary incisors will be conducted and the presence of caries noted.

Nursing Bottle Examination Procedure. Retract the upper lip of the child to provide visual access to the maxillary anterior teeth. Examine all maxillary incisors present for visual evidence of dental caries on labial or approximal surfaces. Tactile criteria should not be applied, and the explorer should not be used in the examination.

Scoring for Nursing Bottle Caries. Maxillary incisors are scored as a group -- individual teeth or tooth surfaces are not scored. For each subject, a score of 0 or 1 will be assigned as follows:

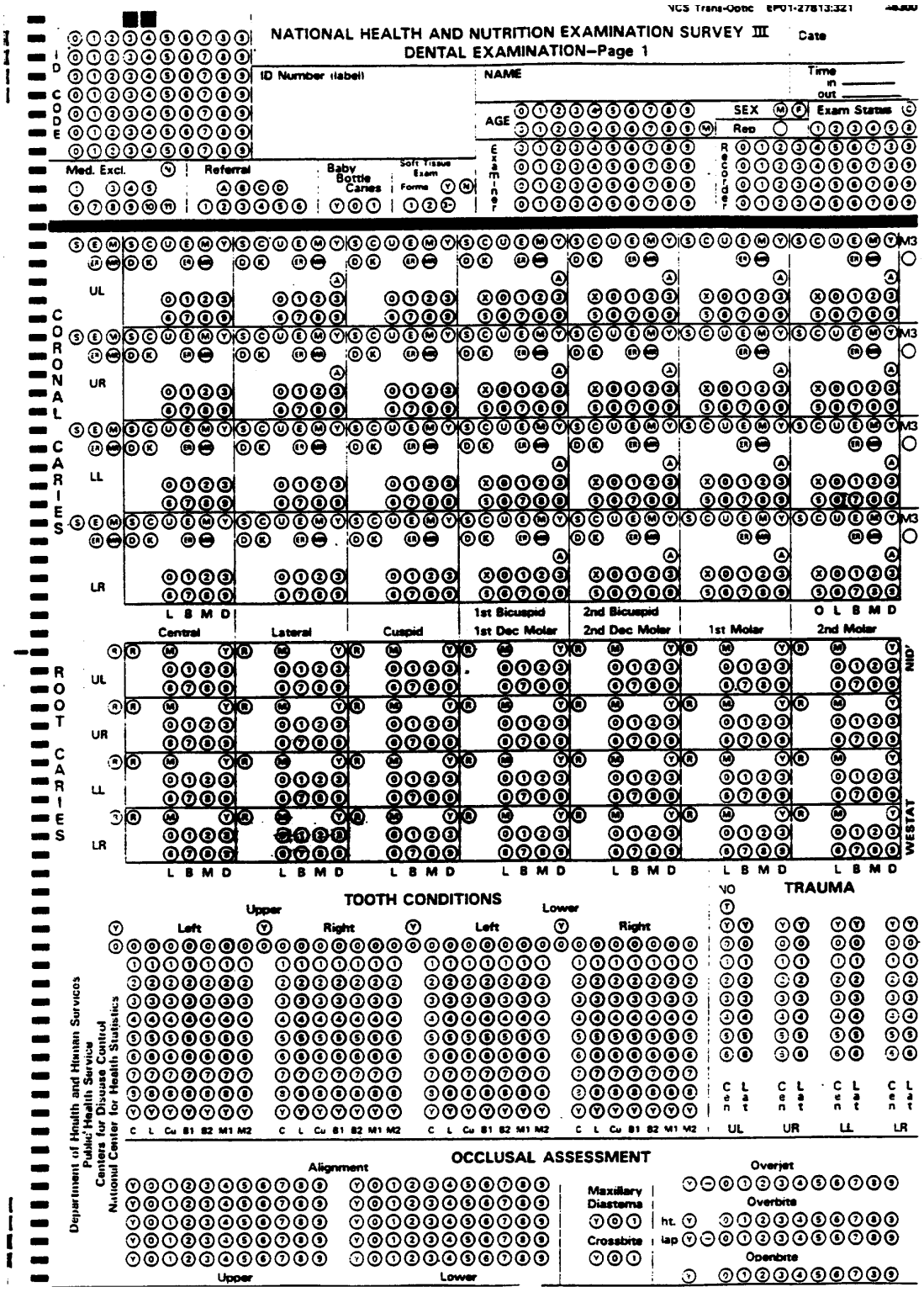
- 0 No visible evidence of caries or restoration was seen on the labial or approximal surfaces of any of the maxillary incisors.
- 1 At least one maxillary incisor showed visual evidence of caries or restoration on a labial or approximal surface.
- Y Subject could not be examined.

5.6.6 Caries Recording Procedures

The Dental Examination Form - page 1 (Exhibit 5-7) is used for recording coronal caries, sealants, and root caries and nursing bottle caries. A maximum of 28 permanent teeth will be scored for an SP (third molars (wisdom teeth) are not scored for dental caries). A maximum of 20 deciduous teeth ("baby teeth") are scored for young SP's. Some SP's will have mixed dentition (permanent and deciduous teeth in the mouth).

Coronal Caries Recording Procedures. The caries area of page 1 is divided horizontally into 4 parts. These 4 parts correspond to the 4 quadrants of the mouth: Upper left, upper right, lower

Exhibit 5-11


NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION–Page 1
ID Number (label)
NAME
AGE
SEX
Exam Status
Time in
Time out
Med. Excl.
Referral
Baby Bottle Caries
Soft Tissue Exam
Forms
Examiner
Recorder
CORONAL CARIES
UL
UR
LL
LR
Central
Lateral
Cuspid
1st Bicuspid
1st Dec Molar
2nd Bicuspid
2nd Dec Molar
1st Molar
2nd Molar
ROOT CARIES
TOOTH CONDITIONS
Upper
Lower
Left
Right
TRAUMA
OCCLUSAL ASSESSMENT
Alignment
Maxillary Diastema
Crossbite
Overjet
Overbite
Openbite
Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics
WESTAT

left, lower right. These quadrants are labelled in the extreme left column of the page.

The examiner conducts the entire coronal assessment beginning with the central incisor in the upper left quadrant, working toward the back of the mouth and ending with the 2nd molar in the upper left quadrant. The examiner then repeats the procedure for the upper right, lower left, and lower right quadrants, always starting with the central incisor and ending with the second molar. The examiner then notes the presence or absence of the third molar at the end of each quadrant. The examiner calls out the code for each tooth, and the recorder marks the circle or circles containing the code. The examiner proceeds to "call" the status of each tooth surface for each of the permanent teeth, excluding "wisdom teeth" (third molars). The recorder records the examiner's calls, beginning with the first box on the left hand side of the caries area of page 1 and proceeding across the row. Each of the boxes on the caries area represents a tooth. Within each box there is space to record information about the condition of each surface on the tooth. The names of the teeth are at the bottom of the area:

Central incisor,
Lateral incisor,
Cuspid,
1st Bicuspid/1st Deciduous Molar,
2nd Bicuspid/2nd Deciduous Molar,
1st Molar, and
2nd Molar.

The top two rows in a box are marked:

S	=	Sound (no decay or filling on any surface),
C	=	Full crown coverage,
U	=	Unerupted tooth,
E	=	Missing (caries/periodontal disease),
M	=	Missing (orthodontic or nondisease),
Y	=	Exclusion (tooth cannot be examined),
D	=	Sound deciduous or "baby tooth",
K	=	Deciduous tooth with surface call(s),
ER	=	Missing (caries/periodontal disease), and
MR	=	Missing (orthodontic or nondisease).

The above codes characterize a whole tooth condition and are referred to as "tooth calls."

If the tooth is permanent with no decay or filling on any surface, the examiner calls "S." The recorder fills in the appropriate space on the top row of the first box. If the tooth is characterized by one of the other "tooth calls," the dentist calls out the appropriate letter, and the recorder fills the appropriate circle in the top row of the box.

The "D" on the second row must be marked for all sound deciduous calls, and the K in the 2nd row is marked if the deciduous call is followed by a surface condition (caries, filled, sealant). For permanent teeth, the "S" is marked only if the tooth is present and all surfaces are sound.

Below this top line there are two rows of numbers. With the exception of the incisors and cuspids which do not have occlusal surfaces, each tooth has five surfaces. These surfaces are:

O	Occlusal	-	top or biting surface,
L	Lingual	-	surface toward the tongue,
B	Buccal	-	surface outside, toward the facial surface,
M	Mesial	-	surface between teeth (side surface toward front of mouth),
D	Distal	-	the side surface of the tooth facing away from the front of the mouth,

The first row of numbers (X), 0, 1, 2, 3 is used to record decay on one of the tooth surfaces. The second row of numbers (5), 6, 7, 8, 9 is used to record filled surfaces of a tooth.

For caries:

X	=	Occlusal
0	=	Lingual
1	=	Buccal
2	=	Mesial
3	=	Distal

For filled teeth:

5 = Occlusal
6 = Lingual
7 = Buccal
8 = Mesial
9 = Distal

If the tooth is permanent with decay on one or more surfaces, the examiner calls the number(s) which, on the data form, correspond(s) to the surface(s) having decay. For example, if the examiner calls X, 0, 1, 2 or 3, it means that there is decay on the surfaces of the tooth represented by those numbers. The recorder fills the appropriate spaces on the caries area of page 1. If the examiner calls 5, 6, 7, 8, or 9, it means that there is a filling on the surface(s) represented by the number(s) called. This procedure continues to the second molar for each of the four quadrants of the mouth.

NOTE: In the event of multiple calls for a tooth surface, the order of precedence is decay and then filled. Only one entry is to be made for each tooth surface. If the examiner gives two codes which are on the same surface, the recorder should bring this to the dentist's attention immediately.

Sealants. Immediately after the examiner calls a tooth for caries status, s/he calls "A" if a sealant is present on either a permanent or primary tooth. This call is after the other tooth or surface calls. Sealants can accompany calls for restorations or caries. The code for sealants, the letter "A", appears at the middle of the tooth box.

Root Caries Recording Procedures. The exam for root caries is conducted in the same order as the coronal assessment, beginning with the central incisor in the upper left quadrant and ending with the 2nd molar in the upper left quadrant. The recorder marks in the appropriate circles in the root caries area on page 1.

The shaded area for recording root caries is structured in the same way as the coronal assessment. The codes "R," "Y," and "M" appear at the top of the shaded area and are codes for the overall condition of the roots:

R = Roots for the entire tooth are sound

Y = Exclusion (root cannot be scored)

M = Not present

If "R" or "Y" is marked, no other mark in the root index can be made.

In some situations, "E", "M" (missing tooth), or "U" (unerupted tooth) will have been previously marked for the tooth during the coronal exam. During the root exam, the examiner will call "M" for all missing teeth and the recorder should make sure that the "E", "M", or "U" was previously marked in the coronal examination. If the examiner called "E", "M", or "U" during the coronal assessment and "R" or "Y" during the root exam, bring this discrepancy to his/her attention immediately.

Also in the root caries assessment are three rows of codes for recording root calls. The first row is for recording decay:

0 = Lingual
1 = Buccal
2 = Mesial
3 = Distal

The second row of numbers is for recording restored or filled portions of the roots:

6 = Lingual
7 = Buccal
8 = Mesial
9 = Distal

Nursing Bottle Caries Recording Procedures. A visual examination of maxillary anterior teeth will determine the presence or absence of decayed or filled teeth in one to two year old children. A single call of 0, 1, or Y will be recorded for each child in this age group.

0	=	No visible evidence of caries or restoration on maxillary anteriors
1	=	At least one maxillary anterior showed evidence of caries or restoration
Y	=	Subject could not be examined.

This assessment is recorded on page 1 of the dental examination form in the upper left section of the page.

5.7 Assessment of the Presence of Third Molars

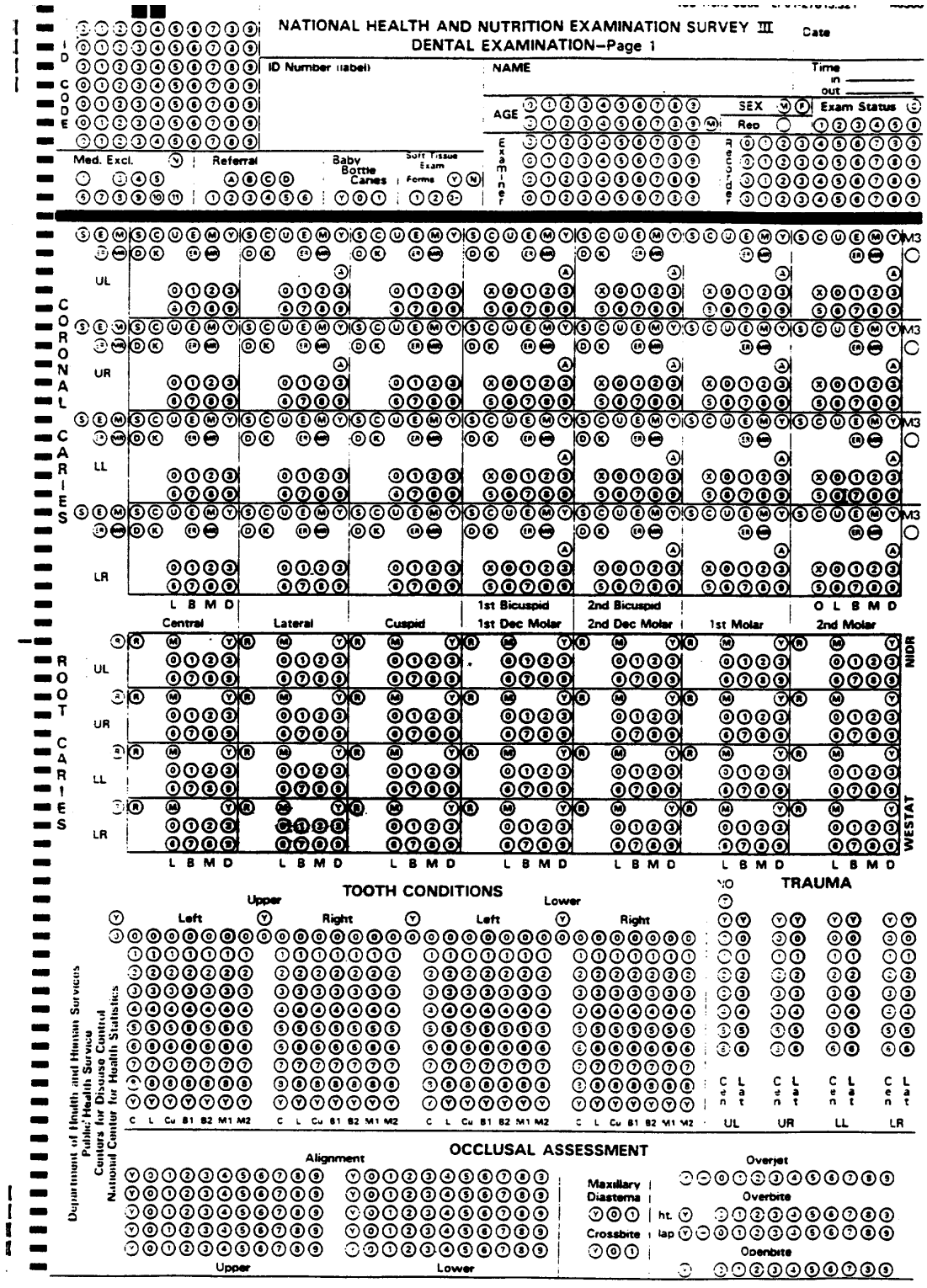
5.7.1 Examination Procedure

SP's 18 years and older will be examined for the presence of third molars at the end of each quadrant of the coronal caries exam. A third molar is assessed to be present when any part of the tooth crown is visible. It is important to note that drifted third molars may occupy the space of a missing second molar. This is only a visual examination and it is not necessary to query the SP.

5.7.2 Recording Procedure

The M3 on the right margin of the caries area of page 1 on the recording form (Exhibit 5-12) is filled in when the examiner calls the presence of the third molar.

Exhibit 5-12


NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION–Page 1
Date
ID Number (label)
NAME
Time in
Time out
AGE
SEX
Rec
Exam Status
Examiner
Recorder
Med. Excl.
Referral
Baby Bottle Caries
Soft Tissue Exam Forms
CORONAL CARIES
ROOT CARIES
UL
UR
LL
LR
L B M D
Central
Lateral
Cuspid
1st Bicuspid
1st Dec Molar
2nd Bicuspid
2nd Dec Molar
1st Molar
2nd Molar
O L B M D
NIDR
WESTAT
TOOTH CONDITIONS
Upper
Lower
Left
Right
C L Cu B1 B2 M1 M2
TRAUMA
NO
UL
UR
LL
LR
OCCLUSAL ASSESSMENT
Alignment
Upper
Lower
Maxillary Diastema
Crossbite
Overjet
Overbite
ht.
lap
Openbite
Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics

5.8 Traumatic Injuries Assessment

5.8.1 Introduction

The objectives of the traumatic injuries component of the survey are to:

- Determine the prevalence of traumatic injuries to permanent incisor teeth in a national sample of children and adults;
- Provide a basis for comparing with future surveys;
- Provide a basis for development of estimates of treatment needs; and
- Provide a basis for developing strategies for the prevention of traumatic injuries to teeth.

References

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Basrani, E.: **Fractures of the Teeth**, Philadelphia, Lea & Febiger, 1985.

Ferguson, F.S., and Ripa, L.W.: Prevalence and type of traumatic injuries in the anterior teeth of preschool children. **J. Pedodont** 4(1): 3-8, Fall, 1979.

5.8.2 Traumatic Injuries Examination Procedures

The clinical assessment is conducted as follows: First ask the SP the following question: "Have you ever had an injury to your front teeth?" This is for your information only. Regardless of the answer, proceed to examine the SP.

The four upper and four lower **permanent** incisors should be carefully examined for evidence of traumatic injury. The teeth should be examined in the same sequence as for the dental caries examination. A positive history of trauma is required for codes 1 through 6. One of the following scores is to be assigned for each incisor tooth:

0. A score of 0 indicates that a tooth has no evidence of traumatic injury.

1. A score of 1 indicates that an unrestored enamel fracture is present that does not involve the dentine.

2. A score of 2 indicates an unrestored fracture which involves the dentine.

3. A score of 3 indicates untreated damage as evidenced by one of the following: (a) dark discoloration, as compared to other teeth -- a discoloration of one tooth or adjacent teeth, which are otherwise healthy is considered a sign of injury or (b) presence of a swelling and/or fistula in the labial or lingual vestibule adjacent to an otherwise healthy tooth.

4. A score of 4 indicates that a fracture has been restored, either with a full crown or a less extensive restoration. It may be necessary to question the subject to determine the reason for the restoration.

5. A score of 5 indicates the presence of a lingual restoration as a sign of endodontic therapy, and a positive history from the subject of root-canal treatment following traumatic injury.

6. A score of 6 indicates a tooth that is missing due to trauma.

Y. A score of Y is to be assigned to any tooth or space that does not fall within the preceding categories; for example; a missing tooth due to reasons other than trauma, or a full crown restoration of a carious tooth.

If there is no clinical presence of trauma for all teeth, then a "No Trauma" call can be made to summarize with one call.

SLIDES ILLUSTRATING TRAUMATIC INJURIES ASSESSMENT

1. This slide shows chipping of enamel at the incisal edges of both the upper central and lateral incisors. A score of 1 is indicated here for each tooth.

2. This slide shows fractures of both upper central incisors. One tooth has a more extensive fracture of the incisal edge which involves the dentine. This tooth should be assigned a score of 2. The other tooth has a slight chipping of only the enamel at the incisal edge and should be scored as 1.

3. This slide shows an upper central and a lateral incisor with fractures. The fracture of the central incisor involves both the enamel and dentine and a score of 2 is appropriate for this tooth. The lateral incisor, however, has a fracture of the enamel at the incisal edge which does not extend into the dentine and a score of 1 is indicated for this tooth.

4. The upper central incisor in this slide has a fracture involving both the enamel and dentine and a score of 2 is indicated here.

5. This slide shows recent fractures of both upper central incisors. One tooth has an extensive fracture of the incisal third of the crown. Examination showed untreated involvement. This tooth should be scored as 3. The incisal edge of the other tooth has a fracture which extends into the dentine and this tooth should be scored as 2.

6. This slide shows a recent fracture of both upper central incisors. Both the fractures extend into the dentine and a score of 2 is appropriate for each tooth.

7. A central incisor in this slide has what appears to be a fracture at the incisal edge involving the enamel only. A careful history, however, elicited the information that the patient had a habit of holding bobby pins between the teeth. As there is no other evidence of accidental injury this tooth is to be assigned a score of 0.

8. This slide shows an incisal edge restoration in a central incisor. It is necessary to obtain a positive history of trauma and fracture of the tooth if we are to assign a score of 4 for this tooth. If there is no history of trauma and the restoration was done because of caries a score of 0 is assigned. It should be noted, however, that some restorations with composite resins are hard to detect. One way to detect these would be to pass the point of the explorer over the crown of the suspected teeth. The tip of the explorer would not glide as smoothly as over enamel.

9. The item of interest on this slide is the full crown on the upper central incisor. Please ignore the probe! This tooth is to be scored a 4 only if there is a positive history of trauma to the tooth. If the restoration was placed because of caries with no history of trauma the tooth should be scored as 0.

10. This slide shows a missing central incisor replaced by a removable partial denture. If there is a positive history of trauma and subsequent extraction of that tooth a score of 6 is to be assigned. If the extraction was due to reasons other than trauma a score of Y should be assigned.

11. This slide shows recent fractures of several teeth. An upper central incisor has a fracture which extends into the dentine and was found to involve the pulp. A score of 3 is indicated for this tooth. The other upper central incisor has a chipping of the incisal edge that does not extend beyond the enamel and a score of 1 is appropriate. A lower central incisor also has a fracture which, however, extends into the dentine and a score of 2 is indicated for this tooth.

12. This slide shows a fractured primary upper central incisor with a chronic periapical abscess. There is a positive history of trauma to the tooth and if this tooth were a permanent incisor it would be assigned a score of 3. For the purpose of the present survey, however, primary teeth are excluded and hence this tooth would be scored as a Y.

13. This slide shows a primary upper central incisor which is discolored. There is a history of trauma and if this were a permanent tooth it would receive a score of 3. As mentioned earlier, traumatized primary teeth are excluded from this survey and hence this tooth should be scored as a Y.

14. This slide shows a lower incisor with a lingual pit filling indicating endodontic therapy. If the patient gives a positive history of trauma which occurred prior to the endodontic therapy the tooth is to be assigned a score of 5; otherwise assign a score of 0.

15. This slide shows heavily abraded upper anterior teeth with what appear to be vertical fracture lines on the upper central incisors and a cuspid. There is no history of trauma to these teeth. Therefore each of these teeth are to be scored as 0.

TRAUMA

SLIDES

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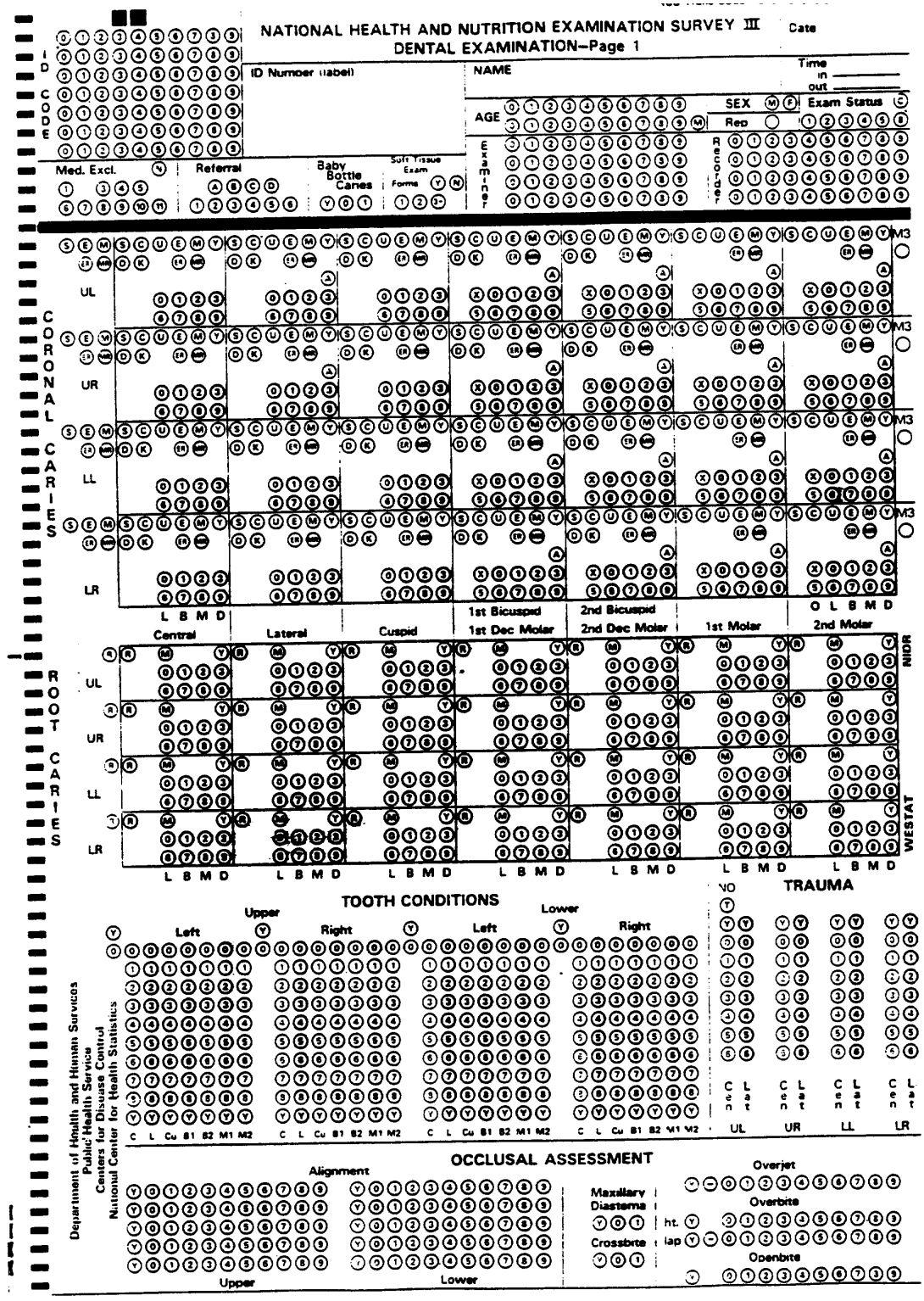
5.8.3 Traumatic Injuries Data Recording Procedures

Space is provided for recording traumatic injuries on the lower right hand area of page 1 (Exhibit 5-13) of the dental examination form. If there is no physical indication trauma in any of the eight incisors, the examiner will call "No T," and the recorder should fill in the "T" circle in the upper section of the trauma area.

Exhibit 5-13


NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION–Page 1
ID Number (label)
NAME
AGE
SEX
Exam Status
Med. Excl.
Referral
Baby Bottle Caries
Soft Tissue Exam
CORONAL CARIES
ROOT CARIES
UL
UR
LL
LR
L B M D
Central
Lateral
Cuspid
1st Bicuspid
1st Dec Molar
2nd Bicuspid
2nd Dec Molar
1st Molar
2nd Molar
O L B M D
NIDR
WESTAT
TOOTH CONDITIONS
Upper
Lower
Left
Right
TRAUMA
OCCLUSAL ASSESSMENT
Alignment
Maxillary
Diastema
Crossbite
Overjet
Overbite
Openbite
Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics

5.9 Occlusal Characteristics Assessment

5.9.1 Introduction

The objectives of the occlusal and dentofacial characteristics component of the survey are to:

- Determine the prevalence of selected occlusal and dentofacial characteristics in a national sample;
- Provide a basis for comparing with future surveys;
- Provide baseline data for possible follow-up of selected sub-samples; and
- Provide a basis for future development of estimates of treatment needs.

The occlusal characteristics are similar to those used in the previous HANES surveys of 1963-65, and 1967-69, and based on the Grainger's Treatment Priority Index (TPI). In the TPI method, six occlusal characteristics are scored separately, and a weighted regression formula is used to calculate a single summary number that is supposed to represent treatment need. Subsequent experience with these data has shown that the disaggregated information of components of occlusion like overjet and overbite are quite useful. While there is no summary TPI number to compare with the previous HANES surveys, it is possible to compare several of the occlusal characteristics, for which data collection methods are similar, if not identical.

References

Ackerman, J.L., and Proffit, W.R.: The characteristics of malocclusion: A modern approach to classification and diagnosis. **Am. J. Orthod**. 56(5): 443-54, Nov. 1969.

Fields, H.W. and Vann, W.F.: Prediction and skeletal relationships from facial profiles in preschool children. **Pediatric Dent**. 1: 7-15, 1979.

Fields, H.W., Vann, W.F., and Vig, K.W.L.: Reliability of soft tissue profile analysis in children. **Angle Orthod**. 52: 159-65, 1982.

Fields, H.W., Proffit, W.R., Nixon, W.L., Phillips, C., and Stanek, E.: Facial pattern differences in long-face children and adults. **Am. J. Orthod**. 85: 217-33, 1984.

Little, R.M.: The irregularity Index: A quantitative score of mandibular alignment. **Am. J. Orthod**. 68: 554-:63, 1975.

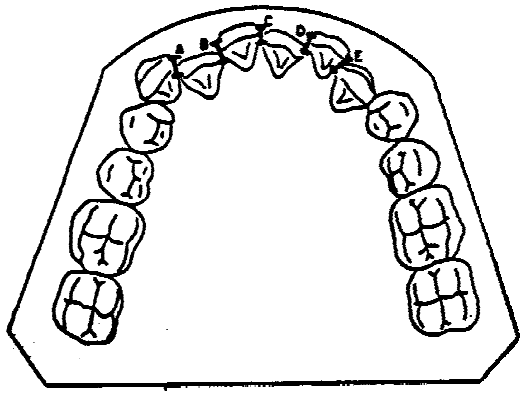
5.9.2 Diagnostic Procedures

The Examination: This examination is carried out by scoring five characteristics: incisor irregularity, posterior crossbite, overjet, overbite/openbite, and maxillary diastema.

1. **Incisor Alignment**:

Criteria**.** The scoring method involves measuring the linear displacement of anatomic contact points (as distinguished from the clinical contact points) of each maxillary and mandibular incisor from the adjacent tooth anatomic contact point. The sum of these five displacements represents the degree of irregularity in the alignment of incisors in each jaw. Perfect alignment from the mesial aspect of the left canine to the mesial aspect of the right canine would theoretically have a score of zero, with increased crowding represented by greater displacement and, therefore, a higher index score.

Procedure**.** Start at the mesial of the maxillary right canine and evaluate each contact around to the mesial of the left canine, then evaluate each contact of the mandibular arch starting at the mesial of the mandibular left canine and continuing to the mesial of the right canine. The millimeter distance from the contact point of each tooth to that of its neighbor is scored, using the NIDR periodontal probe which is held perpendicular to the curve of the arch (Figure 1). The numbers should be rounded down to the nearest whole millimeter. Contacts are scored only if both teeth have erupted to the level of the occlusal plane. A call of Y is made for contacts that cannot be scored, for example, missing teeth, unerupted or partially erupted teeth and fractured teeth.



A+B+C+D+E = irregularity index

Figure 1

Note: In calculating the irregularity score, mesiodistal separation of contact points, as when a space (diastema) exists between teeth, is ignored. For example, if the central incisors are separated by 2 mm, but are aligned so that there is no labiolingual discrepancy between the contact points, the score is zero. If they are separated by 2 mm but the contact points also are labiolingually displaced by 2 mm the score is 2.

2. **Maxillary Midline Diastema**:

Criteria**.** A space between the maxillary central incisors of greater than 2 mm width is scored as the presence of midline diastema.

Procedure**.** The call for maxillary midline diastema is "1" if the width, measured at the incisal edge, exceeds 2 mm. Otherwise the call is for zero midline diastema. If any one of the incisors is missing, has a full crown, or has a fractured mesial incisal edge, then a Y call is made.

3. **Presence or Absence of Crossbite**

Criteria. For determining this only the posterior primary or permanent teeth, defined as those distal to the canine are scored, if they have erupted into occlusal contact. Single tooth crossbites are ignored -- the criterion for presence of crossbite is that at least two teeth are involved, i.e., either one tooth on each side or two teeth on one side. Only if the teeth are displaced facially or lingually past cusp to cusp, crossbite is scored (Figure 2). If any permanent tooth is showing, then, its predecessor, even if in crossbite, is ignored.

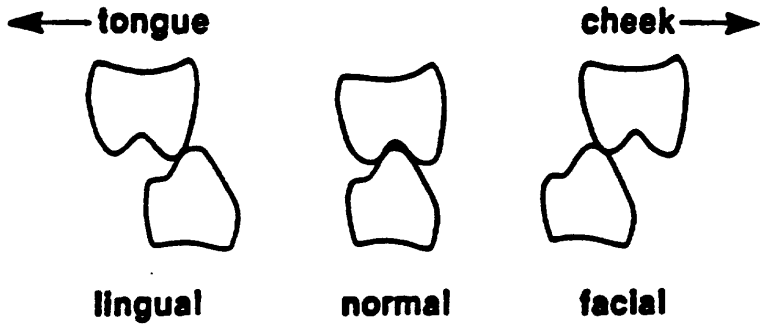


Figure 2

Procedure. Have the subject close together his/her posterior teeth normally and look for the presence or absence of crossbite as determined by the foregoing criteria, and give the appropriate call. A "Y" call is made if any two of the posterior teeth are missing or if one tooth is in crossbite and one is missing.

4. **Overjet**:

Criteria. Overjet is defined as the horizontal overlap of the incisor teeth. It is measured to the lowest whole millimeter using the periodontal probe, from the mid point of the labial surface of the **most anterior** lower central incisor to the mid point of the labial surface of the **most anterior** upper central incisor, **parallel** to the occlusal plane (Figure 3). The overjet is positive if the upper incisor is ahead of the lower incisor, zero if the upper and lower incisors are immediately on top of each other, and negative if the lower incisor is in front of the upper incisor. If any one of the four central incisors is missing, fractured, or not fully erupted, then overjet should not be measured, and a "Y" call is made.

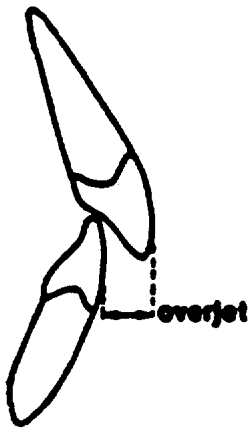


Figure 3

Procedure. Have the subject close together his posterior teeth normally and measure the overjet, up to the labial edge of the outer tooth, rounded to the lowest full millimeter, using the periodontal probe. If the upper central incisor is ahead of the lower, call out the number as a positive one. If the incisors are on top of each other (edge to edge) call out a zero score and if the lower incisor is anterior to the upper incisor call out a negative score. If the central incisors are not in similar anterior position, take an average judgment. A Y call is made if the overjet cannot be measured due to missing, fractured, or unerupted teeth.

5. Overbite and Openbite

Criteria:. Clinically and quantitatively overbite is defined as the vertical overlap of the incisor teeth when the posterior teeth are in contact. Overbite is positive if the incisors overlap vertically, zero if they are edge to edge, and negative if they are vertically separated, i.e., negative overbite = openbite. (See Figure 4).

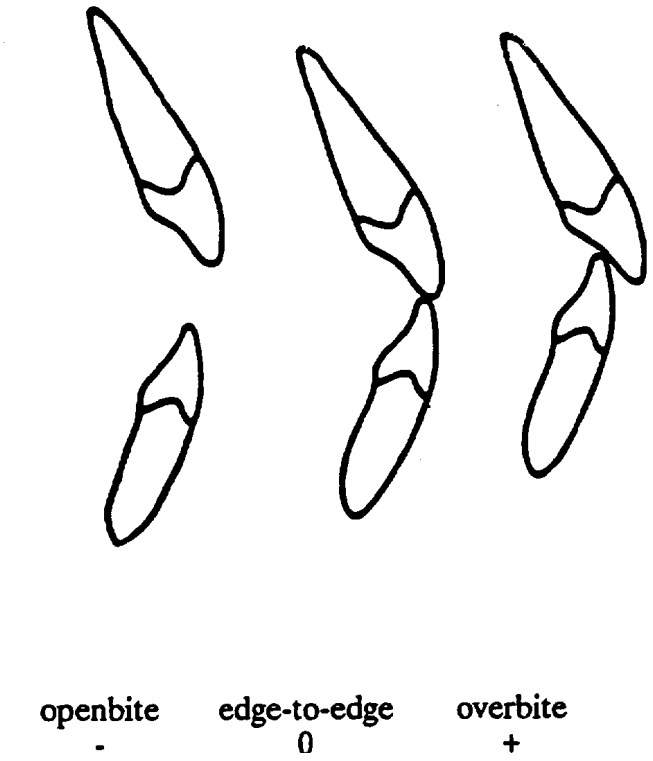
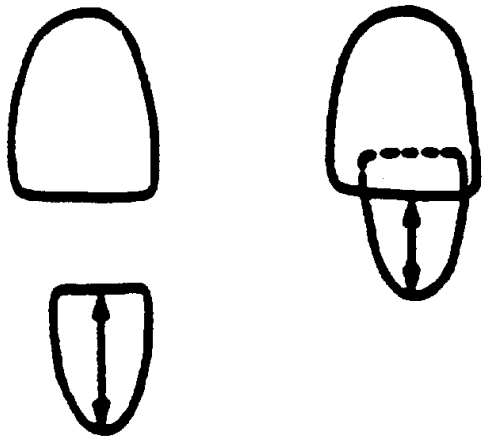


Figure 4

Procedure. The assessment of overbite is made on the upper right central incisor using the NIDR periodontal probe. If a measurement is "9" or greater, the call should be "A", "B", OR "C" (A=10, B=11, C=12). If one or both the right central incisors (upper or lower) are not fully erupted, missing, or fractured, substitute the left permanent central incisors. If even the left central incisors cannot be scored, no further substitution is possible, and a Y call is made. If, however, the teeth are rotated take the measurement from the center of the teeth. Measurements are to be rounded down to the nearest whole millimeter.

The following paragraphs describe ways of recording three different kinds of overbite/overjet conditions that may exist in each subject's mouth. Only one of the three conditions will prevail in any one subject.

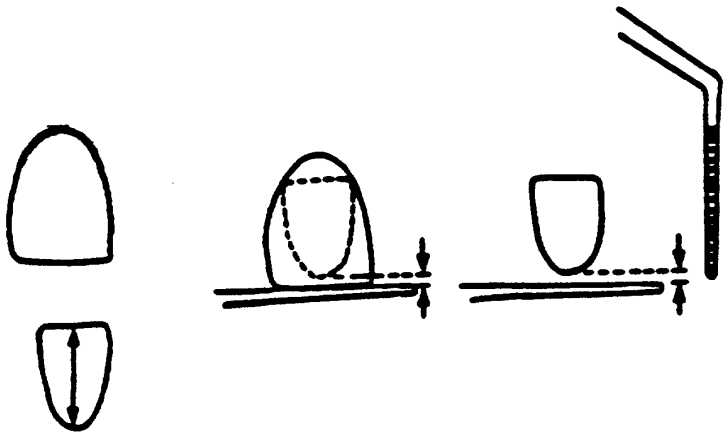
A). Positive Overbite. When a positive overbite exists, two measurements are made and their difference is overbite. First, with the teeth separated, the distance from the gingival margin of the lower incisor to its incisal edge is measured and the call **crown height = __ mm** is made. If the CEJ is exposed, measure from the incisal edge to the CEJ. Second, with the subject's teeth together, measure from the same point on the gingival margin or the CEJ as before to the incisal edge of the upper central incisor and call this **overlap = __ mm** (Figure 5). The difference between these measurements (a-b) is overbite and will be evaluated by the computer.



a b

Figure 5

B). Negative Overbite. If the overbite is so great that the upper incisor closes beyond the gingival margin of the lower incisor and it is totally covered with the posterior teeth together, two measurements are made. The first is the crown height of the lower incisor measured as above. The second measurement -- overlap -- is done as follows: With the teeth together, measure the amount of overlap of the gingival margin, or the CEJ as appropriate, by the upper incisor. The distance is obtained by laying the handle of the mouth mirror horizontally at the level of the incisal edge of the upper incisor and measuring the distance from the handle to the gingival margin of the lower incisor rounded down to the lower millimeter (Figure 6). The overbite will be the total of the first measurement (crown height) and the second one (overlap), and will again be calculated by the computer (a- (-b). Call this **overlap = negative __ mm**.



a b

Figure 6

C). Open Bite. If open bite is present, a single measurement is made. With the posterior teeth in occlusion, measure the vertical distance in millimeters from the edge of the lower central incisor to the edge of the upper central incisor (Figure 7) and call **open bite = __ mm**.

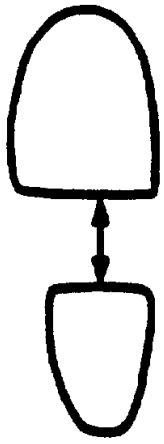


Figure 7

SLIDES ILLUSTRATING OCCLUSAL VARIABLES

1. Incisor irregularity is measured as a sum of the displacement of the five contacts between the anterior teeth. Details of these measurements are given in the manual.

2. This demonstrates that a low incisor irregularity score generally is found with reasonably good alignment. This case demonstrates 1.8 mm irregularity.

3. This demonstrates a higher incisor irregularity score and worse alignment. This case shows 3.8 mm irregularity.

4. An irregularity score of 8.7 mm demonstrates poor alignment.

5. Several periodontal probes can be used to make these measurements. Usually periodontal probes that have colored segments make it easier to make successful judgments.

6. The periodontal probe on the left is preferred because it has evenly marked increments throughout the range of usual measurements made in the occlusal variable analysis.

7. This slide demonstrates the intraoral technique used to measure contact displacement.

8. This also demonstrates the clinical technique for measurement from the middle of the contact point to the middle of the adjacent contact point.

9. This slide demonstrates a midline diastema that would be classified as present (greater than 2 mm) when measured at the incisal edge.

10. This slide demonstrates the distinctions for posterior crossbite. It should be noted that posterior crossbites are considered as being present if there are deviations past cusp-to-cusp as is demonstrated for both the lingual and facial displacement.

11. The easiest way to determine if a posterior crossbite is present is to have the patient bite in centric occlusion and retract the cheek first on one side ...

12. and then while the patient is still biting, retract the cheek and view the other side of the dentition.

13. In this situation, it is apparent that none of the posterior teeth are in crossbite. The cusp-to-cusp relationship with the primary canine would be ignored because it is not a posterior tooth.

14. In this situation, crossbite would be counted as present because more than one posterior tooth is in crossbite on one side of the arch. Again, the canines would be ignored.

15. In this situation, posterior crossbite would be counted as present because multiple posterior teeth are in crossbite.

16. In this situation, posterior crossbite would not be scored because only anterior teeth are in crossbite.

17. Overjet is measured as the horizontal distance from the most anterior central incisor in the lower arch to the most anterior central incisor in the upper arch. This measurement is obtained by using the periodontal probe.

18. This is a demonstration of the periodontal probe being used intraorally to measure overjet.

19. This subject would have a negative overjet due to the anterior crossbite.

20. Even though several teeth are in anterior crossbite, the measurements would be made using the central incisors and the overjet would be considered positive.

21. Overbite is measured as the vertical overlap of the teeth but due to several clinical circumstances, this must be measured in a specially prescribed manner.

22. Overbite is negative if there is no overbite and, in fact, there is open bite. Overbite is zero if the incisors are edge to edge, and overbite is positive if the incisors overlap.

23. In the case of open bite with the posterior teeth in occlusion, the distance is measured from the upper to lower right central incisal edge using the periodontal probe.

24. This is a demonstration of a patient with a clinical open bite in which the measurement would be made as previously described.

25. In this clinical simulation, the overbite (open bite) would be measured as shown.

26. If there is overlap of the anterior teeth, the first measurement is that of the lower incisal crown height from the gingival margin to the incisal edge. This distance is called and recorded. Measurement (b), which is made when the posterior teeth are in contact, is from the gingival margin to the incisal edge of the maxillary incisor. This value is entered as exposed lower incisor crown height.

27. This would be a situation in which the patient would have vertical overlap of the teeth and measurements made in the manner previously demonstrated.

28. This simulation of a patient demonstrates that the clinical crown height is measured (a).

29. The exposed clinical crown height then is measured (with the patient in centric occlusion). In this patient, there is limited vertical overlap.

30. In some cases, there will be complete overlap of the lower incisor by the upper incisor. Therefore, the technique needs to be modified. In these situations, the first measurement (a) is again the lower incisor crown height. The next step is to have the patient bite in centric occlusion and place the handle of the mouth mirror at the level of the upper incisal edge. When the patient opens, measurement (b) is estimated from the level of the mirror handle to the gingival margin and this measurement is recorded as gingival overlap.

31. This slide demonstrates a patient in which the previous procedure must be used to determine the amount of vertical overlap.

32. In these situations, the lower crown height would be measured,

33. And if this patient had complete overlap, the overlap would be marked by laying the probe horizontally and then an estimation made of the distance from the probe to the lower incisal gingival margin.

OCCLUSAL

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5.9.3 Occlusal Recording Procedures

Occlusal characteristics are recorded on page 1 of the Dental Examination Form (Exhibit 5-14), below the Tooth Condition and Traumatic Injuries area. For alignment, the examiner will call 5 measurements for the upper jaw and 5 measurements for the lower jaw. These will range from zero to 9, or a "Y" (if a score cannot be made). For maxillary midline diastema, the calls are zero, "1," or "Y." For posterior crossbite, the calls are zero, "1," or "Y." For overjet, the measurements range from zero to 9+ or "Y." If this measurement is negative, the minus sign needs to be marked. Each SP will have either an overbite or openbite measurement, but not both. For an overbite, two measurements are made: height (zero to 9, "A", "B", "C" or "Y"), and overlap (zero to 9, "A", "B", "C" or "Y"), which could be a negative number (needing a minus sign). An openbite requires only one measurement (zero to 9, "A", "B", "C" or "Y").

5.10 Periodontal Disease Assessment

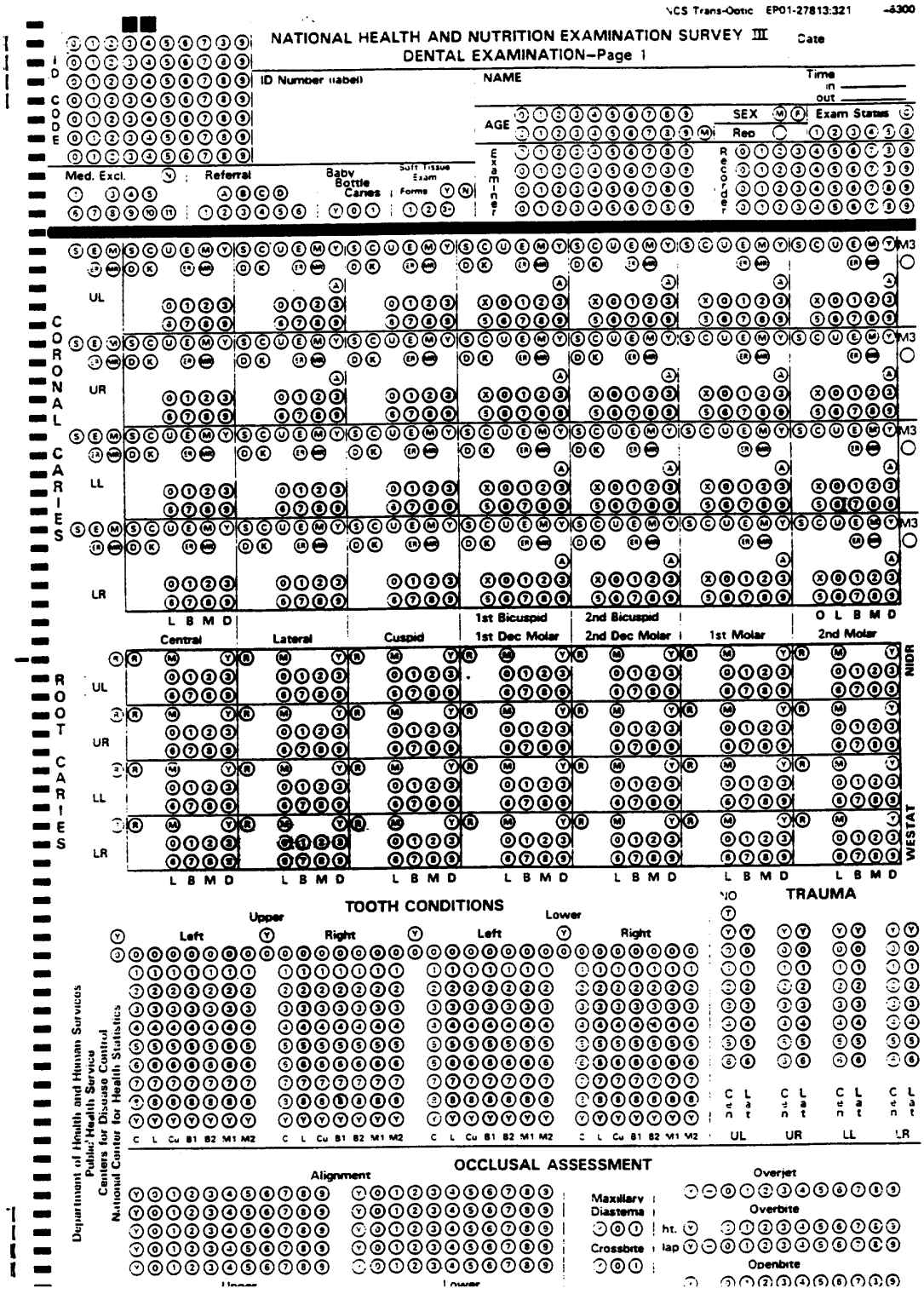
5.10.1 Introduction

The objectives of the periodontal diseases component of the survey are to:

- Establish age-specific data for the prevalence of periodontal diseases in a national sample;
- Provide a basis for comparisons with past and future national periodontal diseases surveys;
- Provide baseline data for possible followup of selected subsamples;
- Provide a basis for the future development of estimates of treatment needs; and
- Provide a basis for studying the association between periodontal diseases prevalence and risk factors.

This section includes three parts: periodontal destruction assessment (including furcation involvement), gingival assessment, and the calculus assessment.

Exhibit 5-14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NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION–Page 1
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Exam Status
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Examiner
Recorder
Med. Excl.
Referral
Baby Bottle Caries
Soft Tissue Exam Forms
CORONAL CARIES
UL
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LL
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L B M D
1st Bicuspid
2nd Bicuspid
1st Dec Molar
2nd Dec Molar
O L B M D
Central
Lateral
Cuspid
1st Molar
2nd Molar
ROOT CARIES
NIDR
WESTAT
TOOTH CONDITIONS
Upper
Lower
Left
Right
C L Cu B1 B2 M1 M2
NO TRAUMA
OCCLUSAL ASSESSMENT
Alignment
Maxillary
Diastema
Crossbite
Overjet
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ht.
lap
Openbite
Department of Health and Human Services
Public Health Service
Centers for Disease Control
National Center for Health Statistics

The diagnostic criteria used for this section have been developed utilizing the following references as a basis:

Löe, H. and Silness, J.: Periodontal disease in pregnancy. I. Prevalence and severity. **Acta Odont**. **Scand**., 21:533, 1963.

Ramfjord, S.P.: Periodontal disease index (PDI). **J Periodont**., 38:585, 1967.

Ramfjord, S.P. and Ash, M.N.: **Periodontology and Periodontics**. W.B. Saunders Co. Philadelphia, 1979.

Glickman, J.: Bifurcation involvement in periodontal disease. **J. Am. Dent. Assn**., 40:528, 1950.

With minor modifications, these diagnostic criteria have been used in the NIDR National Survey of Oral Health in U.S. Employed Adults and Seniors (1985-86) and the NIDR National Survey of Oral Health in School Children (1986-87) and in several state-wide surveys.

The examination of the two randomly selected quadrants will follow the sequence on the data forms. The examiner will examine the maxillary quadrant first, then proceed to the mandibular quadrant, beginning with the second molar and moving forward through each quadrant. The sequence of the examination includes the gingival assessment, calculus assessment, periodontal destruction assessment, and the furcation assessment. Only permanent teeth in full eruption will be scored for periodontal assessments.

5.10.2 Selecting Random Quadrants for Periodontal Assessment

The computer program will identify the random quadrants selected for the periodontal assessment, which is performed on SP's 13 years of age and older. If the computer fails to function properly, the dental examiner will select one random upper quadrant and one random lower quadrant for the periodontal assessment. In order to do this, s/he will use the 5th and 6th digits of the SP's ID number, as follows:

The fifth digit of the ID number will be used to select the upper quadrant. If this number is even, the right side will be used. If this number is odd, the left side will be used.

Similarly, the sixth digit of the SP's ID number will be used to select the lower quadrant for the periodontal examination. If this number is even, the right side will be used. If this number is odd, the left side will be used.

The quadrant selected will then be indicated in the upper left-hand corner of the periodontal examination form.

For example, if the SP's ID number is 123456-7, this would represent a left upper and right lower designation for the SP.

1	2	3	4	5	6	7
			left upper			right lower

The correct quadrant should then be recorded on the upper right section of page 2 of the Dental Examination Form and under 'Comments' on the Daily Log Form.

5.10.3 Gingival Assessment

The following approach will be applied to two surfaces of each tooth. Buccal and mesiobuccal sites of two quadrants will be assessed. A score of 0 or 1 will be assigned for each permanent tooth site:

0 = No bleeding,
1 = Bleeding, and
Y = Cannot be assessed.

The teeth should be dried with air from the buccal aspect before beginning each quadrant. To examine the gingiva adjacent to each tooth the NIDR probe will be inserted no more than 2 mm into the gingival sulcus, starting just distal to the midpoint of the buccal surface and then moved gently into the mesial interproximal area. After all sites from the facial or buccal aspect of a single quadrant are examined in this fashion, the bleeding points are scored. A call of 0 or 1 is made for each buccal and mesial site beginning with the second molar and continuing to the central incisor.

If the tooth is missing or cannot be assessed, a single "Y" call is made. Partially erupted teeth or deciduous teeth will also be coded as "Y". If the entire quadrant cannot be scored the single code of "NS" (no score) will be called.

SLIDES ILLUSTRATING GINGIVAL ASSESSMENT

1. Instruments for the Gingival Assessment

   The NIDR probe will be the primary instrument used for the gingival assessment. The probe will be placed in the gingival sulcus at the midpoint of the buccal surface for all posterior and anterior teeth at a depth not to exceed 2mm (the beginning of the first yellow band on the NIDR probe).

2. Drying of Quadrant

   Buccal aspects of each quadrant should be carefully dried prior to the beginning of the gingival assessment prior to the beginning of each aspect.

3. Sequence of Examination

   For the gingival assessment, the examiner will begin with the most posterior tooth excluding the third molar. Buccal and mesial surfaces in a quadrant will be scored.

4. Placement of the Probe in the Buccal Site

   In this slide the probe is placed at the midpoint of the buccal surface. In this mouth it was possible to place the probe almost 2mm into the sulcus. In some subjects only the tip of the probe will be inserted into the sulcus.

5. Movement of Probe into Mesial Site

   After the probe is placed in the sulcus at the buccal site, the probe is carefully swept into the mesial interproximal area. During this procedure the probe is gently placed against the tissue rather than against the tooth surface.

6. Scoring the Bleeding Points

   When all teeth in the quadrant from a buccal or facial approach have been examined, the examiner will observe the buccal and mesial sites of each tooth and make the appropriate call. Using the central incisor again for a point of reference, the examiner would call two zeros (0,0) since no bleeding is evident at the buccal or mesial sites.

7-9. Demonstration on Cuspid

   On the next slides, the assessment will be repeated for an anterior tooth, the maxillary cuspid. The probe is placed in the buccal sulcus and moved gently into the mesial interproximal area. After completion of the quadrant the examiner would make two calls for each tooth from the facial aspect -- the first call for the buccal site and the second call for the mesial site. For the cuspid that you see in this slide, the first call would be 0 and the second call 0. For the lateral incisor,

the calls would be 0 and 1. For the central incisor, the bleeding points can be observed at both sites and calls of 1,1 would be made. When bleeding points merge or when the bleeding from the buccal or mesial site extends more than half way, the tooth would be scored as 1,1.

10. Chronic Destruction

    On this slide the subject has chronic periodontal destruction. The examiner should be aware that bleeding points may not always be present with advanced disease.

11. Advanced Destruction (discussion slide)

    On this slide several periodontal conditions can be noted including severe inflammation. Although the examiner may be tempted to use the "no score" code for this dentition, the examiner should proceed in the usual manner and if necessary use the "Y" code for individual teeth that cannot be assessed.

GINGIVA

SLIDES

HERE

5.10.4 Calculus Assessment

As with the gingival assessment, the following criteria will be applied to both the mesiobuccal and buccal aspects of each tooth. A score will be assigned for each tooth site, i.e., mesiobuccal and buccal. Also, only a periodontal probe will be used for this assessment.

A single score will be assigned for each buccal and mesiobuccal surface according to the following codes:

0 = Absence of calculus,

1 = Supragingival calculus but no subgingival calculus present,*

2 = Supragingival and subgingival calculus, or subgingival calculus only, and

Y = Cannot be assessed

The assessment for calculus should be made after the teeth are dried with air. The examiner should dry the buccal aspect of the teeth with air and then observe the buccal and mesiobuccal aspects of each tooth to determine the presence of supragingival calculus and probe for subgingival calculus using the NIDR probe.

If the surface is missing or cannot be assessed, a single "Y" call is made. Partially erupted teeth or deciduous teeth will also be coded as "Y". If the entire quadrant cannot be scored, the single code of "NS" (no score) will be called.

*** Supragingival calculus includes calculus located on the exposed crown and root of the tooth and extends up to 1 mm below the free gingival margin (FGM).**

SLIDES ILLUSTRATING CALCULUS ASSESSMENT

1-2. Drying of Teeth

The assessment for calculus should be made after the quadrant is dried with air. The examiner should observe the buccal and mesial aspects of each tooth beginning with the most posterior tooth excluding third molars. The first slide depicts a quadrant prior to drying, and the second is after the quadrant has been dried.

3. Scoring for Calculus

On this slide supragingival calculus may be observed on the buccal surfaces of the cuspid and the 1st mandibular bicuspid, and subgingival calculus is detected on these same teeth using the NIDR probe. The examiner would make a call of 2 for both of these buccal surfaces.

4. Calculus Assessment Call When Recession Present

Supragingival calculus includes calculus located on the exposed crown and root of the tooth and extends up to 1 mm below the free gingival margin (FGM). On this slide the calculus that can be viewed on the root and coronal portions of the teeth would be scored as a "1" unless subgingival calculus were also detected.

5. On this slide a well maintained dentition can be observed in a subject with advanced destruction. The examiner should not be tempted to call this a "0" for each tooth site in the quadrant until further exploration is performed with the NIDR probe.

CALCULUS

SLIDES

HERE

5.10.5 Periodontal Destruction

The periodontal destruction examination includes both an assessment of loss of attachment and furcation involvement. For loss of attachment, criteria will be applied to two sites per tooth: the buccal and the mesiobuccal sites. For furcation involvement the maxillary 1st and 2nd molars, 1st bicuspids, and mandibular 1st and 2nd molars will be examined. The analysis of these data will permit reporting of loss of attachment, gingival recession, periodontal pocket depth, and furcation involvement. The assessment for periodontal destruction will be made for two quadrants. Only permanent teeth in full eruption are to be measured.

Loss of Attachment. Clinically and quantitatively the loss of attachment is the distance in millimeters (mm) from the cementoenamel junction (CEJ) to bottom of the pocket. Loss of attachment will be calculated by the computer program. The examiner will take two measurements per site for use in this calculation.

The NIDR periodontal probe will be used to measure the buccal (B) and mesiobuccal (M) sites. For each site, first, the distance from the free gingival margin (FGM) to the CEJ, and second, the distance from the FGM to the bottom of the pocket will be measured and called. Where the gingival margin is subject to recession and the CEJ is exposed, the distance from the CEJ to the gingival margin is called a negative value.

The NIDR probe is color coded and graduated at 2, 4, 6, 8, 10, and 12 millimeters. The periodontal probe is to be held with a light grasp not to exceed 25 grams and pointed toward the apex of the tooth. Each measurement is rounded to the lowest whole millimeter. The probe is inserted from the buccal aspect to measure both buccal and mesial sites.

For the interproximal site (M) the examiner should keep the probe parallel to the long axis of the tooth even if the adjacent tooth is missing. For the upper and lower molars the buccal assessments are always made at the midpoint of the mesial root, keeping the probe parallel to the long axis of the tooth.

Furcation Involvement. When probing attachment distance and pocket depth measurements have been completed in the two designated quadrants exploration for furcation involvement will be carried out with a #17 explorer for maxillary 1st and 2nd molars and the 1st bicuspid. The cowhorn explorer (#3) will be used to enter the 1st and 2nd mandibular molars. The extent of furcation involvement recorded for the distal, buccal, and mesial sites for maxillary molars, distal and mesial sites for 1st bicuspids, and buccal and lingual sites for mandibular molars will be classified according to the following criteria:

0 - No involvement

1 - Partial involvement, not passing through the furcation. Specifically, when a #3 or #17 explorer definitely can be placed into the furcation and cannot be moved coronally by pulling in the direction of the long axis of the tooth. The probe cannot be passed through the furcation.

2 - Comprises the through and through involvement in which an explorer probe can be passed between the roots through the entire furcation to indicate a through and through bifurcation and trifurcation involvement.

NOTE: For maxillary molars the examiner should approach the assessment from the distolingual and then the mesiolingual aspects first. Then proceed to buccal sites. After all tooth sites are examined, the scores for the maxillary molars will be called in the order of the distal, buccal, then mesial sites.

Special Considerations for Both Loss of Attachment and Furcation Involvement Assessments:

1. Calculus at mesiobuccal or buccal sites that obscures the CEJ or interferes with the correct placement of the probe is removed using a scaler.

2. When the margin of a restoration is below the CEJ, the position of the CEJ will be estimated using adjacent landmarks and dental anatomy.

3. When the CEJ cannot be estimated, the examiner will code Y to exclude the site.

4. When the natural tooth is missing, (i.e., space maintainers, implants, partial denture, or pontics), the tooth sites are scored Y. (On the recording form, the missing tooth position should be the same for both the periodontal and caries assessments.)

5. Mobile teeth should be examined with care. The CEJ should be estimated if possible.

6. Orthodontically banded teeth, splinted teeth, and hemisected teeth will be considered on an individual basis and should be examined if possible.

7. Partially erupted teeth are excluded from all periodontal assessments. Retained roots are also excluded if the CEJ and part of the clinical crown are not present. The code of Y should be used for mesiobuccal and buccal sites of the excluded tooth. If the entire quadrant cannot be scored, the single code of "NS" (no score) should be called.

SLIDES ILLUSTRATING DIAGNOSTIC CRITERIA
FOR PERIODONTAL DESTRUCTION

1. Loss of Attachment

Measurement with the NIDR probe will be made from a fixed point, the cementoenamel junction (B). The distance from the free gingival margin (A) to the CEJ (B) and the distance from the free gingival margin (A) to the bottom of the gingival crevice or pocket (C) will be measured at the mesial and buccal sites of each tooth examined. The distance from the CEJ to the bottom of the pocket (BC), the distance which represents a loss of attachment, will be determined by subtracting the first measurement (AB) from the second (AC) by a computer program.

2. Gingival Recession

In this diagram of the cuspid the gingival margin is on the cementum (left). The distance from the cementoenamel junction to the gingival margin (a) is called by the examiner as a negative value. The distance from the free gingival margin to the bottom of the sulcus (b) represents pocket depth and is also measured.

3. The Level of Attachment (Discussion slide)

In this slide the level of attachment is demonstrated in normal and diseased sites. The attachment is at the cementoenamel junction in the diagram on the left. The distance from the free gingival margin to the CEJ (Y) is called 2, and the distance from the FGM to bottom of sulcus (X) is also called 2. The loss of attachment (X-Y), or the difference between the two observations, equals 0. The diagram in the middle of the slide depicts the derivation of loss of attachment when the FGM is coronal to the CEJ (8-3=5 mm). In the diagram on the right the FGM is apical to CEJ (6-(-1)=7 mm). In the field the examiners will be making the calls for X and Y only. The loss of attachment (Z) will be calculated by computer program.

For the purposes of this survey, Y represents the attachment distance (FGM/CEJ), and X represents the probing depth (FGM/pocket).

4-5. NIDR Periodontal Probe

The NIDR periodontal probe is color coded with a point diameter of .38 mm. The thickness of the periodontal probes has been standardized. The probe is graduated at 2, 4, 6, 8, 10 and 12 millimeters. The yellow bands represent 2 mm increments. The examiner will round each measurement to the lowest whole millimeter.

6. Probe Grasp

The periodontal probe is to be held with a light grasp not to exceed 25 grams and pointed toward the apex of the tooth. The supervising dentist should be able to remove the probe from the examiner's hand without resistance.

7. Location of the Cementoenamel Junction

   The first goal in the periodontal destruction assessment is to determine the location of cementoenamel junction (CEJ). In this slide the probe is being used to search for the CEJ. When the FGM is at the CEJ, the examiner would call zero (0) for the FGM/CEJ call.

8. Probe Position--Buccal Surface

   The tip of the probe is placed in contact with the buccal surface of the central incisor. The buccal probing depth = 1 mm. (Note color on probe.)

9. Probe Position--Mesial Surface

   This slide illustrates the correct probe position for the mesial surface of the central incisor when an adjacent tooth is present. The probing depth = 2 mm. (Note color on probe.)

10. Probe Position--Diastema

    In this slide there is a diastema between the central incisors. The examiner would place the probe tip in contact with the mesial surface of the central incisor, parallel to this long axis of the tooth, and as close to the estimated contact point as possible. The probing depth = 3 mm. (Note color on probe.)

11. Probe Position--Maxillary Molar

    In this slide the probe is positioned parallel to the long axis of tooth on the mesial surface of a 1st maxillary molar. The probe is placed close to the contact area between the distal surface of the 2nd bicuspid and the mesial surface of the 1st maxillary molar. The probing depth = 2 mm. (Note color on probe.)

12. Probe Position--Adjacent Tooth Missing

    The 1st bicuspid is missing in this quadrant. The probe is inserted on the mesial surface of the 2nd bicuspid as close to the contact area as possible. The probing depth = 3 mm. (Note color on probe.)

13. Buccal Assessment--Maxillary Molars

    The buccal measurements for maxillary molars will be made at the midpoint of the mesiobuccal root.

SLIDES ILLUSTRATING DIAGNOSTIC CRITERIA
FOR PERIODONTAL DESTRUCTION (continued)

14. Gingival Recession--Attachment Distance

    In this slide the FGM is on the cementum and the probe is positioned at the midpoint of the mesiobuccal root of the first maxillary molar. The distance from the cementoenamel junction to the free gingival margin is 2 mm. The examiner would call a minus two (-2) for the first call.

15. Gingival Recession--Probing Depth

    The probe is placed at the midpoint of the mesiobuccal root of the 1st maxillary molar. The probing depth is 1 mm. The examiner would call 1 for the second call.

16. Probe Position--Mandibular Molar

    In this slide the probe is positioned at the midpoint of the mesial root of the 1st mandibular molar. The free gingival margin (FGM) is at the CEJ. The FGM/CEJ=0 for the first call, and the probing depth is 1 mm for the second call.

17. Probe Position--Gingival Recession

    In this slide the free gingival margin is on the cementum. The probe is placed at the midpoint of the buccal surface of a mandibular 2nd bicuspid. The distance from the CEJ to the FGM is called (-2) for the first call.

18. Removal of Subgingival Calculus (Discussion slide)

    In this slide subgingival calculus obscures the CEJ at the mesial surface of the right lateral incisor and should be removed using a Columbia curette #13 or #14. The examiner will rarely have to remove calculus in order to detect the CEJ.

19. Insertion and Placement of Curette

    In this slide the Columbia curette is inserted in the mesial interproximal area of the maxillary right cuspid for gross scaling and limited debridement in order to identify the CEJ.

20. Supragingival Calculus Removal

    In this slide supragingival calculus obscures the CEJ at the buccal and mesial surfaces of the mandibular left lateral incisor and should be removed before attachment distance measurements can be made.

21. Estimation of the CEJ

    In this slide several points can be noted. The location of CEJ at the buccal and mesial surfaces of the maxillary central incisor is obscured because of the crown preparation and the composite and amalgam restorations hinder identification of the CEJ on other teeth. On an individual site basis the location of the CEJ will be approximated.

22. Probe Assessments--Temporary Splints

    On the mandibular lateral and central incisors a temporary splint with a wire acrylic combination has been placed. The examiner will measure the attachment distance and probing depth for buccal and mesial surfaces in the usual manner.

23. Probing Assessment--Root Amputation

    In this slide the distobuccal root of the maxillary molar has been amputated. The attachment distance and probing depth measurements can still be made for the mesiobuccal root. Mesial and distal approaches should be evaluated with a #17 explorer for extent of furca involvement.

24. Probing Assessment--Hemisections

    In this slide mesial and distal roots of a mandibular molar have been retained following hemisection. Attachment distance and probing assessments will be made for the mesial root in the customary manner on the buccal and mesial aspects. Furcation calls on the buccal and lingual would be Ys.

25. Orthodontic Banding

    In this slide bands are present on the 2nd molars and all anterior teeth of the lower arch. The examiner will use clinical judgment in deciding which sites can be properly assessed. The Y call is made only for those sites that cannot be measured.

26. Mixed Dentition

    In this slide the mixed dentition is present. The examiner will not probe primary molars. However, as a space holder, "Y" is called for the buccal and mesial sites of the 1st and 2nd permanent bicuspids.

27. Gingival Hyperplasia

    In this slide gingival hyperplasia is present on the upper teeth. The examiner should proceed with the assessment in the usual manner.

28. Crowded Anterior Teeth

In this slide illustrating crowded anterior teeth, the examiner would estimate the mesial sites on the lateral incisors and cuspids.

29. Decalcification and Gingival Inflammation

In the last slide, decalcification on the bicuspids and molars is evident. If the presence of debris obscures the CEJ the examiner should remove the debris with gauze and proceed gently with the probing measurements. A "Y" can be utilized for an individual site if necessary.

PERIODONTAL

LOSS OF ATTACHMENT

SLIDES

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5.10.6 Periodontal Assessment Data Form and Recording Procedures

Page 2 of the Dental Examination Form (Exhibit 5-15) includes gingival assessment, calculus assessment, measurements for loss of attachment and a furcation assessment for two randomly selected quadrants. If the examiner indicates that the periodontal exam cannot be conducted on the participant, the recorder fills in the "Exam Inc" circle in the upper right corner of the Loss of Attachment area of the form.

Gingival Assessment Data Recording Codes. The examiner begins the periodontal exam by conducting the gingival assessment of all teeth, excluding third molars. The circles for scoring gingival assessment are located in the upper left portion of page 2 of the form. Names of teeth are listed in the middle of that section (2nd molar, 1st molar, 2nd bicuspid, 1st bicuspid, cuspid, lateral, central). Unlike the caries exams which started with the central incisor and ended with the 2nd molar, the periodontal exams begin at the back of the quadrant with the 2nd molar and ends in the front with the central incisor. The codes are as follows:

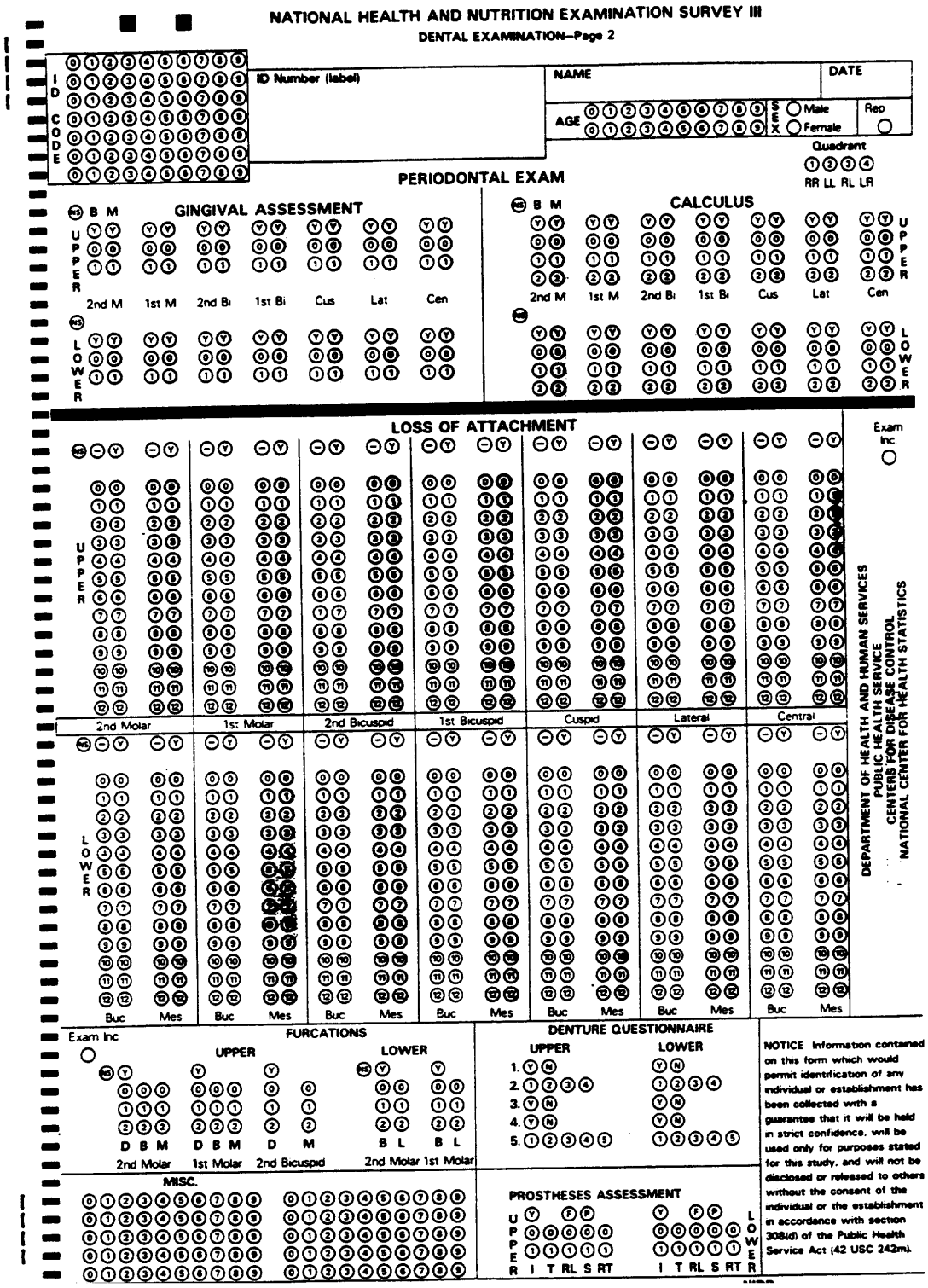
Y	=	A gingival assessment for a particular tooth site cannot be scored,
0	=	No bleeding, and
1	=	Bleeding.

One score must be called for each tooth surface and only a "Y" or a "0" or a "1" may be called. The examiner begins the gingival assessment with the second molar in the upper quadrant. Examine the buccal and mesiobuccal sites of that quadrant, and then assign scores.

The recorder marks the circle containing the code. When the examiner has completed the exam for the designated upper quadrant, s/he examines the designated lower quadrant.

There is a circle labeled "NS" for "no score" at the top of the gingival assessment section for each quadrant. In cases where the gingival assessment cannot be made for one or more quadrants, the examiner calls "No Score for upper quadrant" and/or "No score for lower quadrant." The recorder fills in the "NS" circle(s). If "NS" is marked, all other circles for the quadrant must be left blank.

Exhibit 5-15


NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
DENTAL EXAMINATION--Page 2
ID CODE
ID Number (label)
NAME
DATE
AGE
SEX
Male
Female
Rep
Quadrant
RR LL RL LR
PERIODONTAL EXAM
GINGIVAL ASSESSMENT
CALCULUS
UPPER
LOWER
2nd M
1st M
2nd Bi
1st Bi
Cus
Lat
Cen
LOSS OF ATTACHMENT
Exam Inc
2nd Molar
1st Molar
2nd Bicuspid
1st Bicuspid
Cuspid
Lateral
Central
Buc
Mes
DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL
NATIONAL CENTER FOR HEALTH STATISTICS
FURCATIONS
DENTURE QUESTIONNAIRE
D B M
B L
MISC.
PROSTHESES ASSESSMENT
I T RL S RT
NOTICE Information contained on this form which would permit identification of any individual or establishment has been collected with a guarantee that it will be held in strict confidence, will be used only for purposes stated for this study, and will not be disclosed or released to others without the consent of the individual or the establishment in accordance with section 308(d) of the Public Health Service Act (42 USC 242m).

Calculus Assessment Data Recording Codes. The circles for scoring the calculus assessment are located in the upper right section on page 2 of the Dental Examination Form. The buccal and mesiobuccal sites of each tooth are examined. The examiner conducts the calculus assessment in the same order as the gingival assessment.

The recorder fills in the circles containing the codes that are called. The codes are as follows:

Y = Cannot be assessed,
0 = Absence of calculus,
1 = Supragingival calculus but no subgingival calculus present, and
2 = Supragingival and subgingival calculus or subgingival calculus only.

There are also "NS" (no score) circles for each quadrant to mark if the quadrant cannot be assessed for calculus. If "NS" is marked, all other circles for a quadrant must be left blank.

Loss of Attachment Data Recording Codes. The area for scoring loss of attachment is located on the middle portion of page 2 of the Dental Examination Form. The names of the teeth in a quadrant are listed at the middle of the section beginning with the 2nd molar and ending with the central incisor. First scores for the teeth in the selected upper quadrant are recorded, followed by scores for the teeth in the selected lower quadrant.

Buccal and mesiobuccal sites of each tooth are examined. Scores are assigned for both tooth sites.

There are "No Score" circles at the top left portion of the form to indicate the quadrant(s) which cannot be assessed. If an entire quadrant cannot be examined for loss of attachment, the examiner calls out "no score" for the quadrant and the recorder marks in the "No Score" circle corresponding to that quadrant:

UL = Upper left quadrant,

UR = Upper right quadrant,

LL = Lower left quadrant, and

LR = Lower right quadrant

If "No Score" is marked, all other circles for the quadrant must be left blank.

There is a "Y" code (cannot be assessed) for each surface of each tooth. If a surface cannot be assessed the examiner calls out "Y," and the recorder marks the circle containing "Y" for that surface. Whenever a "Y" code is marked, the two columns of numbers for that surface must be blank. The missing teeth should be the same as those called in the caries exam.

During the loss of attachment assessment, the examiner will first measure the millimeters from the free gingival margin (FGM) to the cementoenamel junction (CEJ). S/he calls out the millimeters and the recorder marks in the number in the first column. The calls range from 0 to 12 millimeters. If this measurement is a negative number, the examiner calls out "minus" before calling the number. The recorder marks in the circle with the minus sign and then marks in the number in the same column. The examiner then measures the millimeters from the FGM to the bottom of the pocket, and the recorder marks the number in the second column for that surface of the tooth.

Furcation Assessment Data Recording Codes. Space is provided on the lower left corner of page 2 of the dental examination form to record furcation scores for the maxillary and mandibular first and second molars and maxillary first bicuspids. The codes are zero, 1, or 2, as follows:

0 - No involvement

1 - Partial involvement, not passing through the furcation. Specifically, when a #3 or #17 explorer definitely can be placed into the furcation and cannot be moved coronally by pulling in the direction of the long axis of the tooth. The probe cannot be passed through the furcation.

2 - Comprises the through and through involvement in which an explorer probe can be passed between the roots through the entire furcation to indicate a through and through bifurcation and trifurcation involvement.

If specific surfaces on the teeth involved cannot be assessed, a call of "Y" will be made for

the identified surface and the recorder will leave that surface space blank on the form. If a tooth is missing, "Y" should be called for all sites on that tooth.

5.11 Restorations, Tooth Conditions, and Prostheses Assessment

5.11.1 Introduction

The objectives of this component of the survey are:

- To determine the prevalence and extent of selected disaggregated physical and biological oral conditions during a dental examination as part of NHANES III.
- To provide a basis for comparisons of dental conditions with future national epidemiological surveys.
- To provide a basis for determining estimates of restorative treatment needs.
- To provide baseline data for possible follow-up of selected population subsamples.

For purposes of this assessment, a dental condition is defined as a physical and biological state that compromises structural integrity or causes dysfunction or disease and that can be corrected with existing dental knowledge. Dental conditions such as fractured restorations, recurrent decay, and retained roots compromise the structural integrity of the dentition, frequently impair oral function, and can result in pulpal disease. Replacement of existing restorations and prostheses represents a noteworthy proportion of treatment currently provided to patients and is likely to increase in importance in the future.

Examiners will examine restorations, tooth structure, and prostheses, assessing the condition of defective restorations, defective crowns and bridges, gross loss of tooth structure, gross pulpal involvement, and defective prostheses according to specific criteria. The data from the national survey will provide the first information on the prevalence and extent of these conditions in the U.S. population, and will be useful as a baseline for comparison with future surveys. In addition, the data will be valuable as information to provide a basis for estimating the amount of dental services needed to treat these conditions.

The diagnostic criteria for this section have been developed using the following references as a basis:

Finkelstein, M.J., Douglass, C.W., and Chauncey, H.H.: Cumulative incidence of need for restorative dental treatment. **J. Dent. Ed**., 49:757, 1985.

Hunt, R., Srisilapanan, P., and Beck, J.: Denture related problems and prosthodontic treatment needs in the elderly. **Gerodontics**, 1:226, 1985.

Maryniuk, G.A. and Kaplan, S.H.: Longevity of restorations: survey results of dentist's estimates and attitudes. **J. Am. Dent. Assn.**, 112:39, 1986.

Maryniuk, G.A.: In search of treatment longevity -- a 30-year perspective. **J. Am. Dent. Assn.**, 109:739, 1984.

Mjor, I.: Placement and replacement of restorations. **Oper. Dent.**, 6:49, 1981.

Ryge, G. and Snyder, M.: Evaluating the clinical quality of restorations. **J. Am. Dent. Assn.**, 87:369, 1973.

5.11.2 Examination Sequence Overview

This examination is conducted in three steps. The first step is carried out immediately after the root caries examination. It consists of tooth by tooth assessments for all permanent tooth spaces (Exhibits 5-16 and 5-17). The second and third steps are carried out after the periodontal assessments. The second consists simply of noting the presence or absence of prostheses, and the third consists of evaluating for the integrity; excessive wear of posterior teeth; the presence or absence of a patient-applied reline material or professionally-applied tissue conditioner or the presence of a denture adhesive; stability; and retention is made. Individuals 18-74 years of age will be examined for all these assessments.

Exhibit 5-16. Classification criteria for restorations and tooth conditions

- **Defective intracoronal restorations -**

  Defective margin on restoration (Code 1)

  Defective margin - the explorer can be inserted to a depth of 1mm or more in the defect in amalgams, composites, and inlays. The dentin is not visible.

  Missing, partly missing, loose, fractured or temporary restoration (Code 2):

  Missing filling - the restoration has been completely lost or a temporary restoration is in place.

  Partially missing filling - any of the following is true:

  - A portion of the original volume of the filling has been lost and dentin is visible.
  - The pulpal floor of the preparation is visible.
  - Cement base is visible.

  Loose filling - the filling is movable within the cavity preparation.

  Fractured restoration - fracture line extends all the way across the filling. Also two fillings that abut one another.

  Recurrent decay associated with an intracoronal restoration (Code 3):

  Recurrent decay - visual and tactile evidence of decay adjacent to a margin.

- **Defective crowns and bridges**

  Recurrent decay on crown or bridge abutment (Code 4):

  Recurrent decay - visual and tactile evidence of decay adjacent to a margin. Mark only the tooth spaces involved.

  Missing crowns or bridges, loose crowns or bridges, or temporary crowns or bridges, broken bridge connectors, and/or missing occlusal veneer material on posterior crowns or bridges (Code 5):

  Missing veneer material on posterior crowns or bridges - which extends across at least one-third of the occlusal surface. Mark only the tooth spaces involved.

  Missing crown or bridge - the crown or bridge has been completely lost or a temporary crown or bridge is in place. Mark all tooth spaces on the bridge.

  Loose crown or bridge - the crown or bridge is movable. Mark all tooth spaces on the bridge.

  Connection of the pontic and its abutment is broken. The score is assigned to the tooth spaces replaced by the pontics.

Exhibit 5-16. Classification criteria for restorations and tooth conditions (continued)

- **Gross loss of tooth structure**

  Gross fracture of tooth structure associated with an intracoronal restoration, crown, or bridge (Code 6):

  Gross fractures of tooth structure associated with restorations -- such as a cusp or more than a cusp of a tooth adjacent to a filling, the prepared portion of a tooth for a crown, or the abutment of a bridge any of which compromises the integrity of the restoration by exposing its margin or causes the loss of the restoration. Or, if such great loss of tooth structure has occurred and no restoration is present, visual evidence or information garnered from questions must confirm the existence of a previous restoration. With these conditions some portion of the tooth extends above the free gingival margin.

- **Pulpal involvement**

  Pulpal involvement - one of more of the following is involved (Code 7):

  - Pulp chamber or canals are open.
  - Periapical abscess with fistula.
  - Pulp polyp is evident.

- **Retained roots**

  Retained roots evident (Code 8):

  Loss of tooth structure for any reason such that no enamel extends above the adjacent gingival margin.

Exhibit 5-17. Restoration and tooth assessment code sheet

CODE SHEET

FOR TOOTH SPACES

Sound tooth	0
Score restorations as follows:	
Defective margin on restoration	1
Missing, partly missing, loose, fractured or temporary restoration	2
Recurrent decay on a restoration	3
Score crowns and bridges as follows:	
Recurrent decay on crown	4
Missing, loose or temporary crowns or bridges, broken bridge connectors, and/or missing occlusal veneer material on posterior crowns or bridges	5
Score teeth with gross loss of tooth structure as follows:	
Fracture of tooth structure associated with a restoration, crown or bridge	6
Score pulpal involvement as follows:	
Pulpal involvement evident	7
Score root caries as follows:	
Retained roots evident	8
Retained deciduous teeth or unerupted and missing but not replaced permanent teeth	Y

Individuals over age 74 who have both full maxillary and mandibular dentures will receive a prostheses examination.

Tooth Assessments. The assessment of teeth is limited to the permanent dentition and is accomplished in the same order as the caries exam. Retained deciduous teeth, unerupted, and missing permanent teeth which are not replaced or are replaced with a removable prosthesis are scored "Y." Teeth with none of the following defects are scored "0." If a tooth meets more than one of the criteria, then the highest numbered code is used. All tooth spaces are scored whether the space is closed or not. For crowns or for bridges with a pontic which replaces more than one tooth space, give both spaces the same score. To save time, quadrants may be scored as a group, all "0's" or all "Y's." These "O's" and "Y's" are at the beginning of each quadrant.

This examination entails the use of a mirror and #23 explorer. The use of the explorer is only for light tactile assessment to confirm visual impressions. However, in the assessment of defective margins, the explorer is used to determine whether the marginal defect is equal to or greater than 1 mm or more in depth. The criteria for recurrent decay are the same as those used for coronal and root caries.

Complete Denture/Partial Denture Assessment. This assessment includes an evaluation of: (1) integrity; (2) evidence of excessive wear of posterior teeth; (3) the presence of patient-applied reline material or professionally-applied tissue conditioner, or the presence of a denture adhesive; and an assessment of (4) stability and (5) retention. The first three of the preceding are accomplished extraorally by the examiner. The last two assessments are made in the patient's mouth. If two partials are present in one arch, evaluate the one replacing the most teeth or if of equal spans, then choose the one on the right. For fully tooth-supported partial dentures, score the two categories -- excessive tooth wear and reline material, conditioner, or denture adhesive-both as 0. Exclude temporary partial dentures, so-called flippers, that are totally tissue-borne all-resin prostheses. Full dentures associated with implants are scored as full dentures. Exhibits 5-18 and 5-19 are guidelines for the examinations, classification criteria, and coding.

Exhibit 5-18. Examination procedure and classification criteria for prostheses

1. Integrity

Each prosthesis is inspected extraorally using the following criteria:

a. fractures of the base material
b. cracks, holes or other defects in the denture base material
c. missing or chipped teeth
   - called for posterior teeth when one half or more of the occlusal surface is missing
   - called for anterior teeth when the remnant tooth material does not completely cover the denture base material
d. broken clasps, rests, or broken portions of the framework

The following calls are possible:

0 - None of the preceding criteria are met (acceptable repairs are scored "0")

1 - At least one of the preceding criteria is met

2. Excessive Tooth Wear

While still holding the prosthesis, the examiner assesses the bicuspids and molars for excessive tooth wear. The prosthesis has excessive tooth wear if <u>either</u> of the following two criteria are met on <u>at least</u> half of the posterior teeth:

a. the teeth lack occlusal anatomy, i.e., both mesial and distal fossa are not discernible
b. the teeth are chipped

The following calls are possible:

0 - None of the preceding criteria are met

1 - At least one of the preceding criteria is met

3. Temporary Reline Material, Conditioner, or Denture Adhesive

The full denture and free-end partial denture are examined out of the mouth for the presence of a temporary reline material, a tissue conditioner, or a denture adhesive. Presence of reline material, tissue conditioner, or adhesive must be evident. If the examiner suspects the presence of adhesive, s/he may question the SP as to whether adhesive is used. However, denture adhesive must be evident in dentures before a call of "1" can be made.

The following calls are possible:

0 - None of the preceding criteria are met

1 - At least one of the preceding criteria is met

Exhibit 5-18. Examination procedure and classification criteria for prostheses (continued)

For the last two assessments, the prosthesis is examined in the mouth. However, if the prosthesis meets any of the criteria in #3, there is no need to assess it for stability or retention. Codes of 1 are given for both.

4. Stability

Stability is defined as the ability of the denture to withstand forces of dislodgement in a horizontal direction and is usually thought of as the relationship of the denture base to the underlying bone.

For complete dentures, first, unilateral alternating force is applied to the 1st molar occlusal surface areas with the index fingers. Second, the denture is manually moved laterally. Movement should be directly lateral, and not rotational or torquing movement. If with either force the prosthesis moves 2 mm or more in one direction, the prosthesis lacks stability.

For partial dentures, apply unilateral and bilateral force to the denture base or to the stress bearing areas. If rotation or lifting of rests and/or indirect retainers of 1 mm or more or movement equivalent to the diameter of a periodontal probe is detected, then the prosthesis lacks stability.

The following calls are possible:

0 - The preceding criteria are not met

1 - The preceding criteria are met

5. Retention

Retention of a removable prosthesis is defined as the ability of the prosthesis to withstand forces of dislodgement in a vertical direction and depends upon the relationship of the denture base to the soft tissue.

The following criterion is used for both complete prostheses and partial dentures:

a. The denture dislodges when the patient opens the mouth moderately wide but without strain. The examiner asks the SP to open comfortably wide, but without strain.

The following calls are possible:

0 - The preceding criteria are not met

1 - The preceding criteria are met

Exhibit 5-19. Complete denture/partial denture assessment code sheet

CODE SHEET

Integrity	
Criteria are met	1
Criteria are not met	0
Excessive Tooth Wear	
Criteria are met	1
Criteria are not met	0
Reline Material, Conditioner or Denture Adhesive	
Criteria are met	1*
Criteria are not met	0
Stability	
Criteria are met	1
Criteria are not met	0
Retention	
Criteria are met	1
Criteria are not met	0

*If a 1 is coded, then codes of 1 are automatically given for stability and retention.

SLIDES ILLUSTRATING CONDITIONS

1. Defective Margin of Amalgam

   Several tooth conditions are evident in this slide. Focusing on the lingual surface of the tooth with the restoration and adjacent to the cusp, a defect exists in the restoration. Assuming that the defect is 1 mm or more and dentin is not visible, a score of 1 is called.

2. Partially Missing Filling

   This molar has a portion of the MOD filling on the proximal that is missing. Score 2.

3. Fractured Restoration

   This lower molar has a fractured amalgam all the way across the occlusal surface. Score 2.

4. Recurrent Decay

   This slide shows recurrent caries on the mesial surface of the upper first bicuspid.
   Score 3.

5. Recurrent Decay

   A restoration is missing in this slide; however, recurrent decay is evident and takes precedence. Score 3.

6. Recurrent Decay - Crowns

   This slide shows recurrent caries at the buccal crown margins of the lower first and second molars. Score 4.

7. Broken Connection of Pontic and Abutment

   This slide shows a fractured bridge connector between the upper central and lateral incisors. Score 5.

8. Fractured Cusp Exposing Filling

   This slide shows fractured lingual cusps adjacent to an amalgam restoration of a lower first molar. Score 6.

9. Periapical Abscess

   This slide shows a fistula resulting from a periapical abscess of a molar abutment. Score 7.

10. Pulp Polyp

    On this slide, a pulp polyp is evident in the lower first molar. Score 7.

11. Retained Roots

    This slide shows the retained roots of three maxillary teeth. Score 8.

12. This slide illustrates a fracture of a partial denture, a defect in the integrity of the prosthesis.

13. This slide illustrates a crack in a maxillary denture, a defect in integrity.

14. Hole in Denture Base

    This slide illustrates a hole in the denture base material, a defect in integrity.

15. This slide illustrates chipped porcelain teeth in a denture, but less than one-half of the occlusal surface is missing. The call is 0.

16. Missing Occlusal Rest

    This slide presents an example of a partial denture with a missing occlusal rest on the mesial clasp, a defect in integrity.

17. This slide illustrates a failed professionally applied silicone liner, a defect in integrity.

18. This slide also illustrates a failed professionally applied silicone liner, a defect in integrity.

19. Excessive Prosthetic Tooth Wear

    This slide shows varying degrees of excessive wear on the posterior teeth of a denture. If one half or more than 1/2 of the teeth meet the criteria, the call should be #1.

20. Excessive Prosthetic Tooth Wear

    This slide illustrates varying degrees of excessive wear on posterior teeth of a denture. If one half or more than 1/2 of the teeth meet the criteria, the call should be "1".

21. Excessive Prosthetic Tooth Wear

    This slide illustrates varying degrees of excessive wear on posterior teeth of a denture. If one half or more than 1/2 of the teeth meet the criteria, the call should be "1".

22. Excessive Prosthetic Tooth Wear

    This slide illustrates excessive wear on posterior teeth of a denture, an excessive tooth wear call of 1.

23. Denture Conditioner

    This slide shows a professionally-applied tissue conditioner on a prosthesis.

24. Patient Applied Reline Material

    This slide illustrates a patient applied denture reline material.

25. Permanent Processed Reline Material

    This slide illustrates a processed permanent resilient liner. This would not meet the criteria for a temporary reline material.

26. Inadequate Stability

    This slide presents an example of inadequate stability. Notice that unilateral pressure on the denture area caused lifting of the framework and rests on the opposing side. The call is 1.

27. This slide illustrates a swinglock removable partial denture. If the partial denture unlocks with pressure on the edentulous area and/or the retentive fingers move 1 mm or more incisally, the partial denture is unstable.

RESTORATIONS,

TOOTH CONDITIONS,

PROSTHESES

SLIDES

HERE

5.12 Recording Information on the OPSCAN Dental Data Forms

As mentioned earlier, hard copy data forms will be used if there is a problem with the automated system. The dental examiner examines each SP and "calls" the exam findings to the dental recorder who records the examiner's observations on the appropriate Dental Data Forms. The recorder should never guess at a call or try to remember it and fill it in later. The recorder should not hesitate to ask the examiner to go slower or to repeat a call. Accuracy is very important. All of the recording procedures explained in the previous sections are done by the recorder, but the dentist is expected to help edit the forms.

Data that are recorded on hard copy forms will have to be entered into the automated system by the dentist. Health technicians (recorders) will be busy entering data from other components. The MEC Manager will schedule a time when the data are to be entered because he/she will have to prepare the MEC system (set the session, etc.) for the data entry and all exam components will have to be entered at the same time. It is important that hard copy forms are completed clearly and carefully.

Exhibit 5-20 shows the correct and incorrect ways to mark the circles.

Editing the Dental Data Forms. After the examination, the recorder and examiner must edit the hard copy Data Forms while the SP is still in the dental chair. The automated system will automatically edit data as they are being entered. The purpose of the manual edit is to make certain that we have the most accurate information possible. If data are missing or inconsistent, or if the forms are incorrectly filled out, the estimate of the prevalence of oral health problems in the U.S. will be inaccurate. After the edit has been completed, the recorder should immediately file the completed Data Forms in a temporary file to avoid damage to the forms.

Exhibit 5-20. Dental data form marking instructions

MARKING INSTRUCTIONS

- Use # 2 black lead pencil.
- Do not use ink, ballpoint or felt tip pen.
- Make black marks that fill the circle.
- Erase cleanly any changes you make.
- Make no stray marks on the form.

Edit Check List. The following edit checks must be conducted on each Dental Data Form:

- Incomplete or light marks must be completed or darkened with No. 2 black lead pencil.
- Extraneous marks must be completely erased.
- Filled in circles for identification must correspond exactly with the written information at the top of the forms.
- Name, ID, Date, Age, Sex: Check to be sure that these items are consistent on every form used for that SP.
- Check for missing data.
- Make certain that missing teeth correspond exactly for all assessments.

The Oral Mucosal Exam Form (page 3) must have the following items edited:

- Location. One or more marks must be made on either or both diagrams.
- Clinical Diagnosis. A separate form must be filled out for each condition present on an SP, and only one circle per form must be marked. If "Other" is marked, there must be a diagnosis written on the designated line(s).
- Clinical Description. This section must be completed if Candidiasis, Erythroplakia, Leukoplakia, Lichen Planus, Tumor (non-specific), Ulcer (non-specific), or "Unknown" was marked in the Clinical Diagnosis section. These conditions are identified with CD on the Oral Mucosal Examination Form. One circle must be marked for each of the 8 items listed. For some items, more than one circle can be marked.

The Dental Caries Examination Form (page 1) must have the following items edited:

- If the Coronal Assessment indicates a missing tooth ("E", "ER", "M", or "MR"), then most other indices must be missing ("Y") for that tooth also. It is extremely important that these teeth are in exact correspondence for all assessments.
- In the Coronal Caries Assessment, if a tooth code "C", "U", "E", "ER", "M", "MR" or "Y" is scored, all other marks for that tooth in the box must be blank. For tooth code "S," the only other score that can be marked for that tooth is "A".

- Dental Caries Assessment. Check for multiple marks on the same line in the first row of the tooth box and each column of surface codes. There should be none.

The Periodontal Exam Form (page 2) must have the following items edited:

- Missing teeth: If "U," "E," "ER", "M", or "MR" is marked for any tooth on the caries form, a "Y" must be entered for that tooth on all periodontal assessments.

- Loss of Attachment: If "Y" is scored for a surface in a periodontal assessment, no other mark can be made for the surface of the tooth in that assessment.

6. ORAL EXAM-RELATED FORMS AND PROCEDURES

This chapter describes exam-related forms and procedures that the dentist is responsible for completing. These procedures include completing a report of findings that is provided to SP's, making referrals to the SP's dentist if necessary, completing the referral contact log, and shipping oral mucosa slides.

Shipping of data diskettes and data forms and other exam-related forms; dental exam room setup at the start of a stand; dental exam room packup at the end of a stand; completing an inventory of the dental room supplies; reconciling SP's listed on the dental log with SP data that appear in the automated system or on hard copy; and completing the control record and dental room log are also the responsibility of the dentist. Basic information on inventory procedures, packup, teardown, shipment of data and forms and the Control Record is provided in Attachment B, NHANES III Standard MEC Operations.

6.1 Dental Exam Daily Log

The daily log must be completed for each session of the work week. A copy of the log is shown in Exhibit 6-1. At the top of the form, enter the Stand Number, Location of Stand, your examiner I.D. number, the session date, and indicate the time of the session.

For each SP examined, enter the SP number or attach a barcoded label with the SP number, age of SP, the Recorder I.D. #, time exam started, time exam ended (when SP left room), random quadrant selection for each SP will be recorded under "comments." Usually the recorder will enter most of the information but the dentist must make sure all portions of the forms are accurately completed. Any unusual occurrences or observations should be noted in the comments column.

The original set of logs should be returned to Westat at the end of the stand.

Exhibit 6-1. National health and nutrition examination survey III dental log

National Health and Nutrition Examination Survey III
Dental Log

Stand Number _____ Date: ____/____/____

Location _____ Session AM PM EVE

Examiner # _____

SP ID #	Age	Recorder #	Time In/Time Out	Completed Yes No	If no, reason/ other comments
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	
			__:__/__:__	☐ ☐	

6.2 Completing the Recommendations for Dental Care

The oral examination included in this survey does not take the place of a dental checkup, treatment by one's own dentist, or routine dental care since no radiographs are taken and the SP's history is not available to you. Rather the exam is designed to achieve the research objectives. Therefore, NIDR, NCHS, and Dr. Ley have attempted to develop a procedure for alerting SP's to the need for followup care or the need to continue regular dental care that takes the limits of the exam into consideration.

The report of dental findings called Recommendations for Dental Care (see Exhibit 6-2) should be completed for each SP. This report makes recommendations about the need for dental care. At the conclusion of the examination the examiner will tell the recorder which of four boxes to check on the Recommendations for Dental Care, indicating whether the SP should (a) see a dentist immediately; (b) see his/her dentist within 2 weeks; (c) see his/her dentist at the earliest convenience; or (d) continue his/her usual dental care. The report will be on 3-part paper. One copy should be placed in the SP's folder for the coordinator to give to the SP; one copy is sent to Westat; and one copy goes to NCHS.

6.3 Making Referrals for Dental Care - Completing the Notification of Dental Examination Findings, and Dental Referral Log

If you determine that an SP must see his/her dentist for dental care immediately or within the next two weeks, you will be expected to (1) contact the SP's personal dentist by telephone to explain the SP's condition and need for immediate care; (2) complete a Notification of Dental Examination Findings form to mail to the SP's personal dentist as a followup to the phone call; and (3) complete the Dental Referral Log.

Exhibit 6-2. Recommendation for dental care

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control

National Center for Health Statistics
6525 Belcrest Road
Hyattsville, MD 20782

NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III

RECOMMENDATIONS FOR DENTAL CARE

Name _____ Sample No: _____

Date of Examination _____

The dental examination of the National Health and Nutrition Examination Survey is not, and is not intended to be, a substitute for the examination usually given to persons seeking care from their own dentists. Neither a dental history nor x-rays are taken, and therefore the findings are solely the result of what can be seen at the time of the examination.

The examining dentist recommends that you:

- ☐ Contact your dentist immediately. This office will also contact your dentist about this referral.
- ☐ See your dentist within 2 weeks. This office will also contact your dentist about this referral.
- ☐ See your dentist at your earliest convenience.
- ☐ Continue your regular routine care.

CDC 64.12
06/90

OMB No.0920-0237

*U.S. GPO: 1992-312-086/61725

6.3.1 Contacting the SP's Personal Dentist by Telephone

Arrangements will be made at each stand to have available the name and address of a public health or community clinic to which SP's who do not have their own dentist can be referred. The coordinator, dentist and physician will receive a memo with this information at each stand.

If an SP requires immediate care, or care within the next two weeks ask the SP if you may contact his/her dentist or the public health clinic about the problem. If the SP agrees, obtain the address and telephone number of the SP's dentist from the SP and call the SP's dentist or dental clinic. If the SP refuses, you may not contact the SP's dentist by telephone or in writing. The following procedures should be used when making the call:

- Without making a diagnosis, explain the SP's condition.
- Express your concern about what you observed and emphasize that it is very important that the SP see his/her dentist immediately.
- Explain that you did not do a full-scale examination (that was not the intent of the study), no x-rays were taken, you are not familiar with the SP's dental history; and that your findings may differ from a more thorough evaluation by the SP's dentist.
- Explain that in the next few days you will be sending a letter to the dentist which documents what you found.

There may be occasions when you cannot reach the SP's dentist by telephone. In this case, document on the Dental Referral Log the fact that you tried to call but were unsuccessful.

6.3.2 Completing the Notification of Dental Examination Findings

When the SP requires immediate care or care within the next two weeks, you will be completing the Notification of Dental Examination Findings to sent to the SP's dentist. You must have the permission of the SP to send this letter, which will serve to document the problem you found and to reinforce tot he SP's dentist the serious nature of the problem you may have identified. Exhibit 6-3 is a copy of the notification form. Check the main reason for the referral. For all recommendations other than "continue your current care" include a brief written comment on the form because of the

Exhibit 6-3. Notification of dental examination findings

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control

National Center for Health Statistics
6525 Belcrest Road
Hyattsville, MD 20782

NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III
NOTIFICATION OF DENTAL EXAMINATION FINDINGS

DATE: _____

NAME: _____

ADDRESS: _____

_____

Dear Doctor:

Recently, the person named in this report was among those who had voluntary examinations at special mobile facilities operated by the U.S. Public Health Service. The dental examination of the National Health and Nutrition Examination Survey is not, and is not intended to be, a substitute for the examination usually given to persons seeking care from their own dentists. Neither a dental history nor x-rays are taken, and therefore the findings are solely the result of what can be seen at the time of the examination. The examinee asked that this report be sent to you.

The examinee was referred to your office for immediate evaluation or treatment of the condition(s) checked below:

☐ Clinical impression of soft tissue condition _____

_____

☐ Other condition(s) _____

_____

You should already have been contacted about this person by our examining dentist. If you have not yet been contacted for an appointment, please notify the examinee of the need for follow-up as soon as possible.

Name of Examinee: _____ Sample No.: _ _ _ _ _ _ _ _

Address: _____ Age: _____

_____ Date of Examination: _____

Telephone: _____

If you have any questions about the survey, please call me collect on (301) 436-8267, 8:00 a.m. to 4:00 p.m.

Sincerely yours,

Marsha G. Davenport, M.D., M.P.H.

OMB No. 0920-0237
CDC 64.16
REV. 09/91

seriousness of the condition. Comments should be limited to the following approved descriptions:

- Decayed teeth
- Gum condition
- Oral hygiene problem
- Problem with filling
- Problem with denture
- Oral soft tissue lesion

This description should not provide a detailed diagnosis. Avoid descriptions which are references to specific tooth surface, specific treatment needs or statements indicating a specific diagnostic classification.

The letter will be presigned by the NCHS NHANES III physician and is produced on 3-part paper. Please give the original to the SP and send one copy to NCHS, and one copy to Westat. The NCHS copy should be sent promptly to:

Receipt and Control, Survey Operations Branch
Division of Health Examination Statistics
National Center for Health Statistics
3700 East-West Highway, Room 1-43
Hyattsville, MD 20782

This will ensure that the Chief Medical Officer for the survey at NCHS is informed about each SP requiring immediate dental care. The Westat copies of the notification can be sent to Westat at the end of the stand.

6.3.3 Completing the Dental Examination Referral Log

Any time you identify an SP who requires a referral for care (either immediately or within two weeks), you must complete the referral log. This log should be completed even if the SP refuses to

allow you to call his/her dentist, or if you are unsuccessful in reaching the referral dentist by phone. The log provides a means for documenting your actions with respect to informing the SP about his/her condition and your attempts to direct the SP to care.

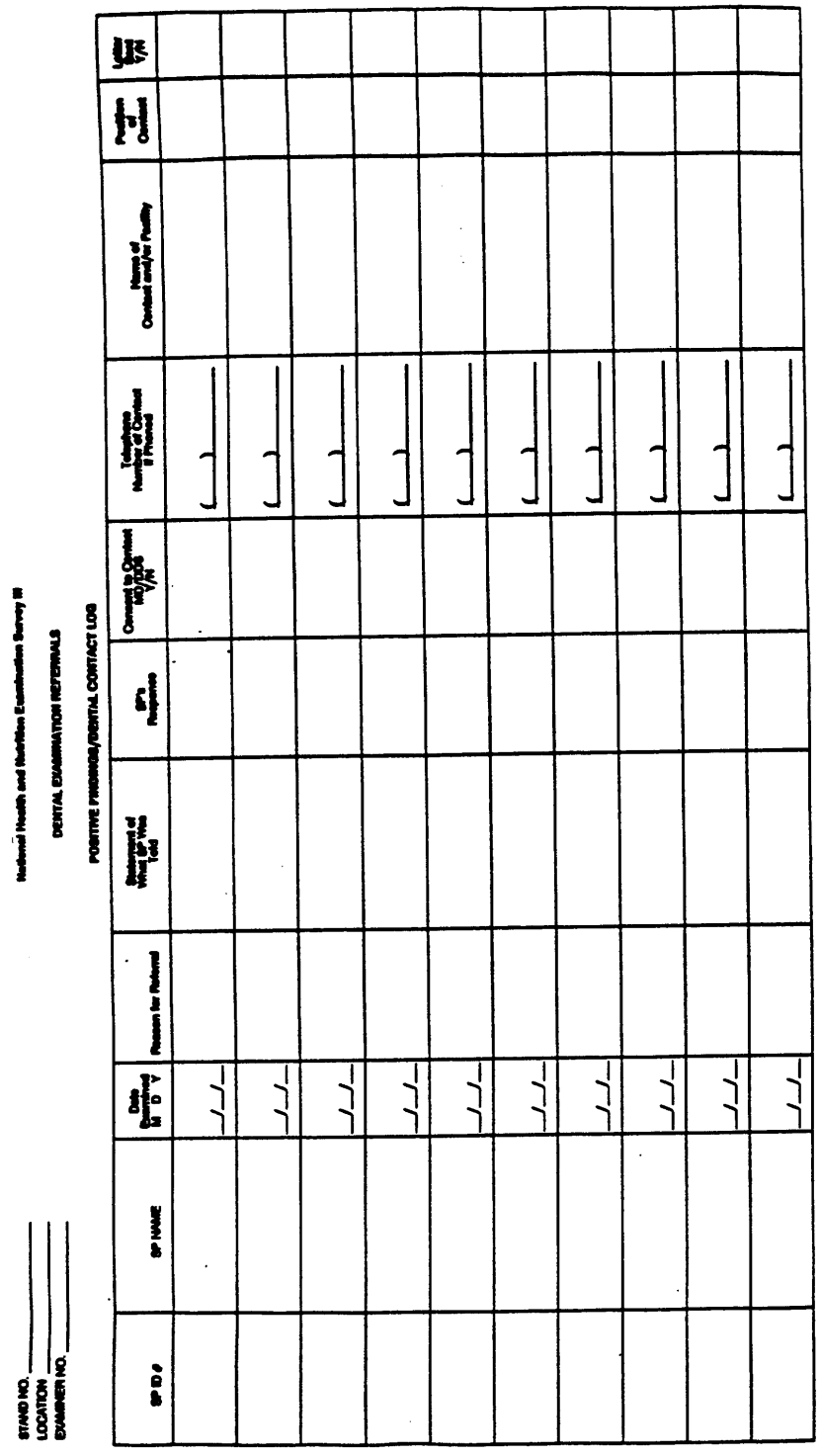
Exhibit 6-4 is a copy of the referral log. The log should contain the following information for each SP who requires referral:

1. SP ID and Name - Use the ID label in column 1 and write in the SP name.
2. Date Examined - Self evident.
3. Reason for Referral - Be sure to indicate the level of referral (1 = immediate care, 2 = within 2 weeks) as well as a brief description of the problem.
4. Statement of What the SP Was Told - Self evident.
5. SP's Response - Indicate whether the SP seemed to understand the seriousness of the problem.
6. Consent to Contact MD/DDS - If the SP refuses to allow you to contact his/her dentist, indicate this and have the SP initial the log.
7. Telephone Number of Contact - Self evident.
8. Name of Contact and/or Facility - Self evident.
9. Position of Contact - Indicate whether your final conversation took place with a dentist, facility administrator, nurse, hygienist, receptionist.
10. Letter Sent - Indicate whether you sent the Notification of Dental Findings.

6.3.4 Criteria for Referral

This section is provided to help the examiner choose the appropriate box (Box A, B, C, or D) of the "Recommendations for Dental Care" form (Exhibit 6-2).

Exhibit 6-4. Positive findings/dental contact log



National Health and Nutrition Examination Survey III

DENTAL EXAMINATION REFERRALS

STAND NO. _____
LOCATION _____
EXAMINER NO. _____

POSITIVE FINDINGS/DENTAL CONTACT LOG

SP ID #	SP NAME	Date Examined M D Y	Reason for Referral	Statement of What SP Was Told	SP's Response	Consent to Contact MD/DDS Y/N	Telephone Number of Person to Phoned	Name of Contact and/or Facility	Position of Contact	Letter Sent Y/N
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			
		_/_/_					(___)___			

It is widely recognized by the American public that susceptibility to plaque-induced carious and/or periodontal lesions is both universal and continuous throughout the life of the dentition and that a periodic examination by a professional is an effective means of averting the serious sequelae which may develop due to failure to treat these lesions at the appropriate time. It is, therefore, justified, following examination, to advise that the examinee "continue regular routine dental checkups." Since a considerable proportion of our population does not, for a variety of reasons, receive appropriate treatment at an appropriate time, it is the examiner's ethical responsibility to advise examinees to "see the dentist at their earliest convenience" when such advice is warranted. There will be a small number of SP's who should seek treatment immediately, and it is the examiner's responsibility to inform the appropriate individuals about the urgency of the situation.

The choice of referral for "routine care" or "within 2 weeks" or "at the earliest convenience" or "immediate care" requires careful consideration based first on the examinee's welfare but tempered by the realities of dental practice. For example, it is inappropriate to refer examinees for care at "the earliest convenience" for decayed primary teeth if it is likely that those teeth will exfoliate before developing into sources of pain or infection. An inquiry about current or pending treatment status should be made to avoid the inappropriate referral of examinees currently under care or scheduled for examination in the near future.

You should not identify the specific teeth or surfaces about which you are concerned, nor is it necessary to list the specific condition listed on the guidelines on the Recommendations for Dental Care form. By doing so you may inadvertently misdirect the SP's dentist's attention away from another problem. Since the NHANES III exam is not diagnostic, you do not want to discourage the SP's dentist from making an independent evaluation.

Recommendations for care for young children should be based on the recommendations of the American Dental Association and other organizations. These organizations recommend that children have their first dental visit by age 2. Children over 2 who have never had a check-up should be encouraged to have one; children with no problems who have seen a dentist should be encouraged to "continue regular care."

If you feel the situation warrants it, you may ask the MEC physician to assume responsibility for the SP. This would be especially appropriate when you discover an oral condition with significant medical ramifications (e.g., hairy cell leukoplakia).

The guidelines in Exhibit 6-5 are offered to assist examiners with their choice of the appropriate box. As mentioned above, the realities of dental practice must be kept in mind in making the final choice.

6.4 Shipping Oral Mucosal Slides

As mentioned in Chapter 5, the candidiasis specimen is obtained by scraping the lesion with a sterile tongue blade and placing the specimen on a slide. We suggest that you prepare and sterilize several oral lesion simmer sets and have them ready at the time of exam. An oral lesion smear set consists of a tongue blade and slide placed in a Chemiclave bag for sterilization and storage.

If you need to add a drop of water to the slide (for example for angular cheilitis), you should ask the recorder to do this for you. The dropper bottle of H_20 is on the shelf over the computer or in the second drawer. The lab has distilled H_20 to fill the large red H_20 bottle under the sink.

Take two SP labels from the SP's chart. One is placed on the Candidiasis Transmittal form, one is placed on the slide. In pencil write the slide number, the date, the diagnosis number, and the SP number on the frosted portion of the slide. The slides should be numbered consecutively within each stand. Place the slide in a polyform box (located in drawer #2) for shipping. Tape the box closed before shipping. Ship the slides once each week.

Complete the Candidiasis Smears Transmittal sheet (see Exhibit 6-6). Write in the slide number (this must correspond to the number on the slide), place an SP ID label in the appropriate space, write in the Recorder ID number, the date the slide was made, a brief description of your clinical impressions, and the location numbers of the lesions.

Exhibit 6-5. Guidelines for dental records

GUIDELINES FOR DENTAL REFERRAL

Recommendation A (immediately)

Only if lesion requires immediate treatment due to the SP's symptoms or the condition of the lesion.

Recommendation B (within 2 wks.)

(1) Kaposi's sarcoma
(2) Leukoplakia
(3) Nevus
(4) Degree 3 smokeless tobacco lesion (possible C)
(5) Hairy leukoplakia
(6) Erythroplakia
(7) Candidiasis
(8) Actinic keratosis (possible C)
(9) Lichen planus
(10) Any non-specific tumor and ulcer or unknown lesion which in the opinion of the examiner requires attention within 2 weeks
(11) Any other condition not listed above which in the examiner's judgment requires attention within 2 weeks

Recommendation C (earliest convenience)

(1) Any condition that necessitates extraction of a primary tooth
(2) Deep carious lesions which in the examiner's best judgment likely will progress to a painful or infectious stage prior to the receipt of treatment
(3) Fractured teeth which are painful or in the examiner's judgment esthetically or functionally unacceptable or are at risk of further deterioration from decay, devitalization or additional fractures
(4) Severe gingivitis with edema, hypertrophy, spontaneous bleeding, heavy deposits of calculus
(5) At least one site with loss of attachment which in the examiner's judgement warrants further attention
(6) Excessively mobile permanent tooth or teeth
(7) ANUG
(8) Angular cheilitis
(9) Denture lesions
(10) Frictional white lesions
(11) Galvanic white lesions
(12) Gingival hyperplasia
(13) Herpetic gingivostomatitis
(14) Mucocele
(15) Papillomas/warts
(16) Degree 1 and 2 smokeless tobacco lesions
(17) Degree 3 smokeless tobacco lesions (possible box B)
(18) Median rhomboid glossitis
(19) Any non-specific or unknown lesions (which in the opinion of the examiner require attention at the earliest convenience)
(20) Any condition in the oral region not included under the criteria listed above which in the examiner's judgment would require attention at the "earliest convenience." Examples of such conditions would be tissue impingement or gross malrelationships or malalignments which now or in the future are likely to interfere with the examinee's functional well being. Also among such conditions are instances of painful pericoronitis which are unlikely to subside without professional intervention.

Recommendation D (continue regular care)

This applies when none of the previous conditions are found.

Exhibit 6-6. Candidiasis smears transmittal sheet

NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III

Stand Number _____ Examiner #: _____

Location _____ Date: ____/____/____

Slide #	SP ID #	Recorder #	Date Taken	Clinical Impression	Location #'s
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		
			__/__/__		

Each week oral mucosal slides should be shipped to the contract laboratory at the following address:

Maryland Medical Laboratory
1901 Sulphur Spring Road
Baltimore, MD 21227

Place the polyform box(es) in a large, padded manilla shipper (envelope). Ask the MEC Manager for shippers. Also place a copy of the Candidiasis Transmittal form in the shipper with the slides. The original transmittal form is sent to NCHS at the time of shipping; a copy is sent to Westat at the end of the stand. Tape and staple the shipper closed. Place a mailing label on the shipper. (These are located in drawer #3). The MEC Manager can arrange to have the shipper mailed.

6.5 Dental Sterilization Log

The Dental Sterilization Log should be used to track and document cleaning and sterilization of used instruments, cleaning of the Chemiclaves and results of spore tests. A copy of this log appears in Exhibit 6-7.

Some spore test results frequently will not return by the end of the stand so test results are sent to the Director of MEC Operations at Westat, and then forwarded to the appropriate MEC to be recorded.

At the end of the stand, one copy of the log should be sent to NCHS, and one copy to Westat. The original log should be kept in the field in the Dental Examination Room.

6.6 Equipment Maintenance Log

The Dental Equipment Maintenance Log (Exhibit 6-8) should be completed whenever maintenance or repair of dental instruments or equipment is required. Replacement of dental instruments should also be noted on this log.

Exhibit 6-7. Dental sterilization log

NHANES III
Dental Sterilization Log

Sterilizer No. _____ Stand No. _____
Examiner No. _____ Location _____

Spore Test	
Date	Results

	Cleaning		
Dates:			

Date	Pressure psi	Expo. Time min.	Date	Pressure psi	Expo. Time min.

Exhibit 6-8. Dental equipment maintenance log

DENTAL EQUIPMENT MAINTENANCE LOG

Date	Equipment	Serial #. NIH #	Service	Where Serviced	Examiner #

6.7 Specific Beginning and End-of-Stand Procedures for Packing up the Dental Room, Shipping, and Miscellaneous Tasks

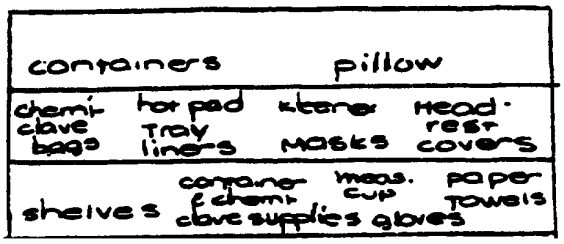
Although general procedures for MEC setup, pack-up, and end-of-stand shipping are provided to you in Attachment B, NHANES III Standard MEC Operations, there are a number of tasks that are specific to the dental exam that the dentist must complete at each stand. These are outlined below.

You will note that a great deal of detail is provided. This is necessary since you will not always be working in the same MEC. If all dentists do not store things in the same places, you will not be able to find anything when you arrive at the MEC.

6.7.1 Setup - Beginning of the Stand

- Inventory the dental exam room and belly compartment. Add newly shipped items to the existing list before taking inventory.
- Clean cabinet shelves and doors, drawers, counter tops, walls, shelves, and computer. Wipe down chairs, light, and compressor. Wash any containers that are not clean.
- Wipe down biohazard waste container and insert a biohazardous waste bag from the lab.
- Place trash bag in the wastebasket; clean if necessary. Trash bags are in the closet in the staff room. (This is done during the stand by the cleaning service.)
- Remove 3 stack shelves from the cabinet and set them on the shelf over the computer. Stock with the three types of hard copy forms. Recorder pencils, erasers,and plastic clips belong on this shelf along with the small distilled H_20 bottle for the slides. There is a small round container for the clips and erasers.

- Set the remaining 3 stack shelves in the lower left corner of the upper cabinet. Forms and folders can be located on these shelves or in the bottom drawers. Set up cabinet as diagrammed.



- All instrument sets and oral lesion smear sets should be in the top drawer, sterilized and ready to use.

- Curettes, tongue blades, slides, sharpening stone, polyform boxes, gauze, etc., should be in 2nd drawer.

- Pens, pencils, labels, tape, envelopes, scissors, etc., are located in the bottom drawers to be arranged and located for your convenience.

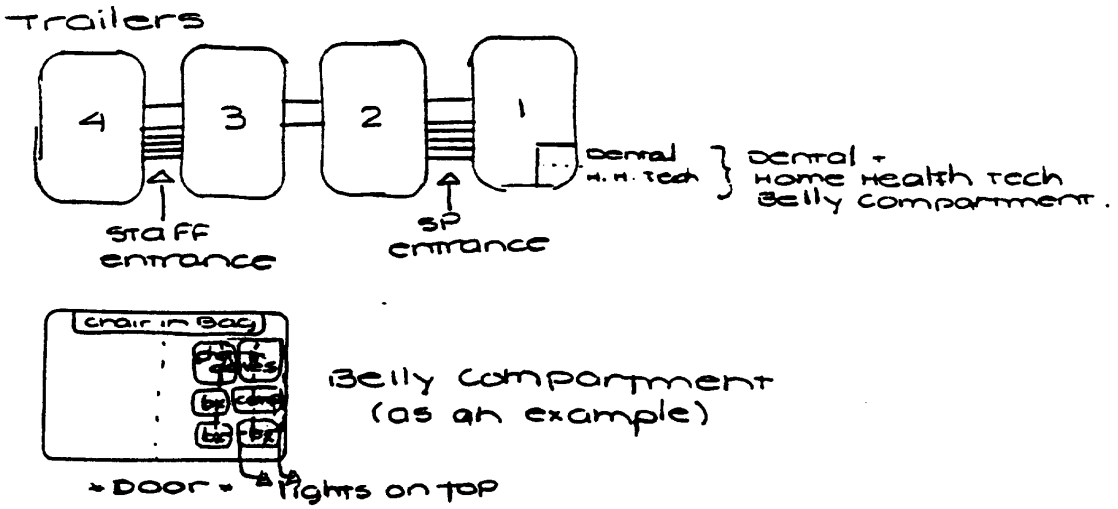
- All bottles (Vitaphene, soaps, cleaners, Vaposterile, Cidex, etc.) are located in the cabinet under the sink. You will also find reusable rubber gloves, funnel, extra measuring cup, Handiwipes, washcloth, and other cleaning items.

- Set up the dental chair and stools. Remove the light, Chemiclave, and Chemipurge from their cases. The light goes on the pole on the chair. The MEC Manager will have the allen wrenches if the pole needs to be adjusted. The Chemiclave goes on the counter and the Chemipurge as diagrammed in Exhibit 3-4. Unbox the compressor and set it up with its footpedal on the wall side of the chair. The light and compressor plugs need to go into a 3-to-1 adapter; then plug into the outlet under the computer with the 6-foot extension cord.

- Fill the plastic jar with Cidex solution (1/5 activator to 3 cups solution). The glass jar from the compressor should be under the sink, and the plastic Cidex jar goes in its place. Keep the Cidex solution covered.

- The extra light, compressor, and the Chemiclave go into the belly compartment along with the empty light and Chemiclave/Chemipurge cases. All extra supplies such as gloves, masks, bottle, etc., should be boxed neatly and placed at the front of the belly compartment for easy access. The MEC Manager will have keys.

- Hand curtain in doorway. Rod should already be in place.



- Arrangement of Forms
  - Inventory worksheets - yellow folder,
  - Transmittal sheets - yellow folder,
  - Dental logs - green folder,
  - Completed dental logs and daily appointment schedules - green folder,
  - Shipping forms - red folder,
  - Referral log - large blue folder,
  - Referral letters - red folder,
  - Exit interviews** - blue folder,
  - Sterilization and maintenance logs - small notebook,
  - Computer forms and information - blue folder, and
  - Dental care forms.

*If you are the last exam for the SP for the session, complete this interview. Be sure to fill in the times and your numbers on the front of the SP's chart.

Complete Dental Care Form for each SP at the end of the exam. Give the form to the SP or place it in the SP's chart for the coordinator to give to the SP at the time of exit.

6.7.2 Miscellaneous Daily Tasks

Setup

- Fill instrument containers with a 1:32 solution of Vitaphene--one container for mirrors and one container for all other instruments.

  1/4 oz. Vitaphene to 1 cup H_20
  2 cups solution per 1 quart rectangular container

  A 2-cup measuring cup and a 4-oz. measuring cup come with the Vitaphene. Vitaphene is under the sink.

- Gloves, paper towels, two small round containers (one with gauze and one for Vitaphene soaked gauze), and a measuring cup are in the upper cabinet. Extra supplies are in the cabinet, the drawers, or in the belly compartment. If you can't find what you need, ask the MEC Manager.

- Sterilized instruments are in the top drawer.

- Tongue blades and slides are in the second drawer. Prepared tongue blade and slide packages and curettes are in the top drawer.

Between SP's

- Place the used instruments and mirrors into their Vitaphene solutions.
- Throw all used disposable items into the biohazardous waste container.
- Wipe counter top, light head, air tip, chair head, etc., with Vitaphene.
- Change headrest covers on the pillow if it was used; use 2 covers.

Closing

- Wrap the air tip and light head with Vitaphene-soaked gauze.
- Scrub the instruments with the brush and Ivory liquid. Dry with paper towels. Throw the towels into the biohazardous waste container. Wipe the mirror heads and the #3 explorers right away because of H_20 spots and rust. Instruments need to be completely dry before packaging for sterilization. Do not leave the instruments in Vitaphene overnight, but you can air dry them overnight. The soap, brush and reusable rubber gloves are under the sink. A red bucket is provided to store the brush, used gloves and other contaminated materials.
- Put away all containers, gloves, etc.
- Wipe down the chairs with 409, clean the sink with Soft Scrub, and use Vitaphene the counter tops.
- Put the dental logs and daily appointment schedule into their folders.

6.7.3 Miscellaneous Weekly Tasks

- Clean the inside of the Chemiclave with metal cleaner and plastic scrub sponge and then wipe out with Vaposterile. There is a Handiwipe for the Vaposterile in the handle of the bottle. It is recommended that you warm the Chemiclave for 2 minutes with the door closed before cleaning. Clean the outside with Chemiclave polish. The cleaner, polish and scrub sponge are under the sink. Drain the reservoir and fill with Vaposterile.
- Double bag the biohazardous waste and replace with a clean bag. Check with the lab on the bags and dates of pickup.

- Dust, clean, etc., any counter tops (e.g., under the Chemiclave), computer, screen walls, shelves, etc., that need it. The bottle/instrument brush can be soaked in the Cidex jar.

6.7.4 Miscellaneous Tasks - Every Two Weeks

- Change the Cidex in the jar in the compressor. The Cidex is under the sink. The activator should be divided into fifths. Add Cidex solution (1/5 activator to 3 cups of the solution) to the jar.

6.7.5 Miscellaneous Monthly Tasks

- Check the Chemiclave with the spore test strips. They are kept in the freezer in the lab. Place the two strips in the blue packages in with a normal load of instruments and sterilize as usual. Return these strips to the envelope. Fill out the envelope and mail to MDT. Use Westat's address; Cathy Novak is the contact person; you are the technician.

6.7.6 End-of-Stand Pack-Up

- Inventory the dental room and belly compartment. The MEC Manager will have the inventory sheets. An inventory worksheet developed for the dental component is available to assist and track the stand inventories.

- Empty, rinse, and dry Cidex jar and lid.

- Clean Chemiclave and empty reservoir. Place in its case (which is in the belly compartment) along with its cup, tube, fork, cleaner and polish samples, etc., (which are in the plastic bowl in the cabinet).

- Place all forms in the bottom two drawers along with all pens, pencils, clips, etc.

- All stack shelves go into the cabinet.

- All bottles go under the sink.

- Gloves, headrest covers (used as pillow cases), paper towels, Kleenex, Chemiclave bags, tray liner, hot pad mitt, plastic containers, etc., can remain in the cabinet. Items should be moved to the bottom shelves to prevent movement during travel. Anything that is not too heavy, not too small, or easily spilled can be left in the cabinet. Containers with the gauze do not need to be emptied. Put the lids on all containers.

- Instruments should be packaged, sterilized, and placed in the top drawer. The lids do not need to be used on these containers.

- Pens, pencils, clips, tape, cords, etc., go into the last two drawers. Rubber band pencils and pens if they are loose. Clips, etc., can go into containers or Ziplock bags.

- Pack the cabinets and drawers in such a way that there will be a minimum amount of movement. Especially pack the bottles in the lower cabinet; add the wastebasket to prevent movement and spilling.

- Chemiclaves, Chemipurge and lights go into their cases from the belly compartment. Compressors go into boxes. The extra compressor is already boxed in the belly compartment.

- Tongue blades, curettes, polyform boxes, slides, gauze, sharpening stone, etc., can remain in the 2nd drawer.

- Everything is brought up from the belly compartment except the dental chair and the home health tech supplies that share the compartment. Arrange all boxes and chairs in such a way that it creates a wedge, preventing movement. You may need to repack the boxes with the extra supplies.

- The keyboard can remain fastened with Velcro to its sliding shelf under the computer. Make sure it is pushed in all the way so it catches the lock. Unplug the computer.

- Lock all cabinet drawers. There is a vertical bar lock on the inside of the upper left cabinet door that needs to be in the lock position. There is a Velcro strip int he third drawer that is to be looped through the upper cabinet handles. If the strip is not available, tape can be used. The MEC Manager will have the keys.

- Detach Chemipurge units from the Chemiclave and pack into case.

- Fold curtain neatly so it is not too wrinkled for the next stand. Place curtain in the cabinet but leave the rod in the doorway.

- Items that remain in the dental exam room during transport should be arranged carefully to prevent movement or breakage. A suggested arrangement of items is shown in Exhibit 6-9, Dental Exam Room Packup.

6.7.7 Shipping - End of Stand

- Send candidiasis slides and forms as usual.

- Put all logs, etc., in order.

- Original candidiasis transmittals should have been sent directly to the NHANES III Receipt and Control at NCHS. Copies of these logs should be shipped to Westat.

- The original referral forms/letters should already have been sent to NHANES III Receipt and Control at NCHS. At this time send the original referral log directly to NCHS Receipt and Control. A copy of the referral letters, and referral log should be shipped to Westat.

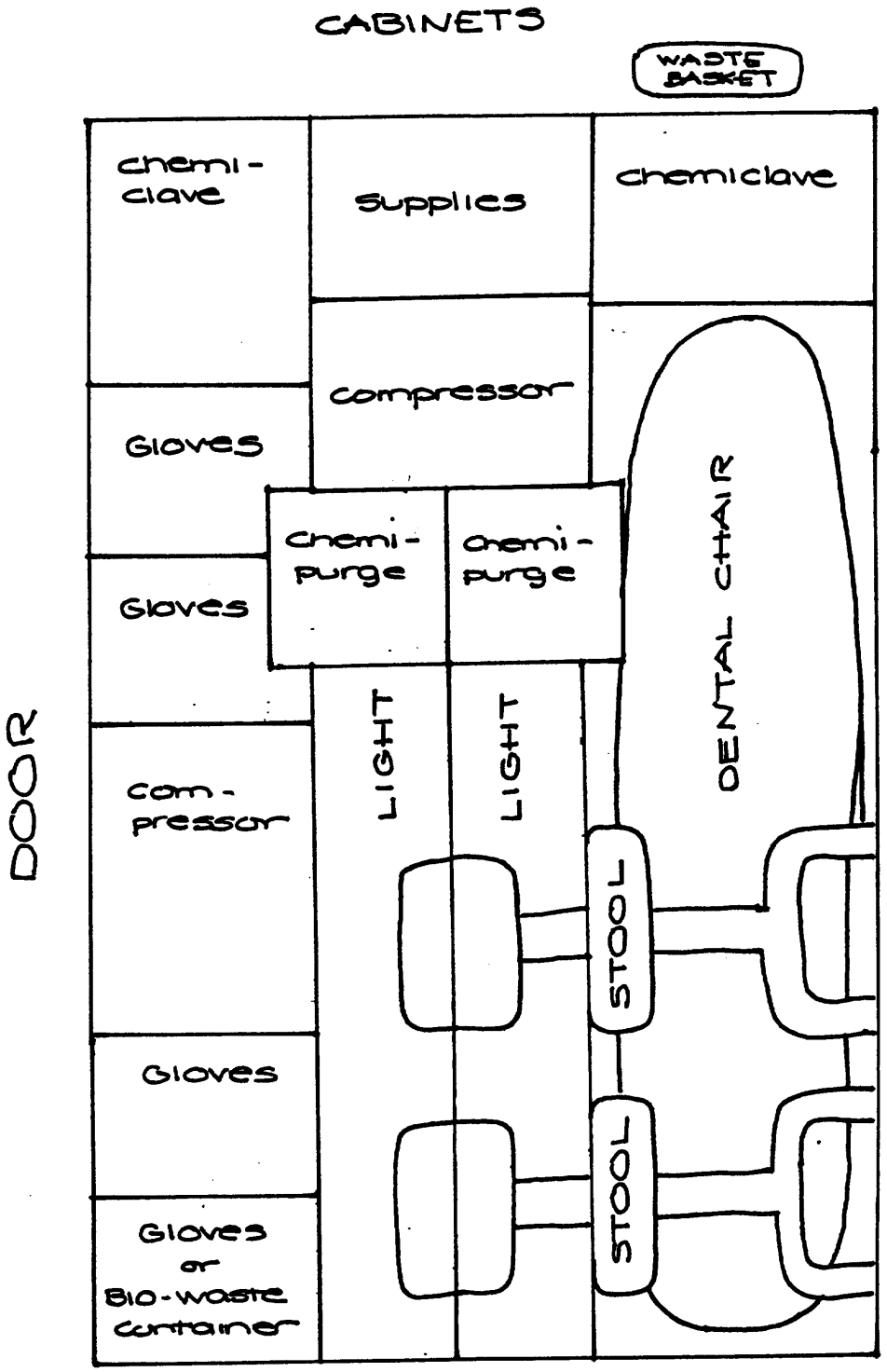
- The original dental logs should now be shipped to Westat.

- When the computer is down, you will need to use the hard copy forms. If it is not possible to enter these forms into the computer during the stand, notify Westat and NCHS and take the forms with you to the next stand. Enter them in the computer and complete the shipping procedure. Mark on each form when it was entered and any other pertinent information. These hard copy forms need to be shipped to NCHS at this time.

- Each hard copy form (Form 1 - green, Form 2 - blue, and Form 3 - red) will need a transmittal sheet. (See Attachment B.) Fill out the form and circle the numbers corresponding to each SP number. For example, SP # 108201 3, use the numbers in the underscored position. Check for these forms in the yellow folder; if more are needed the techs or the MEC Manager will know where the transmittal forms are located. This is a 3-part form. The white copy stays with the dental hard copies; the pink copy goes to NCHS; the yellow copy goes to Cathy Novak at Westat.

- The Record of Data Transmittal accompanies all shipping. Two of these white forms must be completed -- 1 for Westat and 1 for NCHS. Fill out each form and list all items that are being shipped to that destination. The MEC managers will have separate boxes for NCHS and Westat; make sure the forms are packed into the correct boxes.

Exhibit 6-9. Dental exam room packup



- Instruments or supplies that are broken, defective, or no longer used can be shipped back to the NHANES Warehouse Manager at Westat. Often they can be included in the Westat box with the forms. Place the instruments in an envelope and label with Warehouse Manager's name or ask the MEC Manager to ship directly to the warehouse.

Ship to Westat

- Original dental logs,
- Copies of the referral log and letters,
- Copies of the candidiasis logs,
- Yellow copies of the transmittal forms, and
- Record of Data Transmittal.

Ship to NCHS

- White copies of the transmittal forms,
- Dental hard copy forms, pages 1 (green), 2 (blue), and 3 (red) with their accompanying pink copy of the transmittal forms, and
- Record of Data Transmittal, and
- Pink copies of Recommendations for Dental Care forms with the pink copy of the completed Transmittal Form.

7. QUALITY CONTROL PROCEDURES

Two primary concerns in all epidemiological surveys are to protect the survey from errors that may compromise the representativeness of the sample, and errors in measurement of the phenomena being studied. Dental teams and support staff in NHANES III are responsible for protecting the accuracy and precision of the dental component of this survey by promoting maximum response rates and assuring the quality of data collected from the sample.

This section of the manual presents a brief summary of quality control procedures for which the dental team and support staff will be accountable.

7.1 Response Rates

The precision of the sample design in this survey is based on a very small number of persons selected to represent very large numbers of people. Therefore, the examination team's responsibility to achieve the maximum possible examination response rate is a very important one. The examination response rate is actually a product of response rates achieved at three stages: (1) the screener response rate, (2) the interview response rate, and (3) the examination response rate.

Obviously, the dental team is directly involved in only the third stage of developing high examination response rates. Appearance, demeanor, and attitude of professional personnel shape SPs' feelings about the survey and help determine the degree to which they will be cooperative during the examination. SPs' feelings toward project personnel also affect what they say about the survey after they leave the MEC and interact with other people in the community. Individual members of the dental team and support staff are to treat all SP's with respect and courtesy. Special attention must be devoted toward relieving fear in children and apprehensive adults. In addition to being pleasant and displaying a caring attitude toward the SP's, examiners must exercise great care in performing the assessments so that the SP's are comfortable during the examination.

Although it is only the third stage of response rate development in which the dental team is directly involved, every effort should be made to cooperate with advance arrangement teams and interview

teams to assist them in developing high response rates. Examiners must be willing to provide them with information and advice on how to alleviate fear that the examination may be painful or embarrassing so they can deal with apprehension among SP's who are reluctant to make an appointment for examination.

7.2 Data Quality

Each individual staff member is the first and best guarantor of the quality of the data being collected. Data quality is affected by every step of the survey including non-exam procedures leading to the examination, and non-exam procedures following the examination. The quality of data in this survey is controlled by (1) an intense training period for the dental teams with calibration of dental examiners prior to the beginning of the survey, (2) periodic monitoring and recalibration of dental examiners, and (3) periodic retraining of dental teams.

7.2.1 Training and Calibration

Training is divided into three phases as follows:

1. An instructional phase in which examination team members are familiarized with research examination procedures and criteria for research assessments.

2. A standardization phase in which they are trained to use standard procedures and apply standard criteria for the oral health assessments.

3. A calibration phase in which the degree of correlation among the examiners and the standard examiner is measured.

Instruction. The instructional phase of the training sequence is conducted by research scientists from NIDR with support and assistance from Gene Ley, the standard examiner. NIDR research scientists present lectures on criteria for each of the oral health assessments to be used in the survey. Lectures are accompanied by slide series depicting a wide variety of possible observations and illustrating application of assessment criteria to those observations. The lecture-slide presentations on each assessment are followed by instructions on data recording and editing for that assessment. Although the instructional

phase consists primarily of lectures and slide presentations, some demonstrations of examination technique and equipment use are conducted.

Standardization. The second phase of training is devoted to standardization. During this phase of training, the standard examiner reviews examination procedures and techniques and the criteria for each assessment, stressing the importance of consistency and uniformity among all examiners and the standard examiner in performing the examination and in applying the criteria to observations. Rationale for differences between a research examination and a diagnostic examination are discussed, and professional ethics of research examinations reviewed. A demonstration of the examination by the standard examiner and practice examinations by the examiners being trained are among the salient features of this phase. Standardization of all examiners is achieved by using replicate examinations with detailed discussion of observations. NIDR scientists, project consultants, and the standard examiner monitor and referee examinations and discussion of observations during these sessions.

Calibration. The reliability of the assessments is measured by determining the degree to which examiners can produce uniform and consistent results when performing independent replicate examinations without discussion. In this phase of training, the standard examiner and all examiners in training perform the entire examination on a specified number of SP's while NIDR examiners monitor the calibration session without discussing observations with any of the examiners or the standard examiner. Data from the calibration sessions are analyzed by NIDR computer programs to measure correlation between each examiner and the standard examiner. If correlations between each of the examiners and the standard examiner are not within acceptable ranges, additional training sessions will be scheduled.

7.2.2 Monitoring and Recalibration

Continual gathering of clean, reliable data in a consistent and uniform manner is the primary objective of the survey. Several quality control procedures will be carried out periodically to assure continuing quality of data gathered by the dental teams throughout the duration of the survey.

Complete Replicates. Intraexaminer reliability will be monitored by scheduling 20 SP's per MEC stand to come back for a second complete examination. Data from the first examination will be

compared to data from the second examination to determine the level of uniformity over time for each examiner. If data show that an examiner is not remaining within acceptable limits of uniformity and consistency in performing the dental assessments, he/she will be retrained prior to the regularly scheduled retraining session.

Expert Replication and Monitoring Field Operations. During the field operations, examiners and recorders should periodically review their Training Manuals to prevent deviation, "drift", from the standards achieved during the training period. Particular attention should be devoted to uniform adherence to the criteria for making correct decisions about observations. Strict compliance with infection control procedures is another important consideration for dental teams. In order to help the dental teams maintain their standards, NIDR scientists and various other project personnel will make periodic visits to field personnel to observe their performance and offer feedback on the results of their examinations.

The standard examiner, Dr. Gene Ley, will visit each team twice per year to observe field operations and to replicate 20 to 25 dental examinations during each visit. The purpose of these so called "expert replications" is to determine whether the examiners are maintaining the examination standards achieved during training, and to measure the degree of deviation, if any, from those standards. If correlation between the standard examiner and the field examiner is not within acceptable limits, retraining will be conducted on site.

Annual Retraining. The long duration of the study (6 years) mandates the need for regularly scheduled retraining periods. In addition to the regularly scheduled recalibration sessions with the standard examiner, there will be an annual retraining session for each dental examiner, also conducted by the standard examiner, Gene Ley.

APPENDIX A

RECOMMENDED INFECTION-CONTROL PRACTICES FOR DENISTRY

Reprinted by the
U S DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
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Recommended Infection-Control Practices for Dentistry

Dental personnel may be exposed to a wide variety of microorganisms in the blood and saliva of patients they treat in the dental operatory. These include *Mycobacterium tuberculosis*, hepatitis B virus, staphylococci, streptococci, cytomegalovirus, herpes simplex virus types I and II, human T-lymphotropic virus type III/lymphadenopathy-associated virus (HTLV-III/LAV), and a number of viruses that infect the upper respiratory tract. Infections may be transmitted in dental practice by blood or saliva through direct contact, droplets, or aerosols. Although not documented, indirect contact transmission of infection by contaminated instruments is possible. Patients and dental health-care workers (DHCWs) have the potential of transmitting infections to each other (*1*).

A common set of infection-control strategies should be effective for preventing hepatitis B, acquired immunodeficiency syndrome, and other infectious diseases caused by bloodborne viruses (*2-4*). The ability of hepatitis B virus to survive in the environment (*5*) and the high titers of virus in blood (*6*) make this virus a good model for infection-control practices to prevent transmission of a large number of other infectious agents by blood or saliva. Because all infected patients cannot be identified by history, physical examination, or readily available laboratory tests (*3*), the following recommendations should be used routinely in the care of all patients in dental practices.

MEDICAL HISTORY

Always obtain a thorough medical history. Include specific questions about medications, current illnesses, hepatitis, recurrent illnesses, unintentional weight loss, lymphadenopathy, oral soft tissue lesions, or other infections. Medical consultation may be indicated when a history of active infection or systemic disease is elicited.

USE OF PROTECTIVE ATTIRE AND BARRIER TECHNIQUES

1. For protection of personnel and patients, gloves must always be worn when touching blood, saliva, or mucous membranes (*7-10*). Gloves must be worn by DHCWs when touching blood-soiled items, body fluids, or secretions, as well as surfaces contaminated with them. Gloves must be worn when examining all oral lesions. All work must be completed on one patient, where possible, and the hands must be washed and regloved before performing procedures on another patient. Repeated use of a single pair of gloves is not recommended, since such use is likely to produce defects in the glove material, which will diminish its value as an effective barrier.

2. Surgical masks and protective eyewear or chin-length plastic face shields must be worn when splashing or spattering of blood or other body fluids is likely, as is common in dentistry (*11,12*).

3. Reusable or disposable gowns, laboratory coats, or uniforms must be worn when clothing is likely to be soiled with blood or other body fluids. If reusable gowns are worn, they may be washed, using a normal laundry cycle. Gowns should be changed at least daily or when visibly soiled with blood (*13*).

4. Impervious-backed paper, aluminum foil, or clear plastic wrap may be used to cover surfaces (e.g., light handles or x-ray unit heads) that may be contaminated by blood or saliva and that are difficult or impossible to disinfect. The coverings should be removed (while DHCWs are gloved), discarded, and then replaced (after ungloving) with clean material between patients.

5. All procedures and manipulations of potentially infective materials should be performed carefully to minimize the formation of droplets, spatters, and aerosols, where possible. Use of rubber dams, where appropriate, high-speed evacuation, and proper patient positioning should facilitate this process.

HANDWASHING AND CARE OF HANDS

Hands must always be washed between patient treatment contacts (following removal of gloves), after touching inanimate objects likely to be contaminated by blood or saliva from other patients, and before leaving the operatory. The rationale for handwashing after gloves have been worn is that gloves become perforated, knowingly or unknowingly, during use and allow bacteria to enter beneath the glove material and multiply rapidly. For many routine dental procedures, such as examinations and nonsurgical techniques, handwashing with plain soap appears to be adequate, since soap and water will remove transient microorganisms acquired directly or indirectly from patient contact (*13*). For surgical procedures, an antimicrobial surgical handscrub should be used (*14*). Extraordinary care must be used to avoid hand injuries during procedures. However, when gloves are torn, cut, or punctured, they must be removed immediately, hands thoroughly washed, and regloving accomplished before completion of the dental procedure. DHCWs who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling dental patient-care equipment until the condition resolves (*15*).

USE AND CARE OF SHARP INSTRUMENTS AND NEEDLES

1. Sharp items (needles, scalpel blades, and other sharp instruments) should be considered as potentially infective and must be handled with extraordinary care to prevent unintentional injuries.

2. Disposable syringes and needles, scalpel blades, and other sharp items must be placed into puncture-resistant containers located as close as practical to the area in which they were used. To prevent needlestick injuries, disposable needles should not be recapped, purposefully bent or broken, removed from disposable syringes, or otherwise manipulated by hand after use.

3. Recapping of a needle increases the risk of unintentional needlestick injury. There is no evidence to suggest that reusable aspirating-type syringes used in dentistry should be handled differently from other syringes. Needles of these devices should not be recapped, bent, or broken before disposal.

4. Because certain dental procedures on an individual patient may require multiple injections of anesthetic or other medications from a single syringe, it would be more prudent to place the unsheathed needle into a "sterile field" between injections rather than to recap the needle between injections. A new (sterile) syringe and a fresh solution should be used for each patient.

INDICATIONS FOR HIGH-LEVEL DISINFECTION OR STERILIZATION OF INSTRUMENTS

Surgical and other instruments that normally penetrate soft tissue and or bone (e.g., forceps, scalpels, bone chisels, scalers, and surgical burs) should be sterilized after each use. Instruments that are not intended to penetrate oral soft tissues or bone (e.g., amalgam condensers, plastic instruments, and burs) but that may come into contact with oral tissues should also be sterilized after each use, if possible; however, if sterilization is not feasible, the latter instruments should receive high-level disinfection (*3, 13, 16*).

METHODS FOR HIGH-LEVEL DISINFECTION OR STERILIZATION

Before high-level disinfection or sterilization, instruments should be cleaned to remove debris. Cleaning may be accomplished by a thorough scrubbing with soap and water or a detergent, or by using a mechanical device (e.g., an ultrasonic cleaner). Persons involved in cleaning and decontaminating instruments should wear heavy-duty rubber gloves to prevent hand injuries. Metal and heat-stable dental instruments should be routinely sterilized between use by steam under pressure (autoclaving), dry heat, or chemical vapor. The adequacy of sterilization cycles should be verified by the periodic use of spore-testing devices (e.g., weekly for most dental practices) (*13*). Heat- and steam-sensitive chemical indicators may be used on the outside of each pack to assure it has been exposed to a sterilizing cycle. Heat-sensitive instruments may require up to 10 hours' exposure in a liquid chemical agent registered by the U.S. Environmental Protection Agency (EPA) as a disinfectant/sterilant; this should be followed by rinsing with sterile water. High-level disinfection may be accomplished by immersion in either boiling water for at least 10 minutes or an EPA-registered disinfectant/sterilant chemical for the exposure time recommended by the chemical's manufacturer.

DECONTAMINATION OF ENVIRONMENTAL SURFACES

At the completion of work activities, countertops and surfaces that may have become contaminated with blood or saliva should be wiped with absorbent toweling to remove extraneous organic material, then disinfected with a suitable chemical germicide. A solution of sodium hypochlorite (household bleach) prepared fresh daily is an inexpensive and very effective germicide. Concentrations ranging from 5,000 ppm (a 1:10 dilution of household bleach) to 500 ppm (a 1:100 dilution) sodium hypochlorite are effective, depending on the amount of organic material (e.g., blood, mucus, etc.) present on the surface to be cleaned and disinfected. Caution should be exercised, since sodium hypochlorite is corrosive to metals, especially aluminum.

DECONTAMINATION OF LABORATORY SUPPLIES AND MATERIALS

Blood and saliva should be thoroughly and carefully cleaned from laboratory supplies and materials that have been used in the mouth (e.g., impression materials, bite registration), especially before polishing and grinding intra-oral devices. Materials, impressions, and intra-oral appliances should be cleaned and disinfected before being handled, adjusted, or sent to a dental laboratory (*17*). These items should also be cleaned and disinfected when returned from the dental laboratory and before placement in the patient's mouth. *Because of the ever-increasing variety of dental materials used intra-orally, DHCWs are advised to consult with manufacturers as to the stability of specific materials relative to disinfection procedures.* A chemical germicide that is registered with the EPA as a "hospital disinfectant" and that has a label claim for mycobactericidal (e.g., tuberculocidal) activity is preferred, because mycobacteria represent one of the most resistant groups of microorganisms; therefore, germicides that are effective against mycobacteria are also effective against other bacterial and viral pathogens (*15*). Communication between a dental office and a dental laboratory with regard to handling and decontamination of supplies and materials is of the utmost importance.

USE AND CARE OF ULTRASONIC SCALERS, HANDPIECES, AND DENTAL UNITS

1. Routine sterilization of handpieces between patients is desirable; however, not all handpieces can be sterilized. The present physical configurations of most handpieces do not readily lend them to high-level disinfection of both external and internal surfaces (see 2 below); therefore, when using handpieces that cannot be sterilized, the following cleaning and disinfection procedures should be completed between each patient: After use, the handpiece should be flushed (see 2 below), then thoroughly scrubbed with a detergent and water to remove adherent material. It should then be thoroughly wiped with absorbent material saturated with a chemical germicide that is registered with the EPA as a "hospital disinfectant" and is mycobactericidal at use-dilution (*15*). The disinfecting solution should remain in contact with the handpiece for a time specified by the disinfectant's manufacturer. Ultrasonic scalers and air/water syringes should be treated in a similar manner between patients. Following disinfection, any chemical residue should be removed by rinsing with sterile water.

2. Because water retraction valves within the dental units may aspirate infective materials back into the handpiece and water line, check valves should be installed to reduce the risk of transfer of infective material (*18*). While the magnitude of this risk is not known, it is prudent for water-cooled handpieces to be run and to discharge water into a sink or container for 20-30 seconds after completing care on each patient. This is intended to physically flush out patient material that may have been aspirated into the handpiece or water line. Additionally, there is some evidence that overnight bacterial accumulation can be significantly reduced by allowing water-cooled handpieces to run and to discharge water into a sink or container for several minutes at the beginning of the clinic day (*19*). Sterile saline or sterile water should be used as a coolant/irrigator when performing surgical procedures involving the cutting of soft tissue or bone.

HANDLING OF BIOPSY SPECIMENS

In general, each specimen should be put in a sturdy container with a secure lid to prevent leaking during transport. Care should be taken when collecting specimens to avoid contamination of the outside of the container. If the outside of the container is visibly contaminated, it should be cleaned and disinfected, or placed in an impervious bag (*20*).

DISPOSAL OF WASTE MATERIALS

All sharp items (especially needles), tissues, or blood should be considered potentially infective and should be handled and disposed of with special precautions. Disposable needles, scalpels, or other sharp items should be placed intact into puncture-resistant containers before disposal. Blood, suctioned fluids, or other liquid waste may be carefully poured into a drain connected to a sanitary sewer system. Other solid waste contaminated with blood or other body fluids should be placed in sealed, sturdy impervious bags to prevent leakage of the contained items. Such contained solid wastes can then be disposed of according to requirements established by local or state environmental regulatory agencies and published recommendations (*13,20*).

Developed by Dental Disease Prevention Activity, Center for Prevention Svcs, Hospital Infections Program, Center for Infectious Diseases, CDC.

Editorial Note: All DHCWs must be made aware of sources and methods of transmission of infectious diseases. The above recommendations for infection control in dental practices incorporate procedures that should be effective in preventing the transmission of infectious agents from dental patients to DHCWs and vice versa. Assessment of quantifiable risks to dental personnel and patients for specific diseases requires further research. There is no current documentation of patient-to-patient blood- or saliva-borne disease transmission from procedures performed in dental practice. While few in number, reported outbreaks of dentist-to-patient transmission of hepatitis B have resulted in serious and even fatal consequences (*9*). Herpes simplex virus has been transmitted to over 20 patients from the fingers of a DHCW (*10*). Serologic markers for hepatitis B in dentists have increased dramatically in the United States over the past several years, which suggests current infection-control practices have been insufficient to prevent the transmission of this infectious agent in the dental operatory. While vaccination for hepatitis B is strongly recommended for dental personnel (*21*), vaccination alone is not cause for relaxation of strict adherence to accepted methods of asepsis, disinfection, and sterilization.

Various infection-control guidelines exist for hospitals and other clinical settings. Dental facilities located in hospitals and other institutional settings have generally utilized existing guidelines for institutional practice. These recommendations are offered as guidance to DHCWs in noninstitutional settings for enhancing infection-control practices in dentistry; they may be useful in institutional settings also.

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APPENDIX B

DENTAL TERMINOLOGY

DENTAL TERMS

- TEETH
  - ANTERIOR
    - Central Incisor
    - Lateral Incisor
    - Cuspid (Canine)
  - POSTERIOR
    - 1st Bicuspid (1st Premolar)
    - 2nd Bicuspid (2nd Premolar)
    - 1st Molar
    - 2nd Molar
    - 3rd Molar (Wisdom)
  - MAXILLARY (Upper)
  - MANDIBULAR (Lower)
  - CROWN (Coronal)
  - ROOT
- SURFACES
  - Occlusal
  - Lingual
  - Buccal (Labial or facial)
  - Mesial
  - Distal

PERIODONTIUM

- GINGIVA (GUMS)
- SULCUS (CUFF OR GROOVE)
- ENAMEL
- CEMENTUM
- CEJ (CEMENTO-ENAMEL JUNCTION)

D - DECAY CARIES CARIOUS

M - MISSSING

F - FILLED

S - SOUND

C - CROWN

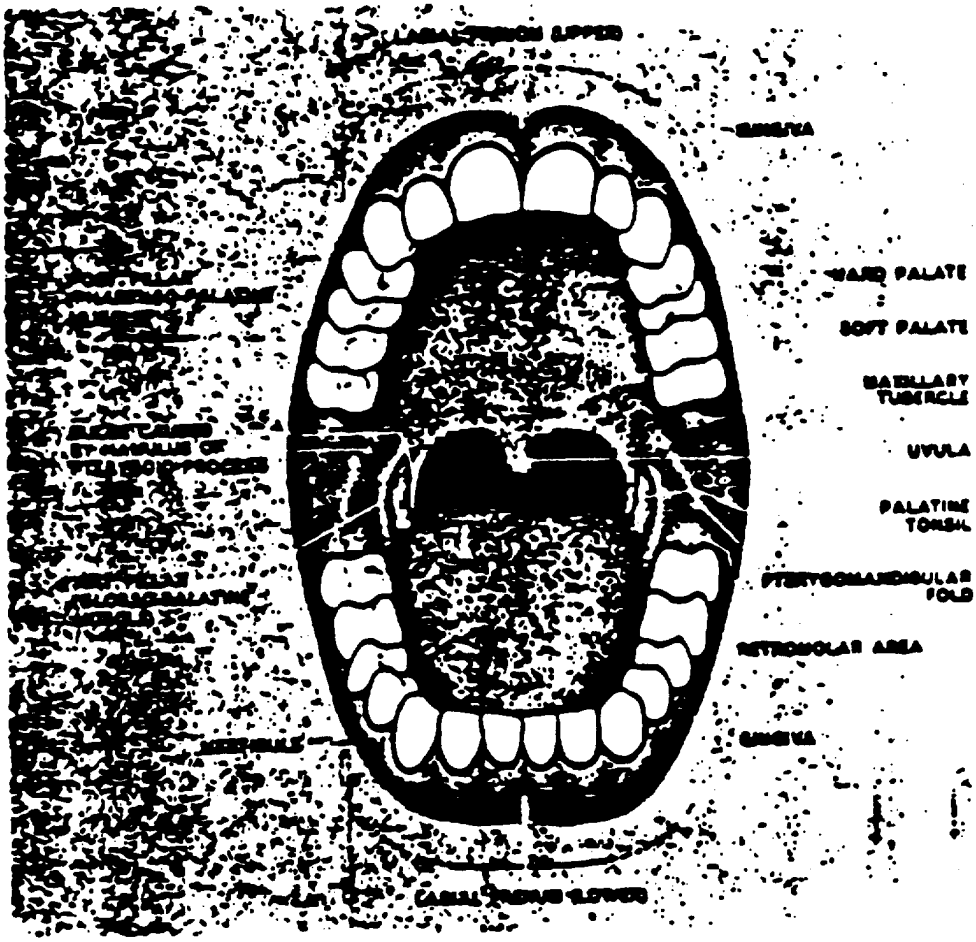
U - UNERUPTED

E - EXTRACTED

Y - (EXCLUDED)

R - ROOT

PSU - PRIMARY SAMPLING UNIT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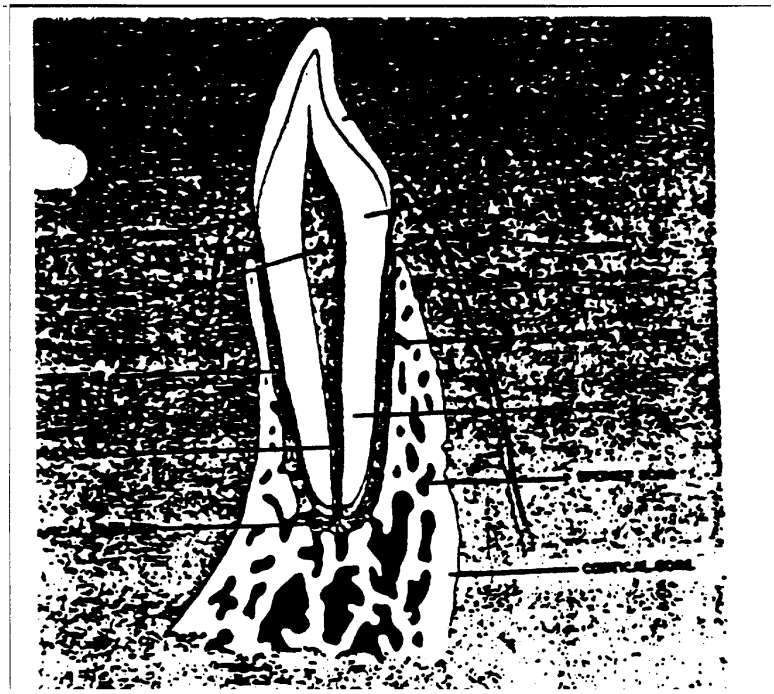
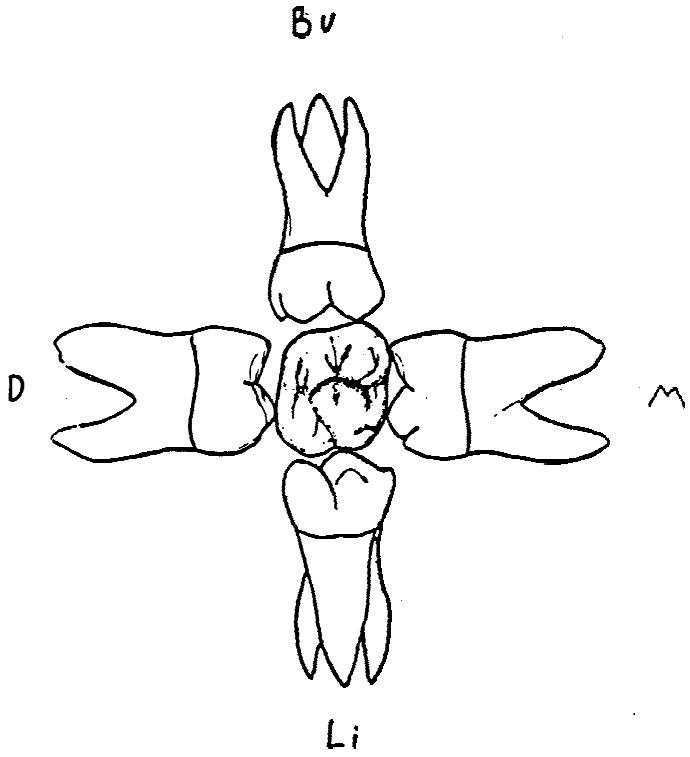
SOFT PALATE
MAXILLARY TUBERCLE
UVULA
PALATINE TONSIL
PTERYGOMANDIBULAR FOLD
RETROMOLAR AREA

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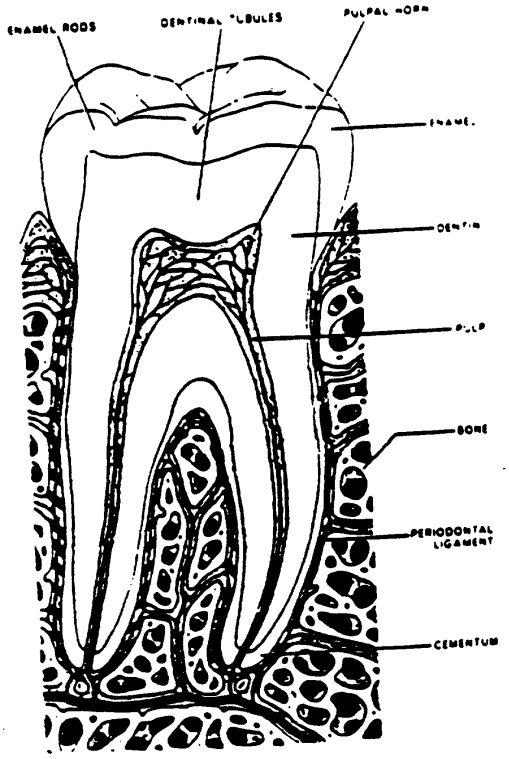
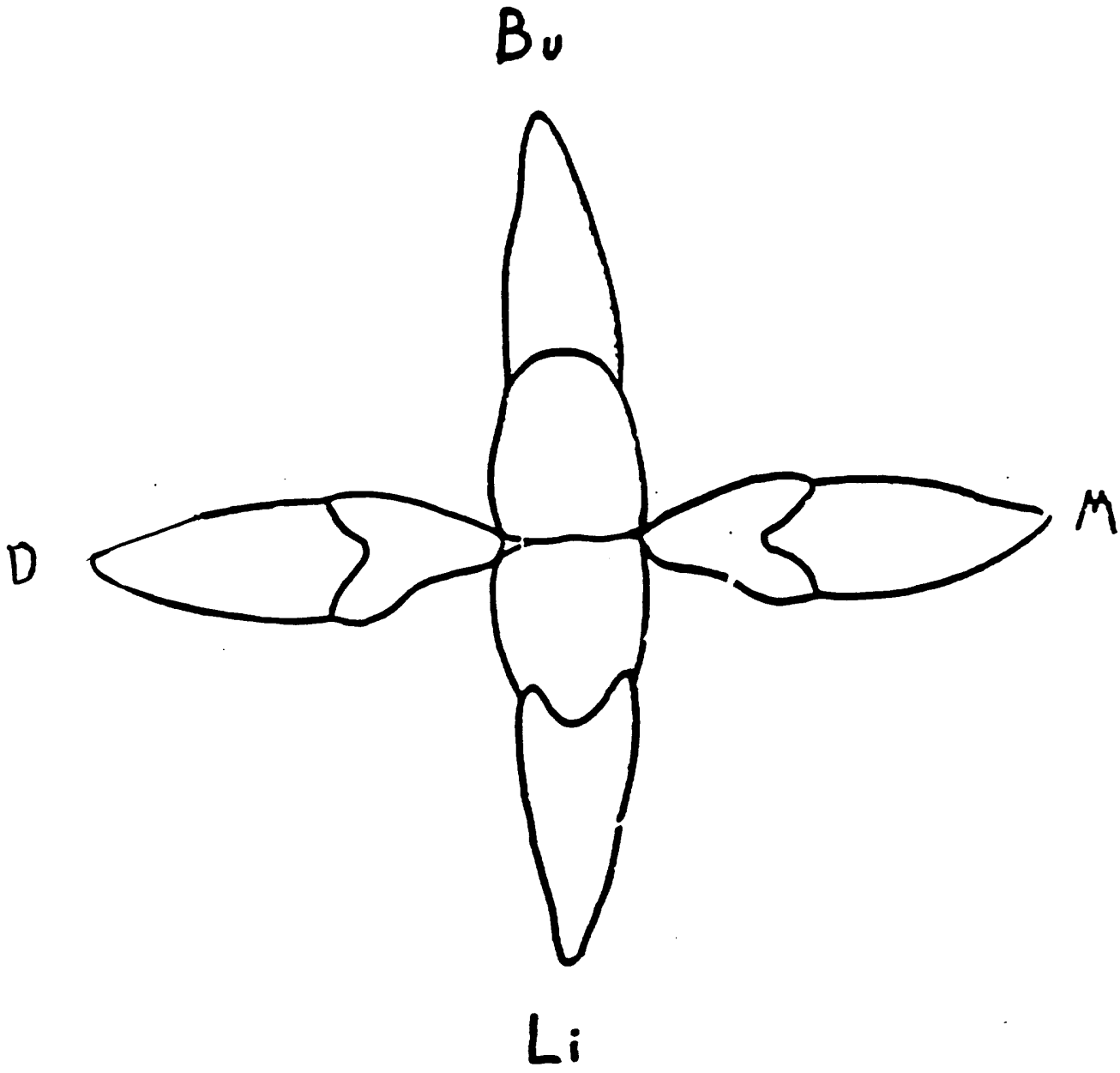

ENAMEL RODS
DENTINAL TUBULES
PULPAL HORN
ENAMEL
DENTIN
PULP
BONE
PERIODONTAL LIGAMENT
CEMENTUM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NHANES III ORAL HEALTH COMPONENT
RECORDER'S GUIDE
TO DIRECT DATA ENTRY

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Introduction

Data collection for the Dental Component is designed to permit the use of paper forms or direct computer input.

Computer input (direct data entry) will be the standard procedure; paper forms will be used in the event of computer failure.

Training for the recorders will begin with the paper forms. Transition to direct data entry should be achieved smoothly since the computer entry screens are designed to emulate the layout of the paper forms.

This document can be viewed as "chapter two" of the NHANES Dental Recorders Manual.

Data Collection - Computer and Paper

For the convenience of the recorder, the computer data entry was modeled as closely as possible after the paper forms systems. The few differences that exist were designed to make data entry easier and more accurate. These are summarized below:

1 - The examination components and their sequence are the same for both systems. During computer data entry, however, the proper sequence of components is automatically determined and displayed for each SP, based on such data as the SP's age or medical status.

2 - During computer data entry, the appropriate upper and lower quadrants of the mouth to receive the periodontal examination are automatically selected.

3 - Although the diagnostic codes are identical for both systems, the computer will check for certain types of entry errors before accepting data. If the information entered is not appropriate for a given field, the computer will beep as a signal that an error has occurred. The recorder and examiner can then review the call for accuracy and re-enter the data.

4 - As an aid to error checking, the computer notes which teeth are recorded as missing on the first examination component and keeps track of this information for the components that follow.

Conversely, if a call is made determining a tooth to be 'present' during the early components, that tooth can not be called as 'missing' in later components.

The following section of the manual describes:

1 - The different modes of data entry (ADD, MODIFY, and REVIEW),

2 - The use of the keyboard, including special keys that have been assigned specific functions for this program, and

3 - The use of menus within the data screens that allow the recorder to move around within the system.

Modes of Data Entry

Upon entering the system, you must choose between entering data for a new SP (ADD mode) or modifying data from an earlier examination (MODIFY mode). The difference between the two is that in ADD mode the data will be entered into blank data screens, whereas in MODIFY mode the data screens will already contain data from a previous examination, but may be modified as necessary.

The ADD mode will be used most frequently since it should rarely be necessary to modify an existing record. All keyboard and menu operations are identical for the two modes.

Whether entering data for a new SP or modifying an existing record, the sequence of the examination components determined by the computer can be overridden by the recorder by selecting the REVIEW function. At the top of each component screen, REVIEW appears as an option. Select it by pressing F2 from all ADD entry screens except for the initial SP Data/Medical Exclusions.

In the REVIEW function, the recorder can select any of the previously completed exam components for review and correction. After the review of a component is completed, the computer determined sequence will be resumed at the point where the recorder selected REVIEW from the header menu.

Moving Around (cont'd)
Modes of Data Entry

When in REVIEW, some key and menu operations are slightly different than in ADD or MODIFY modes. These differences are explained in the following section.

[One of the most important rules to remember is this:

advancing from field to field is dependent upon valid data being entered into each field. The data input system checks the information typed from the keyboard for certain logical errors before accepting it. For example, 'Age' can only be entered in numerals.

Whether in 'ADD' or 'MODIFY' mode, or in the 'REVIEW' function, the system will not let you advance beyond a field where invalid or inconsistent data has been entered.]

At the top right of the entry screen, the system displays one of the four following prompts:

Add-System, Add-Review, Modify-System, Modify-Review

Add - System indicates you are currently in ADD Mode and the sequence of components is determined by the system logic.

Add - Review indicates you are currently in ADD Mode and the sequence of components is determined by selecting the highlighted component in the Review Screen.

Modify - System indicates you are currently in MODIFY Mode and the sequence of components is determined by the system logic.

Modify - Review indicates you are currently in MODIFY Mode and the sequence of components is determined by selecting the highlighted component in the Review Screen.

There are three types of keys you will use to enter data and move about within the system. They are:

- Function Keys
- Data Keys
- Directional Keys

Function Keys

Function keys are the darker keys which run across the top of your keyboard. These keys perform specific 'program functions' when pressed. Examples are:

F1 - ADD, F2 - Modify, F10 - Quit Exam

Data Keys

Data keys are the alphabetic/numeric keys which make up the bulk of the keyboard. These are used to type actual information being entered into a field. Examples are:

Code	Description
'Y'	presence of a third molar,
'2'	recording mesial decay
'6'	tooth missing due to trauma

Directional Keys

Directional keys are used simply to move from field to field after valid data have been entered into each field. Examples are:

the up/down/right/left 'arrow' keys,

the 'ENTER' key

the Tab key

The following is an explanation of all function and directional keys.

Function Keys

Key	Function
F1	From first entry screen, invokes ADD mode. When in ADD mode, 'Completes' and saves the component.
F2	From the first entry screen, invokes MODIFY mode to make changes to an existing (previously completed) record. When in ADD mode, invokes REVIEW mode, to make changes to a sub-component for the current examination.
F4	In MODIFY mode, prints a copy of all the components for the currently selected SP. (All the components will print on three pages. See Appendix A)
F5	When in ADD mode, 'Aborts the Component'. The user is advanced to the next component, and the data entered into the incomplete component is saved.

Moving Around (cont'd)
Function and Directional Keys

F10	When in ADD mode, 'Quits the Exam' and saves all data. From the first entry screen, 'Exits to DOS'.
Shift/F10	When in ADD mode, 'Quits the Exam' but does not save any data entered for the SP.
ESC	The 'Escape' key "switches" the header menu on and off.
DELETE	Deletes the character at the cursor.
INSERT	Inserts a character at the cursor without overwriting the proceeding characters.
BACKSPACE	When pressed, moves backward from character to character while deleting.

Directional Keys

Key	Function
Up/Down Arrows	Within a component of multiple quadrants (Coronal Caries, Root Caries, Periodontal, etc.) moves cursor vertically from quadrant to quadrant.
Right/Left Arrows	Within a multiple variable 'call' field, moves the cursor from left to right. At the left-most position within a field, cursor goes to beginning of previous field, if at the rightmost position cursor goes to beginning of next field.
RETURN (ENTER)	From the REVIEW screen, selects the sub-component highlighted when pressed. Within a component advances the cursor through all fields containing valid data.
TAB	Within a component advances the cursor through all fields containing valid data.
Shift TAB	Within a component moves the cursor to the previous fields.

Header Menus

The system was designed to keep the entry screens as clear and simple to read as possible.

In keeping with this philosophy, the Menus appear at the top of the screen and they can be toggled (turned on and off). The key which toggles the Header Menu is the ESCAPE key.

There are two major menus and one instructional header. The commands available and a description of each appears below.

All 'menus' appear at the top of entry screens and display the valid entry functions for that screen.

The initial header menu appears as follows:

F1 - ADD F2 - MODIFY F10 - EXIT to DOS

The choices are:

ADD, MODIFY, EXIT TO DOS.

The second header menu is displayed once the ADD mode has been selected and appears as follows:

F1-COMPLETE F2-REVIEW F5-INCOMPLETE F10-ABORT EXAM ESCAPE

The choices are:

COMPLETE, REVIEW, ABORT COMPONENT, QUIT EXAM, ESCAPE.

The third instructional menu is displayed in REVIEW mode and appears as follows:

' ' PREVIOUS ' ' NEXT (Return) SELECT (Esc) CONTINUE

The choices are:

PREVIOUS, NEXT, SELECT, CONTINUE

The Component Structure

Each component of the Oral Health examination is recorded in a specific component entry screen. The following section contains an 'exhibit' for each of the entry screens. Some of the entry screens contain information for more than one component, while other screens are component specific.

The following is a listing of all components, broken down by the entry screen on which they appear. The entry screens are numbered sequentially, and that number appears at the top of the exhibit page for each screen.

Screen #1

Demographic/General Information

Medical Exclusions

Nursing Bottle Caries (pop-up window where applicable)

Screen #2

Soft Tissue Exam

a - Location
b - Clinical Diagnosis
c - Clinical Description

(c - appears as a pop-up window where applicable.)

Screen #3

Coronal Caries

Root Caries

Restoration and Condition

Traumatic Injuries

Occlusal Characteristics

The Component Structure (cont'd)

Screen #4

Gingival

Calculus

Loss of Attachment

Furcations

Screen #5

Prostheses Assessment

Denture Questionnaire

Screen #6

Exit Screen

a - Smear Verification (pop-up window where applicable)

With the exception of Occlusal Characteristics and the Denture Questionnaire, the different components are separated by double lines. A general rule to remember is:

- single, closed lines separate fields or sections within a component,

and

- double, closed lines separate components from components.

Special Screens

There are two entry screens which differ from the above six screens. They are the 'Review' and 'Modify' screens.

Screen #7 - Review

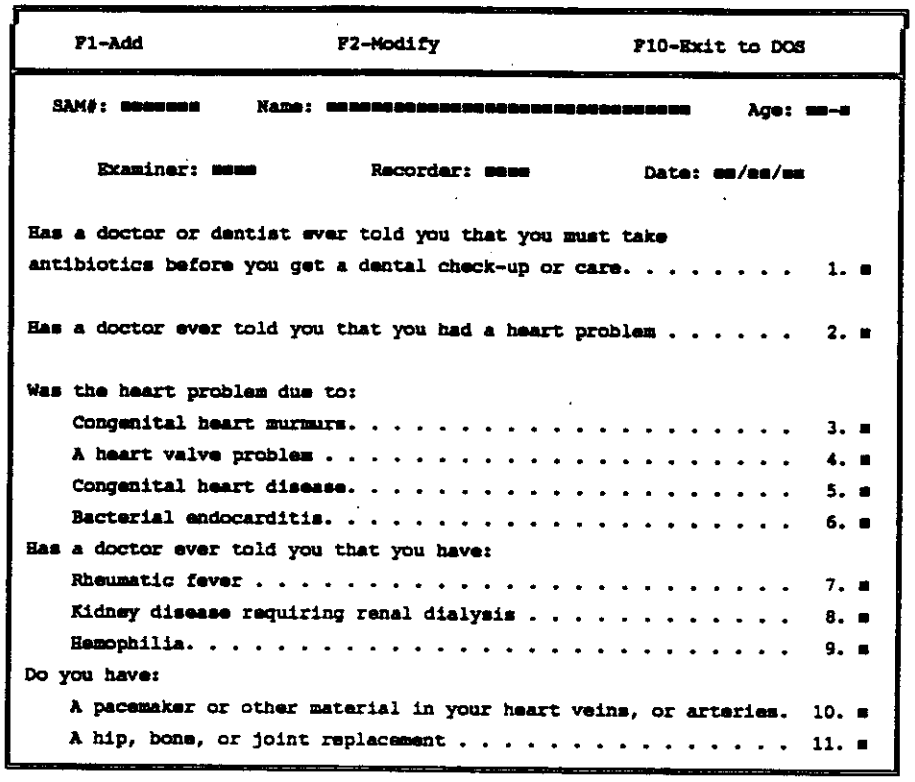
This screen is displayed when 'Review' is selected at any point during an examination. It allows the recorder to make changes to previously completed (or incompleted) components within an examination.

Screen #8 - Modify

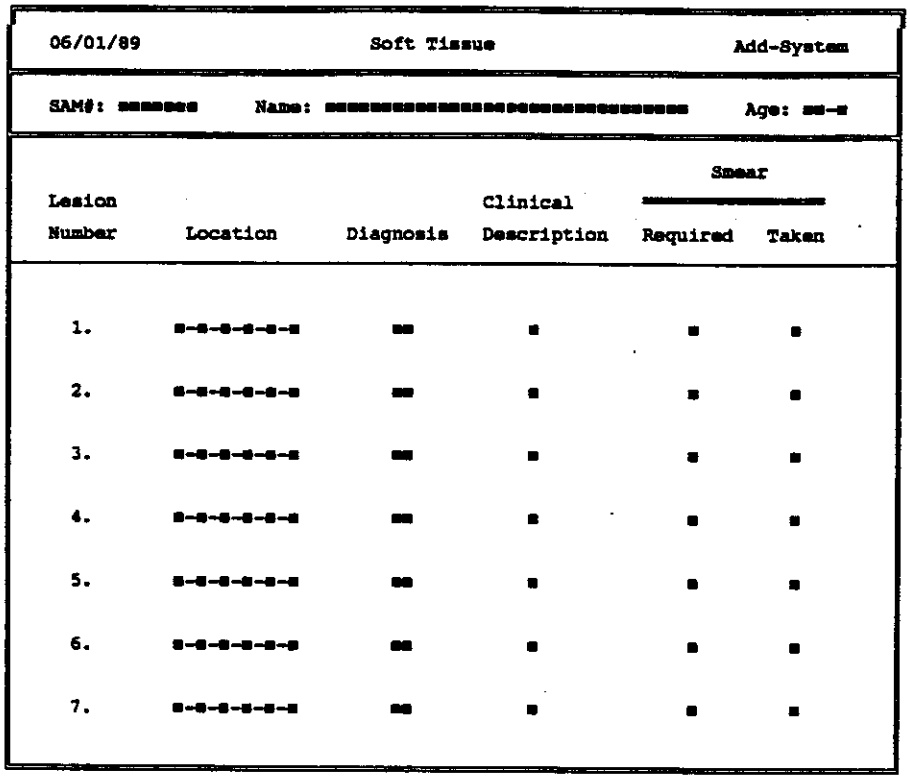
This screen is displayed when 'Modify is selected from the initial header menu. It allows the recorder to make changes to a previously completed SP record.

Remember that the system will be performing error checks on the data as you enter it into the system. If the data you attempt to enter is invalid or contradictory the system will 'beep' and wait for you to re-enter valid data.

Component Structure
Screen #1

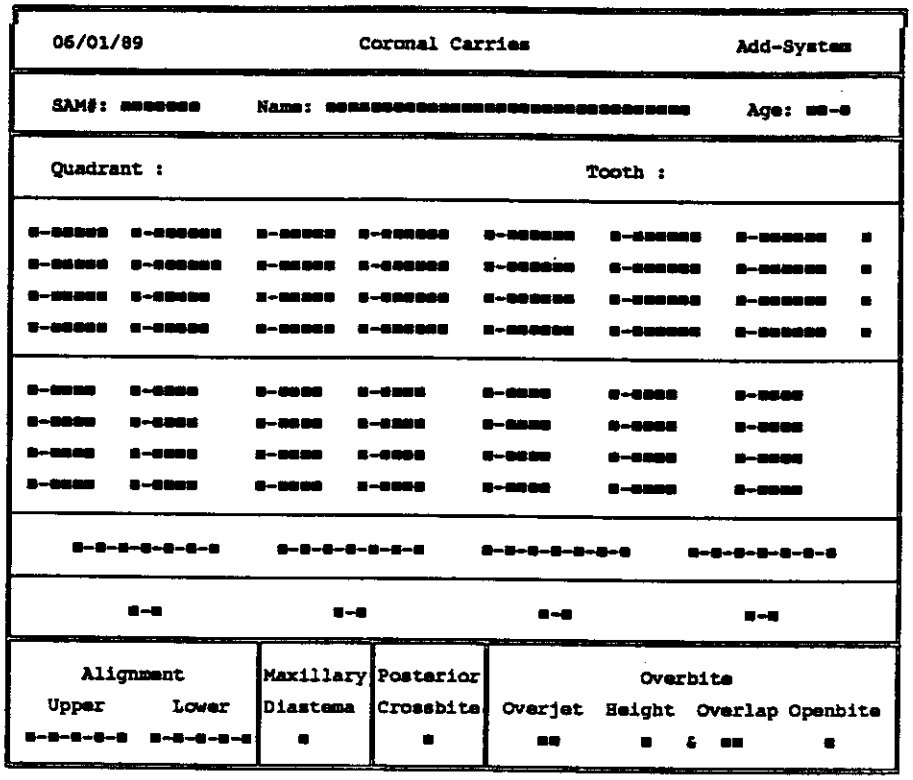


Component Structure
Screen #2

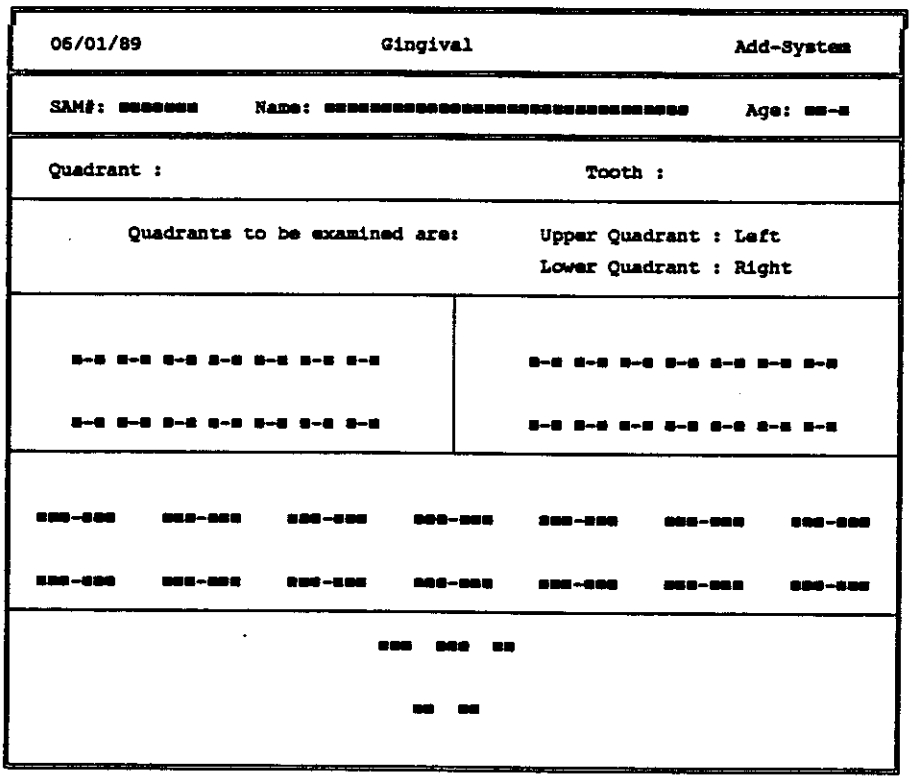


06/01/89		Soft Tissue			Add-System
SAM#: ■■■■■■■		Name: ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■			Age: ■■-■
Lesion Number	Location	Diagnosis	Clinical Description	Smear Required	Smear Taken
1.	■-■-■-■-■-■	■■	■	■	■
2.	■-■-■-■-■-■	■■	■	■	■
3.	■-■-■-■-■-■	■■	■	■	■
4.	■-■-■-■-■-■	■■	■	■	■
5.	■-■-■-■-■-■	■■	■	■	■
6.	■-■-■-■-■-■	■■	■	■	■
7.	■-■-■-■-■-■	■■	■	■	■

Component Structure
Screen #3



Component Structure
Screen #4



Component Structure
Screen #5

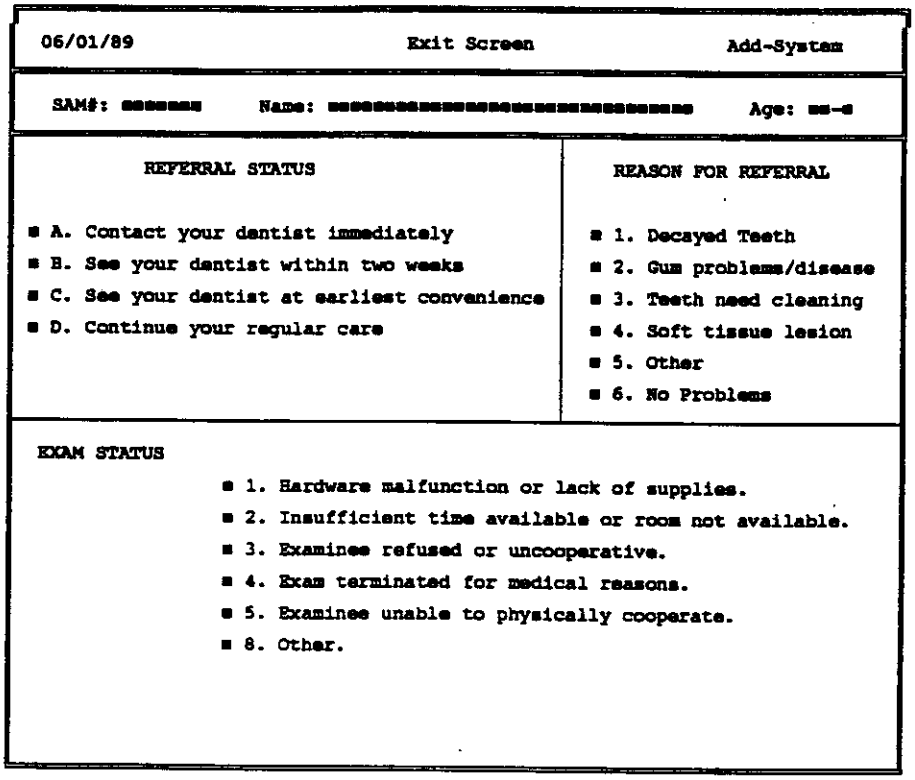
06/01/89	Prostheses Assessment	Add-System
SAM#: ■■■■■■■	Name: ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■	Age: ■■-■

PROSTHESES ASSESSMENT

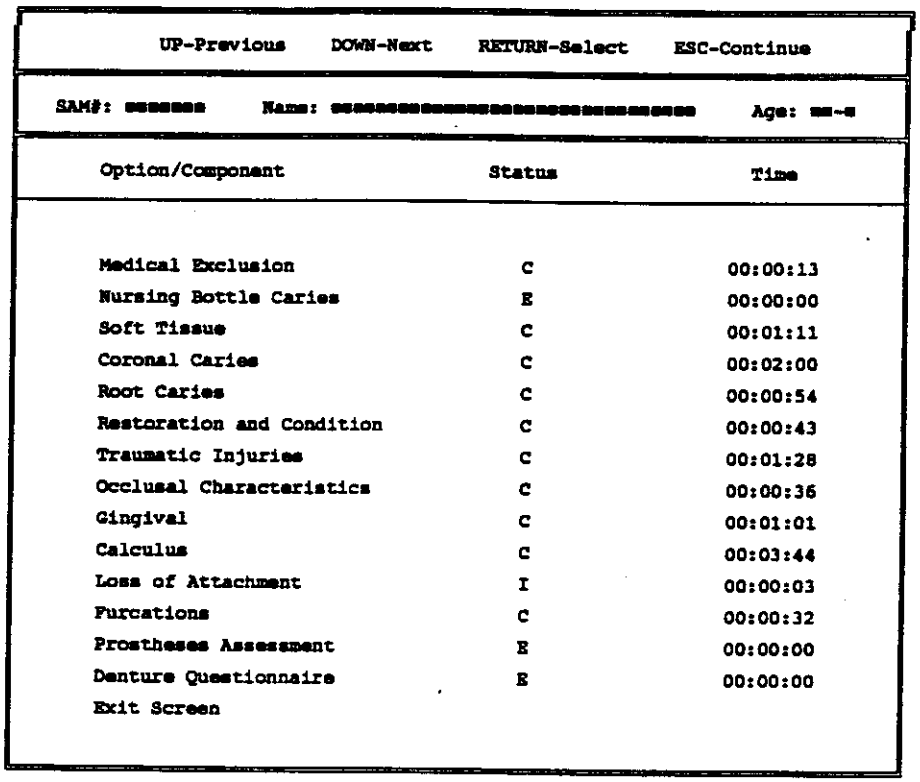
Upper ■-■■■■■ Lower ■-■■■■■

DENTURE QUESTIONNAIRE	Upper Arch	Lower Arch
Do you usually wear your (upper/lower) denture (plate)?	■	■
During the past year, have you had problems with your denture(s) (plate)?	■	■
Do you think that you need (a) new denture(s) (plate) or that the one you have needs refitting?	■	■
How long has it been since you had any natural teeth to chew with in your (upper/lower) jaw?	■	■

Component Structure
Screen #6



Component Structure
Screen #7

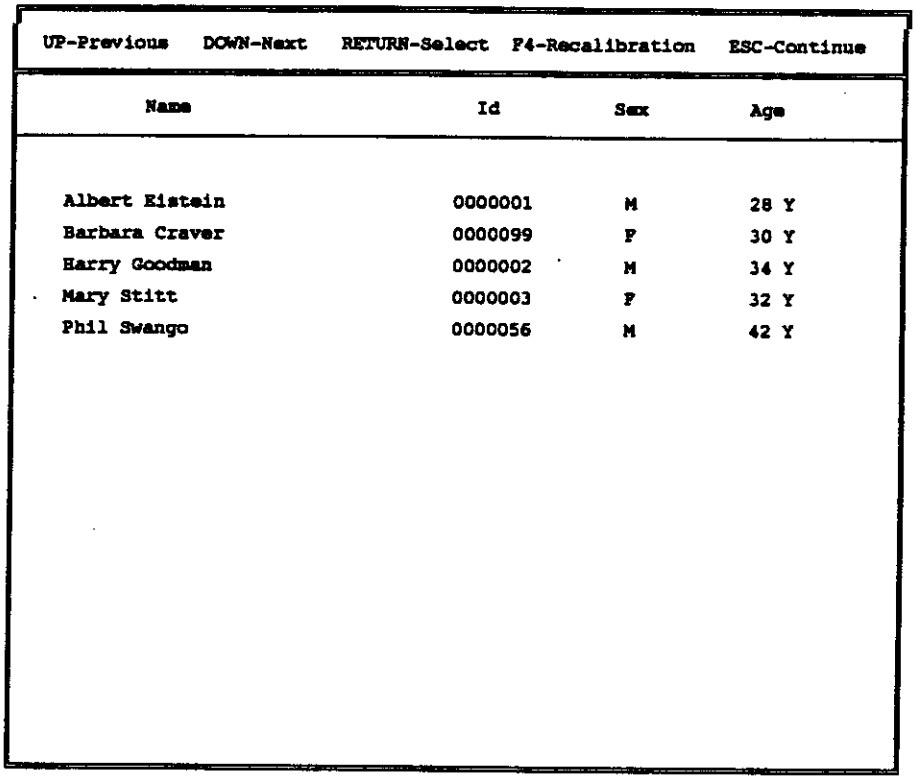


UP-Previous DOWN-Next RETURN-Select ESC-Continue

SAM#: [redacted] Name: [redacted] Age: [redacted]

Option/Component	Status	Time
Medical Exclusion	C	00:00:13
Nursing Bottle Caries	E	00:00:00
Soft Tissue	C	00:01:11
Coronal Caries	C	00:02:00
Root Caries	C	00:00:54
Restoration and Condition	C	00:00:43
Traumatic Injuries	C	00:01:28
Occlusal Characteristics	C	00:00:36
Gingival	C	00:01:01
Calculus	C	00:03:44
Loss of Attachment	I	00:00:03
Furcations	C	00:00:32
Prostheses Assessment	E	00:00:00
Denture Questionnaire	E	00:00:00
Exit Screen		

Component Structure
Screen #8



Examination Sequence

The sequence of examinations is similar to that used for paper entry and is determined by the SP's age and medical history.

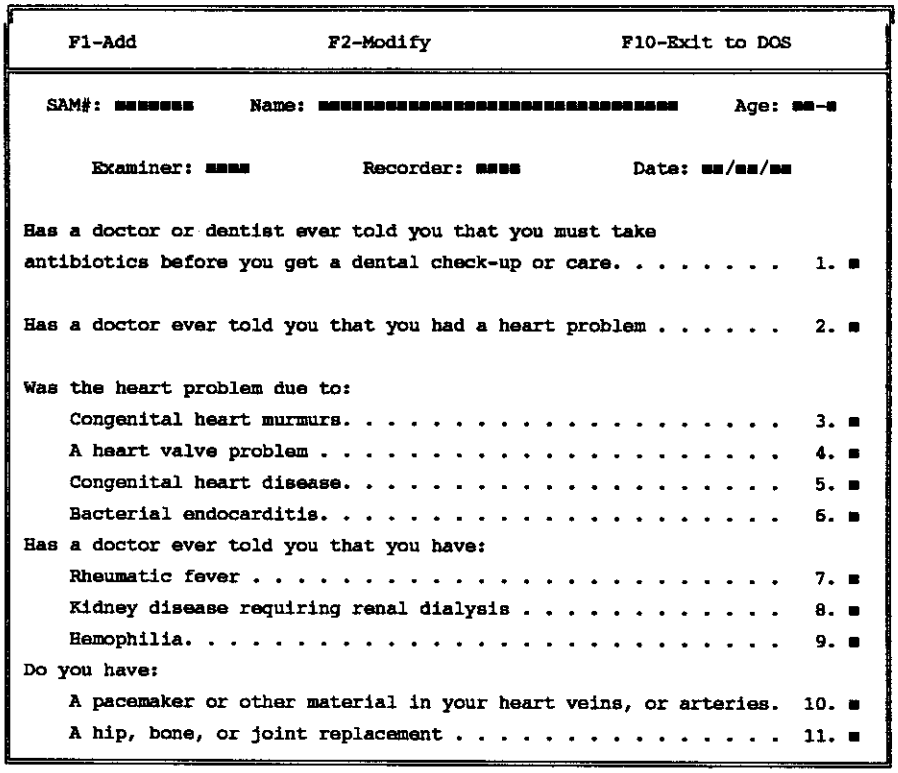
Each component data screen will appear for data entry, and as each is completed, the next appropriate entry screen will appear. Each of the component entry screens is described in detail later in this manual.

Before the first examination of the day, turn on the computer and logon to the NHANES III Oral Health Component System.

After logging on to the computer, you will be presented with the first data entry screen. This screen is used to collect SP identification information and to record the responses to the Medical Exclusion questions.

Entering Examination Data - Adding Records
Initial Entry Screen

When you first enter the system the following screen will appear ---



Examination Sequence

The sequence of examinations is similar to that used for paper entry and is determined by the SP's age and medical history.

Each component data screen will appear for data entry, and as each is completed, the next appropriate entry screen will appear. Each of the component entry screens is described in detail later in this manual.

Before the first examination of the day, turn on the computer and logon to NHANES III Oral Health Component System.

The following Menu will appear on the screen:

"1. Record Dental Examination"

"2. Start New Data File"

"3. Use Old Data File"

"4. Save Current Data File"

"5. Use Most Recent Data File"

"6. List Data Files with Date"

"7. Change Default Dentist I.D. Number"

"0. Exit Menu System"

"choice _____"

Select choice number 1 when you are ready to begin recording examinations.

You will then be presented with the first data entry screen. This screen is used to collect SP identification information and to record the responses to the Medical Exclusion questions.

Entering Examination Data - Adding Records
Initial Entry Screen/SP Header Data

If you are starting a new examination, press F1 to ADD.

If you want to modify an existing SP record, press F2 to MODIFY.

(See page 62 for 'Modifying Records'.)

After pressing F1 the cursor will advance to the SAM # field. Enter the SAM # of the SP.

Enter the full name of the SP, in the form 1st name, middle initial, last name. (Press either TAB or RETURN to advance to the next field.)

Enter the age, in either years or months, of the SP. After entering the number, enter either 'Y' for years or 'M' for months.

If the SP's data has already been transferred from the central computer to the Dental Component Entry System the Name and age will automatically be displayed after the ID number is entered.

(If the age of the SP is 24 months or less, the Nursing Bottle Caries screen will "pop-up" when one of two conditions are met:

- F1 - Is pressed after entering the SP Header Data, or when
- a 'Y' is entered into the first Medical Exclusion question.

See page 24 'Nursing Bottle Caries'.)

Enter the Examiner's ID code.

Enter your ID number in the Recorder field.

Enter the date in the Date field.

(In most instances, the information for the Examiner, Recorder and Date fields will be entered automatically as a default of your MEC's configuration.)

The information entered in the first entry screen creates the 'header' for each SP. Once this information is recorded the examination can begin.

After completing the SP Header section the cursor will advance to the Medical Exclusion section automatically.

There are 12 questions asked by the Examiner which relate directly to the SP's fitness to continue the exam without risk.

As the SP answers each of the Medical Exclusion questions, enter either 'Y' or 'N'. If a 'Y' is entered for any question (except #2) after pressing F1 to complete the section, the system will advance directly to the next appropriate screen. Depending on the answers entered, either the Exit Screen or one of the examination components will be displayed. (See page 60 - The Exit Screen.)

If there are no affirmatives ('Y's) entered for any of the Medical Exclusion questions, press F1 to complete the component.

The system will automatically advance to the next appropriate component.

If the age of the SP is 23 months or less, the following Nursing Bottle Caries pop-up screen will appear after F1 - to complete is pressed or the SP is determined to be 'Medically Excluded':

Nursing Bottle Caries?

Enter 'Y' if nursing bottle caries are present, 'N' if not.

Entering Examination Data - Adding Records
Soft Tissue Lesions

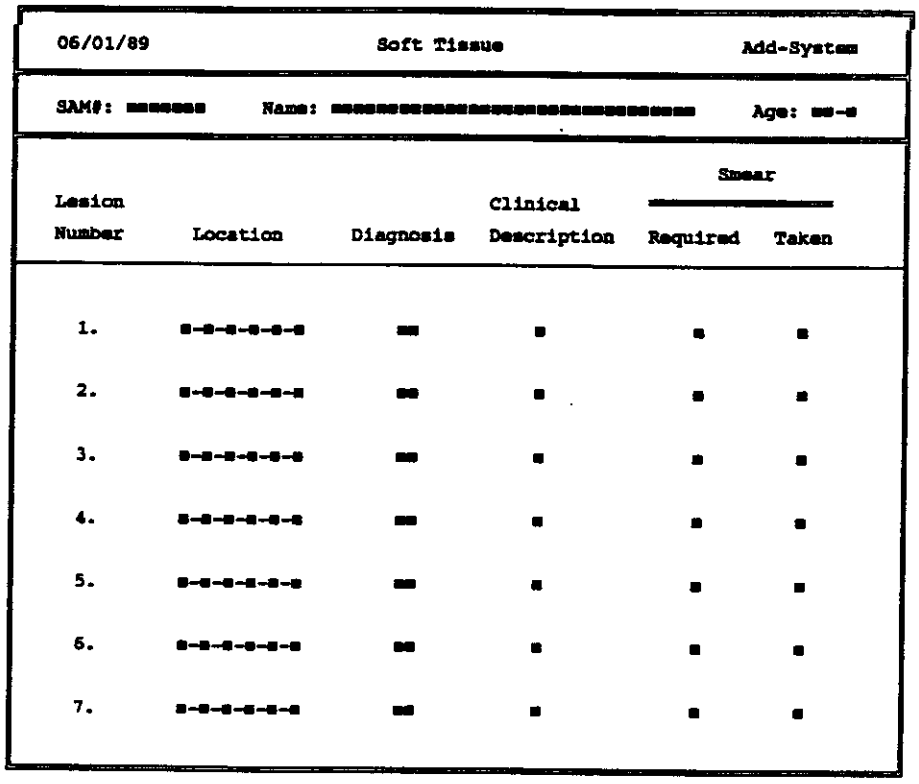
After pressing F1 from a Medical Exclusion component without any 'Y's, the Soft Tissue pop-up prompt will appear in the center of the screen:

If soft tissue lesions are present, enter 'Y'.

If no lesions are present, enter 'N'.

If a 'Y' is entered the system will automatically enter the Soft Tissue Lesion screen.

The Soft Tissue Lesion screen appears as follows:



The following describes each of the data entry sections and their function within the Soft Tissue sub-component.

Location

Each of the possible seven lesions can be located by up to five address codes. Enter each code as they apply. (Note, that if you attempt to enter the same address code twice within a single location, the system will 'beep' and reject the duplicate entry.)

After entering the address code for a lesion, press RETURN to advance to the Diagnosis field.

Diagnosis

The examiner will make a clinical diagnosis for each condition observed. Only one code can be entered for each lesion. The codes and associated meaning can be found in the Examiners Manual.

All Clinical Diagnoses are made up of two digit numeric entries.

Note that certain diagnoses might invoke one or more of the following actions:

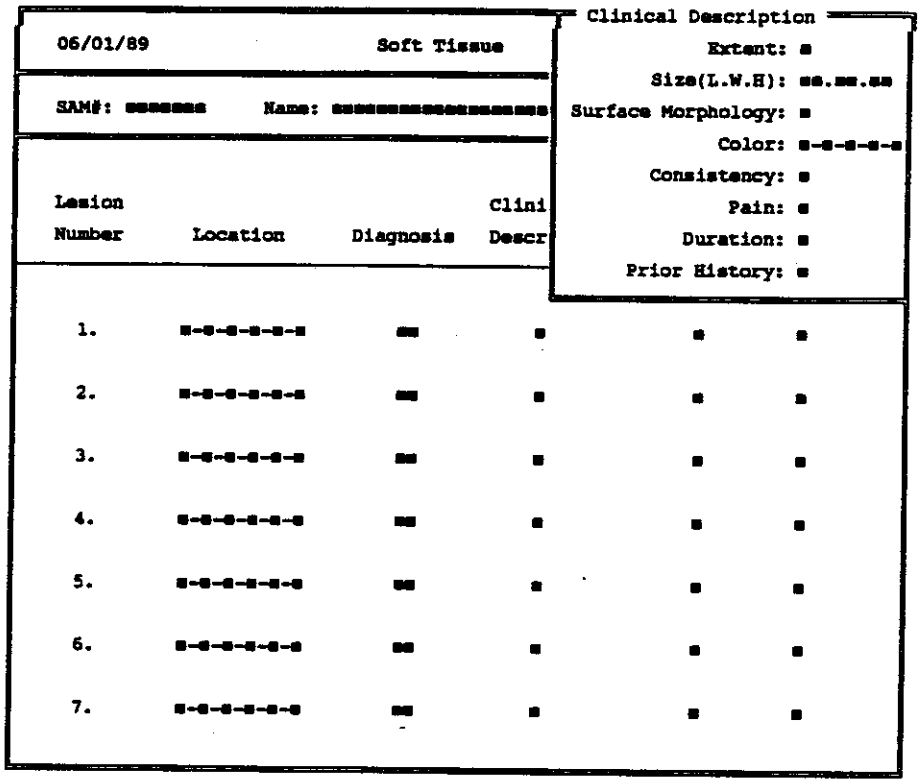
- a Clinical Description
- a smear

The system will automatically detect that such action is appropriate. If a Clinical Diagnosis is entered which requires a Clinical Description (e.g. Erythroplakia, Tumor [non-specific])

the Clinical Description Screen will pop up in the upper right corner of the screen.

Clinical Description

The Clinical Description Screen appears as follows:



The following describes the eight fields within the Clinical Description screen.

Consistency

Acceptable responses are ---

Code	Description
'1'	Soft
'2'	Firm
'3'	Fluid-filled
'4'	N/A
'5'	Other

Pain

Acceptable responses are ---

Code	Description
'1'	Yes
'2'	No
'3'	Don't Know
'4'	N/A

Duration (of Lesion)

Acceptable responses are ---

Code	Description
'1'	Less than 1 week
'2'	1 week - 1 month
'3'	+1 month - 6 months
'4'	+6 months - 12 months
'5'	+12 month - 2 years
'6'	than 2 years
'7'	don't know

Prior History

Acceptable responses are ---

Code	Description
'1'	Yes
'2'	No
'3'	Don't know
'4'	N/A

After completing all entries for the Clinical Description press F1 to complete this sub-component of the Soft Tissue component. The system will advance to the next lesion location.

After all lesions have been recorded, you have the opportunity to perform one of two functions:

- Press F1 to Complete the Soft Tissue component and save the results,

or

- Review the data you have entered and make any changes if necessary.

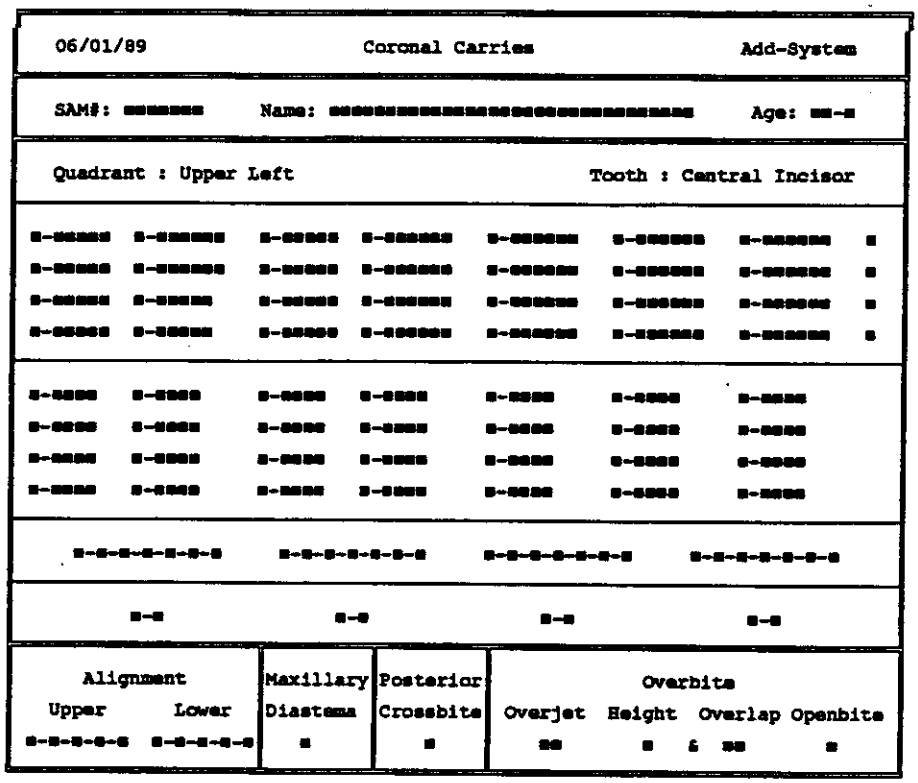
Remember, for every component and sub-component, you may review all data either before pressing F1 to Complete or by selecting 'Review' from the Header Menu after the component has already been completed.

In either case, you can move from field to field (as long as the field contains valid data) to make changes by using either the RETURN, TAB, or directional arrow keys.

To review data entered into the Clinical Description fields, place the cursor on the lesion's diagnosis field and press RETURN. If a clinical description is required for this diagnosis the clinical Description pop-up window will appear.

After completing the Soft Tissue Component the system will automatically advance to the Coronal Caries Component.

The Coronal Caries Entry appears as follows:



You'll note that this entry screen is comprised of more than one component type. At the top of the screen a prompt appears indicating which component is active at any given time.

The Coronal Caries component is divided into four quadrants. Each of the horizontal entry lines represents a quadrant. Each 'box' represents an individual tooth. A box is a single character field, followed by a hyphen and then either a five or six character field. The shorter fields represent teeth which have fewer surfaces.

The 'Quadrant' and 'Tooth' prompts will change according to where the cursor is positioned.

Although the entry screens vary in their layout and design, the sample screen below is an example of how the recorder can always tell what quadrant and tooth is currently selected.

The Quadrant indicator is displayed at the upper left of the entry screen and the Tooth indicator is displayed at the upper right of the entry screen as follows:

The logic behind the recording of tooth calls made during the Coronal Caries (as well as the Root Caries Component below) can best be described as follows:

- the single character field refers to a call made for the entire tooth, and

- the five (or six) character field refers to the individual surfaces of each tooth.

Tooth Calls

The following are acceptable responses to Tooth Calls ---

Code	Description
S	Sound (no decay or filling on any surface)
C	Full crown coverage
U	Unerupted tooth

Code	Description
E	Missing (caries/periodontal disease)
M	Missing (orthodontic or nondisease)
Y	Exclusion (tooth cannot be examined)
D	Sound Deciduous or baby tooth
K	Deciduous tooth with surface call(s)
ER	Missing (caries/periodontal disease) & replaced *
MR	Missing (orthodontic or nondisease) & replaced **
SA	Sealant on permanent, sound tooth. (Press the custom key marked "SA". A "Q" will appear on the screen.)
KA	Sealant on deciduous tooth. (Type 'K' and 'A'.)

* The call will be 'ER', the entry character is a 'Z'.

** The call will be 'MR', the data entry character is '/', a "front-slash".

Surface Calls

The first five characters (positions) of the surface call fields are used to record the presence of either decay or fillings on a particular surface of the tooth.

The sixth character found on most teeth are for 'A's, signifying the presence of sealant. Sealant calls can be made for all teeth except for the upper central incisors, the lower central and lateral incisors and all cuspids. Even though the extended length of these fields (6 instead of 5) identifies them as possible sealant calls, the 'A' can be entered into any character within the field - it isn't restricted to the sixth position.

The five possible tooth surfaces and the corresponding codes to enter for either decay (caries) or fillings are as follows:

Surface	Decay (Caries)	Fillings
Occlusal	X	5
Lingual	0	6
Buccal	1	7
Mesial	2	8
Distal	3	9

The examiner will make a call for each surface with either decay or a filling. The examiner will only make one call for each surface.

Note that the code which represents a corresponding surface for a call can be entered into any of the available positions in the five (or six) character surface call field.

As an example, the following represents the entry for a 1st Bicuspid in the Upper Right quadrant. The tooth call is made as 'K', Deciduous tooth with surface call(s). In this case, there is decay on both the Occlusal and Mesial surfaces and a filling on the Lingual surface:

K-X16

As you can see, the positions themselves are not important - the code which is entered is. If an attempt is made to enter the same surface call twice within one tooth, the system will 'beep' and wait for a valid entry.

If all teeth are sound within a given quadrant, press the 'S' key and the 'Alternate' key simultaneously. Wherever your cursor is positioned within the quadrant when this is performed, the rest of the teeth in that quadrant will be marked 'S' for sound.

This procedure holds true for the following whole quadrant calls:

S, C, E, ER(Z), M, D and Y

Sealant

As mentioned above, the sixth character found in all teeth accept incisors and cuspids are for 'A's, signifying the presence of sealant. Sealant calls can be made for all posterior teeth and upper and lower lateral incisors.

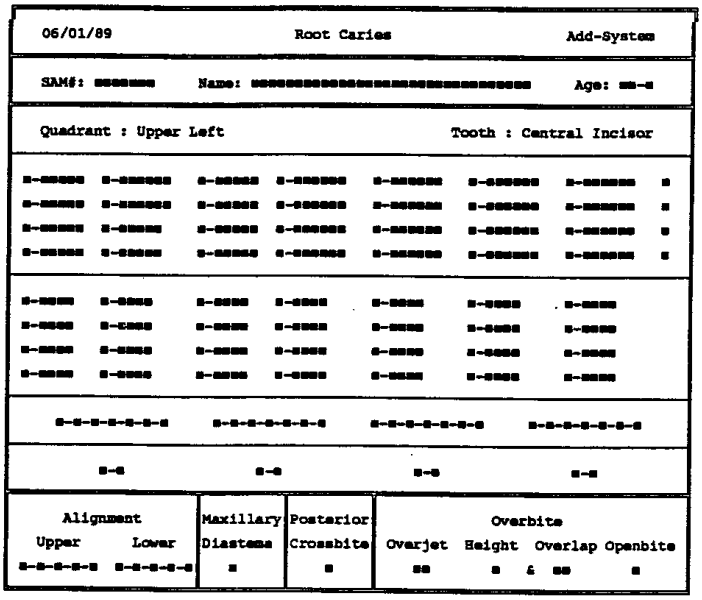
Third Molars

There is a single character field at the end of each quadrant's entry line. Enter a 'Y' if the third molar is present, or an 'N' if it is not.

You'll notice the system will not allow you to advance beyond that quadrant until either a 'Y' or an 'N' has been recorded.

As in every component, once you've verified the data is correct for each entry made, press F1 to Complete the component. The system will automatically go to the Root Caries section below the Coronal Caries component.

The Root Caries component entry screen appears as follows:



The Root Caries component follows the same logic as the Coronal Caries component.

The component is divided into quadrants. Within each quadrant, each root (tooth) is represented by an overall root call. The root calls which can be entered are as follows:

Code	Description
R	Roots are sound
M	Not present

Code	Description
Y	Exclusion (root cannot be scored)

If decay (caries) or fillings are observed the same codes are used to record their presence as in the Coronal component, (with the obvious exception of the Occlusal surface).

For your reference those codes are:

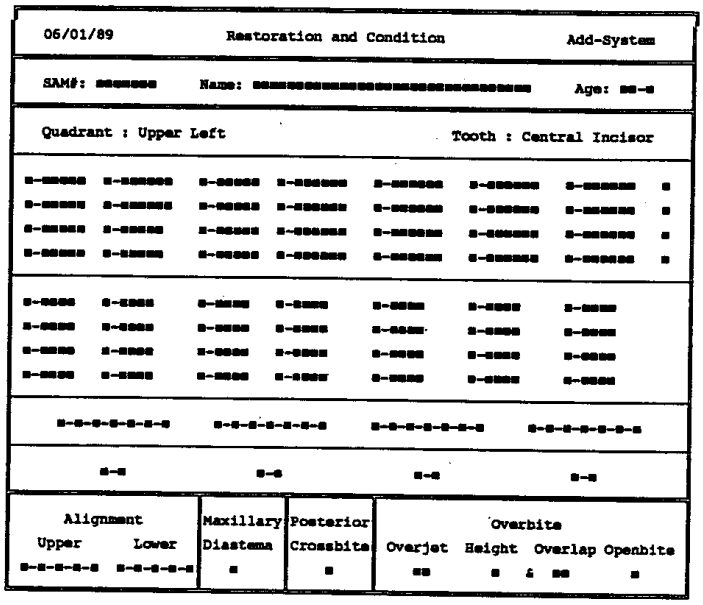
Surface	Decay (Caries)	Fillings
Lingual	0	6
Buccal	1	7
Mesial	2	8
Distal	3	9

If all roots for an entire quadrant are sound, use the short-cut noted above and press 'R' and the 'Alternate' key simultaneously. All the remaining roots in that quadrant will be scored 'R' and the cursor will advance to the next quadrant.

Once you've verified the data is correct for each entry made, press F1 to Complete the component. The system will automatically go to the Tooth Conditions section below the Root Caries component.

Entering Examination Data - Adding Records
Tooth Conditions

The Tooth Conditions and Restoration Assessment entry screen appears as follows:



The Tooth Conditions and Restoration Assessment component records the general condition of each tooth. The entry fields are divided into the four quadrants, and within each quadrant there is room for a single call for each tooth.

The following details the range of possible tooth calls:

Code	Description
0	No treatment needed (Sound tooth)
1	Defective margin on restoration
2	Missing, partly missing, loose, fractured, or temporary restoration
3	Recurrent decay on an intra-coronal restoration
4	Recurrent decay on a crown
5	Missing, loose, or temporary crowns or bridges, broken connectors, and/or missing veneer material or posterior crowns or bridges
6	Fracture of tooth structure associated with a restoration, crown, or bridge.
7	Pulpal involvement evident
8	Retained root(s) evident
Y	Cannot be assessed

It is also possible to make an entire 'Quadrant call' if all teeth in a particular quadrant share the same diagnosis.

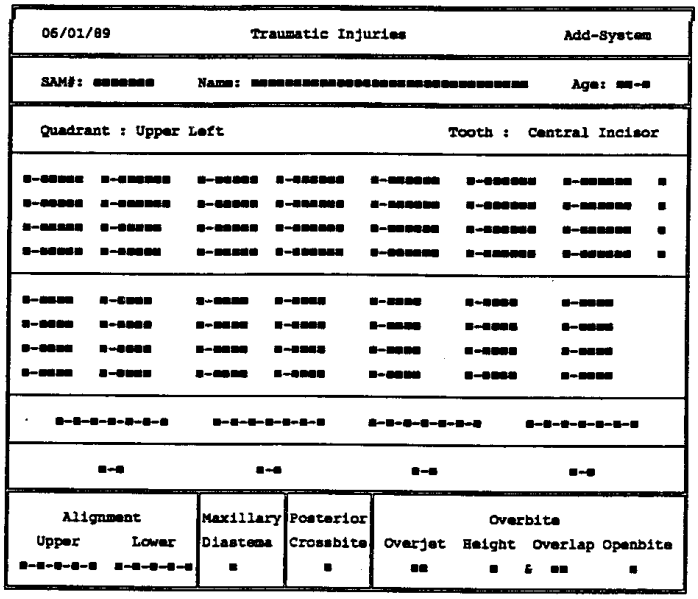
Press 0 (zero) while holding down the 'Alternate' key if no treatment is needed or if no tooth conditions in a quadrant are detected.

Press Y and the 'Alternate' key simultaneously if all teeth in a quadrant cannot be assessed.

Remember, each tooth can receive only one call, and a call code must be entered for each tooth.

Once you've verified the data is correct for each entry made, press F1 to Complete the component. The system will automatically go to the Trauma component section below the Tooth Conditions component.

The Traumatic Injuries Assessment component entry screen appears as follows:



The recording logic is similar to that in the previous Tooth Condition section, except that only the Central and Lateral Incisors in each quadrant are scored.

The first pair of single character fields represent the upper left incisors; the second pair, the upper right; the third, the lower left; and the fourth, the lower right.

(Remember, the two prompts which appear in the upper right and left of the entry screen will always display the current tooth and quadrant being recorded.)

The following details the range of possible calls for each incisor:

Code	Diagnosis
0 (zero)	Tooth has no evidence of traumatic injury
1	An unrestored enamel fracture is present that does not involve the dentine
2	An unrestored fracture which involves the dentine
3	Untreated damage as evidenced by one of the following: a) dark discoloration, as compared to other teeth or b) presence of swelling and/or fistula in the labial or lingual vestibule adjacent to an otherwise healthy tooth
4	A fracture has been restored either with a full crown or a less extensive restoration
5	The presence of a lingual restoration as a sign of endontic therapy, and a positive history from a subject of root-canal treatment following traumatic injury
6	A tooth missing due to trauma
Y	Any tooth or space that does not fall within the preceding categories. For example, a missing tooth due to reasons other than trauma, or a full crown restoration of a carious tooth.

Each tooth can receive only one call, and a call code must be entered for each tooth.

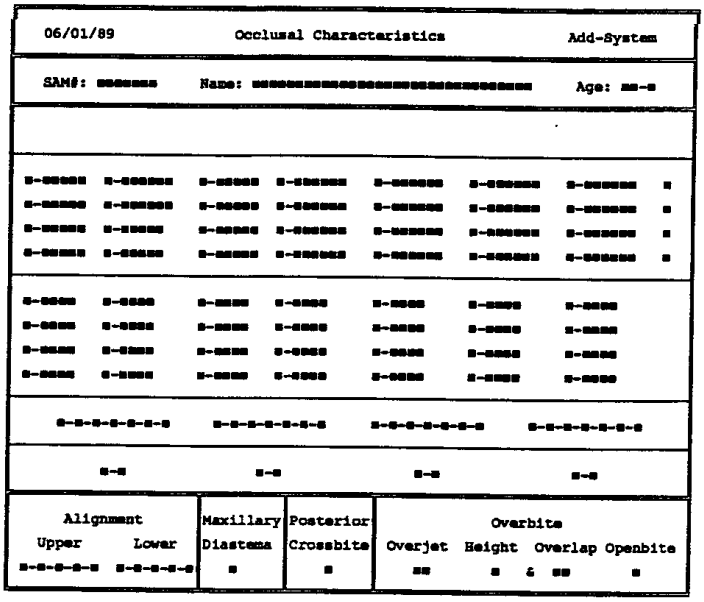
If there is no trauma in any of the eight incisors, press '0' while holding down the 'Alternate' key.

If it is not possible to access any of the the eight incisors, press 'Y' while holding down the 'Alternate' key.

Once you've verified that the data are correct for each entry made, press F1 to Complete the component. The system will automatically go to the Occlusal Assessment component section below the Traumatic Injuries Assessment component.

Entering Examination Data - Adding Records
Occlusal Assessment

The Occlusal Assessments component entry screen appears as follows:



There are six separate sections of this component. The table below details each of these sections and the range of valid data that can be entered for each:

Section	Valid Data
Alignment	Measurement from 0 - 9 'Y' if measurement can't be made

Entering Examination Data - Adding Records
Occlusal Assessment

Section	Valid Data
Maxillary Diastema	'0' (zero), '1' or 'Y'
Posterior crossbite	'0' (zero), '1' or 'Y'
Overjet	Measurement from -9 to +9 If negative, 'minus' sign must be entered in first position 'Y' if measurement can't be made
Overbite *	Measurement from -9 to +9 If negative, 'minus' sign must be entered in first position. 'Y' if measurement can't be made.
Openbite	Measurement from 0 to + 'Y' if measurement can't be made

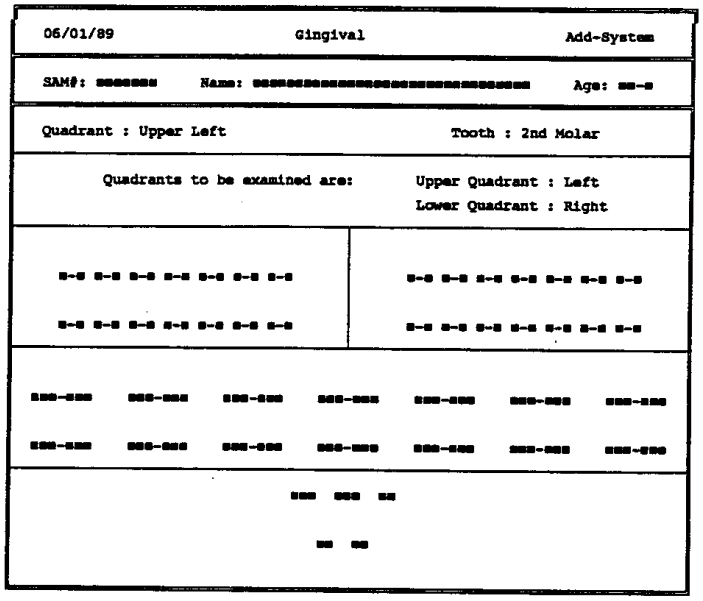
* The system will not accept an 'Overbite' measurement and an 'Openbite' measurement for the same SP. If contradictory data are entered, the system will 'beep' and wait for acceptable data to be re-entered.

To skip over 'Overbite' and enter a code into 'Openbite' enter a 'Y' in the Overbite-Height field. This will fill all Overbite information with 'Y's and place the cursor on Openbite. Note both Overbite and Openbite cannot be coded 'Y'.

You'll note that each of the separate sub-component sections are treated as part of the same Occlusal Characteristic component. That is, as each is completed the cursor is advanced to the next section without the necessity of reviewing and pressing F1 to 'Complete'.

As in all components, once the data has been verified, press F1 to 'Complete'. The system will automatically advance to the next appropriate component.

The Gingival Assessment entry screen appears as follows:



Note that the screen changes completely when the system advances to the Periodontal Assessment entry screen, but the SP ID data is still displayed at the very top of the screen.

Only two quadrants are examined for each SP. The system automatically selects the two quadrants at the beginning of the data entry for the component and displays the selected quadrants on the screen.

As soon as you enter the component entry screen a prompt will be displayed indicating which quadrants are to be examined.

The system automatically advances the cursor to the upper quadrant first and, when that is completed, advances to the lower quadrant.

The two quadrants selected remain active for all four components of the Periodontal exam:

Gingival, Calculus, Loss of Attachment and Furcations

As in previous screens, the current Quadrant and Tooth locations are always displayed at the upper right and left of the entry screen.

Gingival Assessment

The Gingival Assessment begins at the back of the mouth from the 2nd molar and moves forward toward the front.

Gingival assessments are made for both the Buccal and Mesiobuccal surfaces of each tooth. There are three valid responses for each surface. They are:

Code	Diagnosis
'Y'	An assessment can't be made
'0'	No bleeding
'1'	Bleeding

(If no assessment can be made for an entire quadrant, press 'Y' while holding down the 'Alternate' key.)

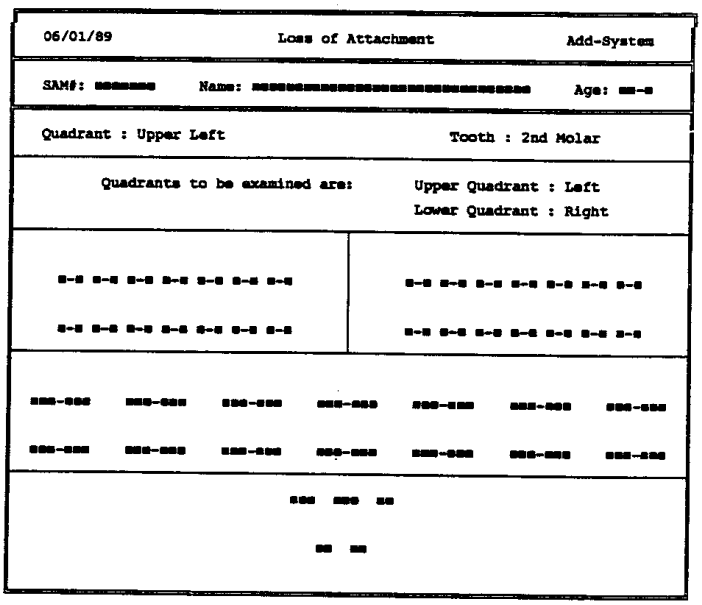
A score must be made for each surface.

When the data has been verified, press F1 to 'Complete'. The system will automatically advance to the Calculus component.

When the data has been verified, press F1 to 'Complete'. The system will automatically advance to the Loss of Attachment component.

Entering Examination Data - Adding Records
Loss of Attachment

The Loss of Attachment entry screen appears as follows:



A three character field is used to enter the score for each tooth surface in each of the selected quadrants. The first position has two specific functions. It will accept either:

- a 'Y' to indicate that no assessment can be made for that tooth, or

- a "minus sign" to indicate that the first measurement is a negative number.

The remaining two characters in the field will contain the two measurements made during the loss of attachment assessment for each tooth surface.

Both measurements will be given by the examiner in millimeters. The first measurement is the distance from the free gingival margin (FGM) to the cementoenamel junction (CEJ). The calls range from 0 to 12 millimeters. Only this first measurement can be a negative number. In this case, enter a "-" (minus sign) in the first position of that tooth's field, then the measurement in the second position.

If measurements exceed 9 millimeters, the following alpha keys are used to indicate 10 - 12:

10 = A
11 = B
12 = C

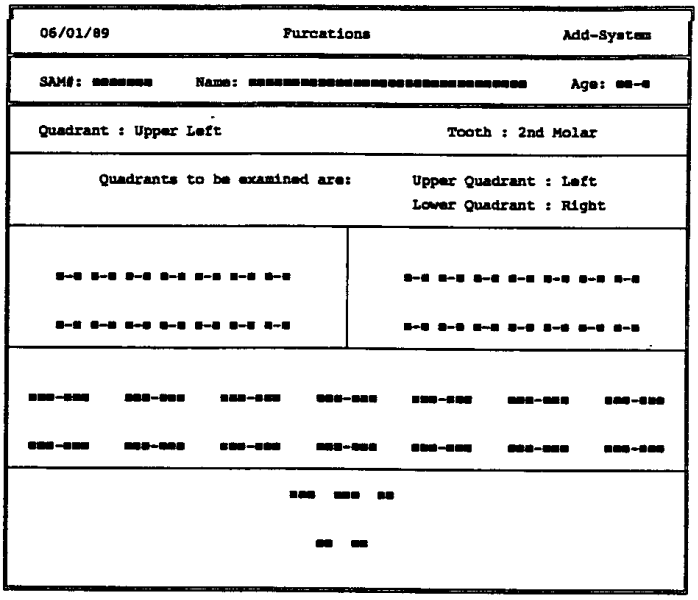
The second measurement (FGM) to pocket depth) is entered into the third position of the particular tooth surface field.

It is important to remember that the second measurement must be equal to, or larger than the first measurement. If a lesser number is entered into the second measurement, the system will 'beep' and wait for valid data to be entered.

If no assessment can be made for an entire quadrant, press 'Y' while holding down the 'Alternate' key.

Once the data has been verified, press F1 to 'Complete'. The system will automatically advance to the Furcation Assessment component.

The Furcation Assessment entry screen appears as follows:



Furcation calls can be made for the selected upper and lower quadrants. The teeth scored are the maxillary and mandibular first and second molars and the maxillary first bicuspids.

Acceptable entries are as follows:

Code	Description
0	No involvement

Code	Description
1	partial involvement, not passing through the furcation
2	through and through involvement in which an explorer can be passed between the roots through the entire furcation.
Y	a specific surface on the maxillary or mandibular molars cannot be assessed (i.e. missing).

The surfaces called for each teeth are as follows:

Tooth	Surfaces
Upper, 2nd Molar	Distal, Buccal, Mesial
Upper, 1st Molar	Distal, Buccal, Mesial
Upper, 2nd Bicuspid	Distal, Mesial
Lower, 2nd Molar	Buccal, Lingual
Lower, 1st Molar	Buccal, Lingual

If all teeth in a quadrant are missing or cannot be scored, press 'Y' and the 'Alternate' key simultaneously.

Once the data has been verified, press F1 to 'Complete'. The system will automatically advance to the next appropriate component.

Entering Examination Data - Adding Records
Prostheses Assessment

The system uses information entered in previous components to determine whether a Protheses Assessment and/or Denture Questionnaire are appropriate for each component.

(An example is, 'M'issing teeth calls were made during the Coronal Caries Assessment.)

The age of the SP is also a determinant in whether this assessment is called for.

If this component is called for, the following entry screen will appear:

06/01/89	Prostheses Assessment	Add-System
SAM#: ■■■■■■	Name: ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■	Age: ■■-■
PROSTHESES ASSESSMENT Upper ■-■■■■■ Lower ■-■■■■■		

DENTURE QUESTIONNAIRE	Upper Arch	Lower Arch
Do you usually wear your (upper/lower) denture (plate)?	■	■
During the past year, have you had problems with your denture(s) (plate)?	■	■
Do you think that you need (a) new denture(s) (plate) or that the one you have needs refitting?	■	■
How long has it been since you had any natural teeth to chew with in your (upper/lower) jaw?	■	■

There is a field for both the upper and lower jaws. There are two types of valid data entered. Valid entries for the first character to the left of the hyphen are as follows:

Code	Description
'F'	Full dentures
'P'	Partial dentures
'Y'	Unable to evaluate

The next five characters to the right of the hyphen will accept the following codes:

Code	Description
'0'	Absence of specified criteria
'1'	Presence of specified criteria

The five conditions scored as either '0' or '1' are as follows:

Character	Call
#1	Integrity
#2	Tooth wear
#3	Reline material
#4	Stability
#5	Retention

Once the data has been verified, press F1 to 'Complete'. The cursor will advance to the Denture Questionnaire entry screen below.

The Dental Questionnaire entry screen appears as follows:

06/01/89	Denture Questionaire	Add-System
SAM#: ■■■■■■	Name: ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■	Age: ■■-■
PROSTHESES ASSESSMENT Upper ■-■■■■■ Lower ■-■■■■■		

DENTURE QUESTIONNAIRE	Upper Arch	Lower Arch
Do you usually wear your (upper/lower) denture (plate)?	■	■
During the past year, have you had problems with your denture(s) (plate)?	■	■
Do you think that you need (a) new denture(s) (plate) or that the one you have needs refitting?	■	■
How long has it been since you had any natural teeth to chew with in your (upper/lower) jaw?	■	■

As in the the Prostheses Assessment, information entered in earlier components determines whether this section is appropriate.

There are four questions to be answered.

Answers to questions #2 and #3 are entered either as "Y" for yes or "N" for no.

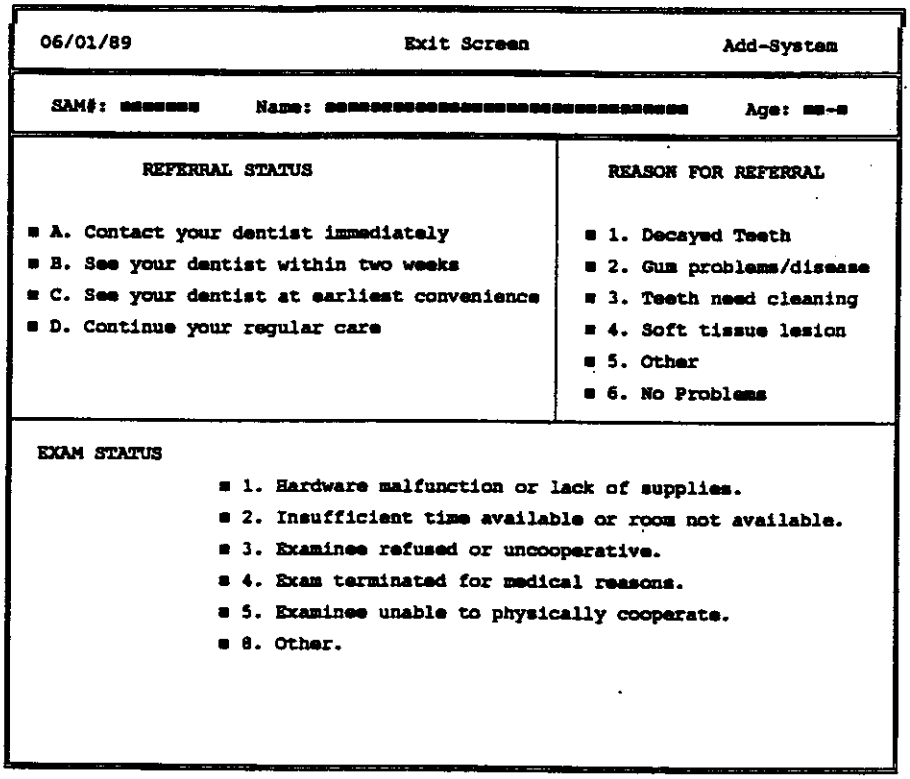
Answers to questions #1 and #4 are entered as a single number, ranging from "1" to "4" for questions #1, and from "1" to "5" for question #4.

As entries are made, the cursor advances to next question within the upper arch. After the fifth entry is made, the cursor automatically advances to the first question in the lower arch if previously entered data within the Coronal Caries component determines that the next arch is edentulous.

Once the data have been verified, press F1 to 'Complete'. The system will automatically advance to the Exit Screen.

Entering Examination Data - Adding Records
Exit Screen

After all appropriate components have been completed, the Exit screen appears as follows:



There are three sections to be completed within this component. They are:

- Referral Status
- Reason for Referral
- Exam Status

Referral Status

When the referrals section title is highlighted, enter the appropriate letter code A, B, C or D as the examiners referral.

If either 'A - Contact your dentist immediately' or 'B - See your dentist within two weeks' is entered a pop-up prompt will appear instructing you to "Follow special referral procedures".

Reason for Referral

Enter the appropriate number code, 1 - 6, for the examiner's reason for making the referral in section 1.

Exam Status

If any component was 'Aborted' (function key F5 was pressed during entry) the system will prompt you for a response to the 'Exam Status'.

Enter the appropriate number code, 1 - 5, or 8 for the examiner's reason for making the referral in section 1.

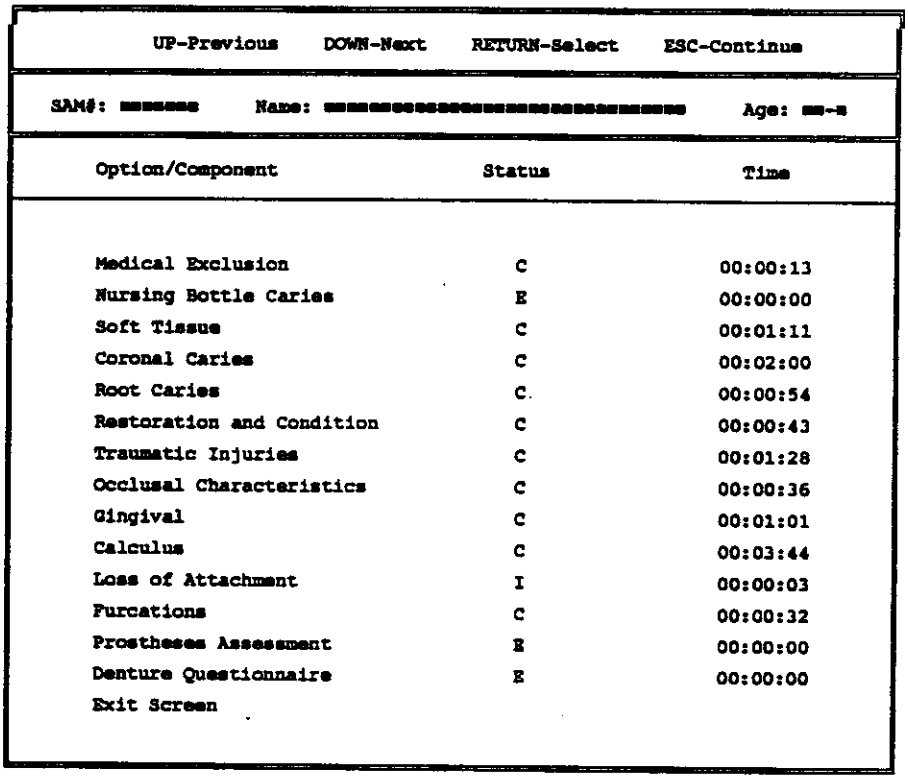
As you can see, entering an answer for each section automatically advances the cursor to the next section. After verifying the data, press F1 to 'Complete'.

The examination has been saved to the data base and you are ready to begin a new exam or quit the program.

Entering Examination Data - Reviewing Records

At any stage of the entry process, it's possible to review any component to make changes. Pressing the 'Escape' key will cause the Review header menu to appear.

Pressing 'F2 - Review' will take you to the Review mode screen which appears as follows:



UP-Previous DOWN-Next RETURN-Select ESC-Continue

SAM#: [redacted] Name: [redacted] Age: [redacted]

Option/Component	Status	Time
Medical Exclusion	C	00:00:13
Nursing Bottle Caries	E	00:00:00
Soft Tissue	C	00:01:11
Coronal Caries	C	00:02:00
Root Caries	C	00:00:54
Restoration and Condition	C	00:00:43
Traumatic Injuries	C	00:01:28
Occlusal Characteristics	C	00:00:36
Gingival	C	00:01:01
Calculus	C	00:03:44
Loss of Attachment	I	00:00:03
Furcations	C	00:00:32
Prostheses Assessment	E	00:00:00
Denture Questionnaire	E	00:00:00
Exit Screen		

As you can see, each of the components is listed in the order in which they appear during the examination. Also displayed is the status and elapsed time spent for each component.

There are three possible codes for the 'Status' of a component. They are:

Code	Description
'C'	Completed
'I'	Incomplete
'E'	Excluded

After a component has been successfully completed (F1 has been pressed), a 'C' is written to the 'Status' field.

If the component was 'Aborted' (F5 from the input header menu) an 'I' is written to the 'Status' field.

If information previously entered (i.e. SP age, 'M'issing teeth) excludes the necessity of a particular component being completed an 'E' is written to the 'Status' field.

The header menu at the top of the Review screen displays the four options available. They are:

UP - Using the 'up' arrow key, move upward from one component to the next.

DOWN - Using the 'down' arrow key, move downward from one component to the next.

RETURN - When a component is highlighted, press RETURN to go to the review/entry screen for that component.

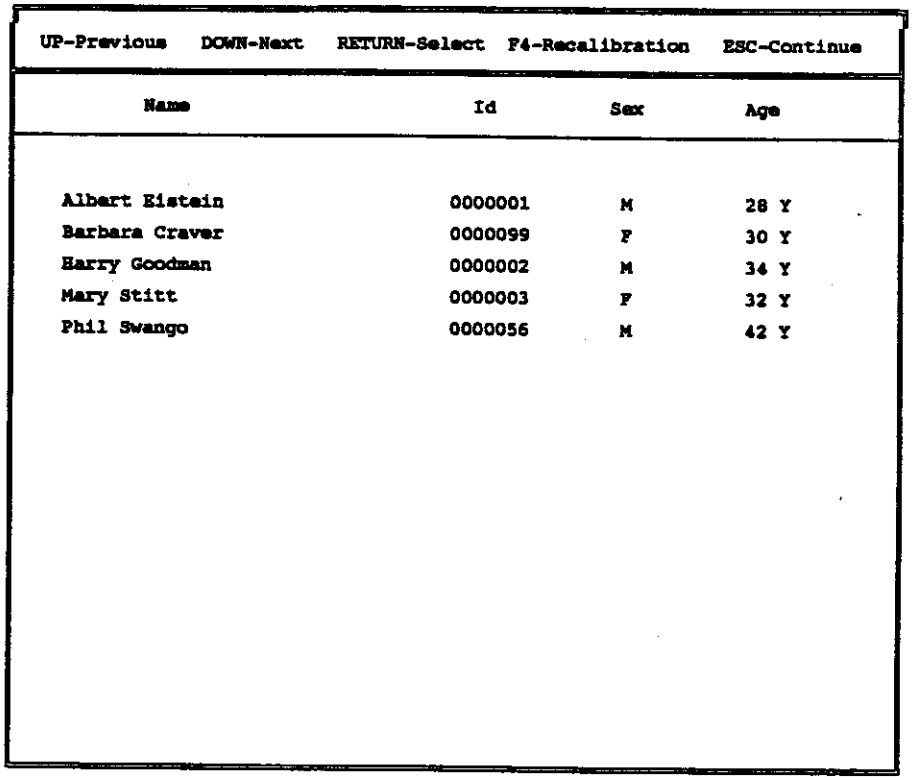
ESCAPE - Return to the component you were at when 'Review' was invoked.

Changes made during 'Review' are automatically stored. It isn't necessary to press 'F1 - Complete'. When you 'Escape' back to the entry program, your changes are saved and you're returned to the component from within which you invoked the Review mode.

Modifying SP Examination Data

Once entered into the Dental Component, an SP's examination data can be called up for review and modification. It's important not to confuse this 'Modify' with the 'Review' function used to make changes to a component during a live examination.

This function can be selected from the initial entry screen by pressing 'F2 - Modify'. After pressing F2 a screen will be displayed listing all SP's currently on file. A sample of this display screen appears as follows:



This screen functions much like the 'Review' screen within a live examination, that is, use the UP and DOWN arrows to move from SP to SP, press RETURN to display a particular SP's examination data when the desired SP is highlighted, and press 'ESCAPE' to return to the initial entry screen.

Use 'Page Down' to advance to the next screen of SPs, and use 'Page Up' to return to the previous screen. All changes made during 'Modify' are automatically stored.

Appendix A

05/12/89 -System

SAM#: 1051660 Name: Jaime■Andino■■■■■■■■■■■■■■■■■■■■ Age: 27-Y

Examiner: 3501 Recorder: 1001 Date: 02/17/89

Has a doctor or dentist ever told you that you must take antibiotics before you get a dental check-up or care. . . . . 1. N

Has a doctor ever told you that you had a heart problem . . . . . 2. N

Was the heart problem due to:
- Congenital heart murmurs. . . . . 3. ■
- A heart valve problem . . . . . 4. ■
- Congenital heart disease. . . . . 5. ■
- Bacterial endocarditis. . . . . 6. ■

Has a doctor ever told you that you have:
- Rheumatic fever . . . . . 7. N
- Kidney disease requiring renal dialysis . . . . . 8. N
- Hemophilia. . . . . 9. N

Do you have:
- A pacemaker or other material in your heart veins, or arteries. 10. N
- A hip, bone, or joint replacement . . . . . 11. N

05/12/89 -System

SAM#: 1051660 Name: Jaime■Andino■■■■■■■■■■■■■■■■■■■■ Age: 27-Y

Lesion Number	Location	Diagnosis	Clinical Description	Smear Required	Smear Taken
1.	■-■-■-■-■-■	■■	■	■	■
2.	■-■-■-■-■-■	■■	■	■	■
3.	■-■-■-■-■-■	■■	■	■	■
4.	■-■-■-■-■-■	■■	■	■	■
5.	■-■-■-■-■-■	■■	■	■	■
6.	■-■-■-■-■-■	■■	■	■	■
7.	■-■-■-■-■-■	■■	■	■	■

05/12/89 -System

SAM#: 1051660 Name: Jaime■Andino■■■■■■■■■■■■■■■■■■■■ Age: 27-Y

Quadrant : Tooth :

Z-■■■■■	C-■■■■■■	S-■■■■■	■-5■■■■■	■-59■■■■	■-568■■■	■-5■■■■■	N
Z-■■■■■	C-■■■■■■	■-1■■■■	■-5■■■■■	■-59■■■■	E-■■■■■■	■-5■■■■■	Y
S-■■■■■	■-3■■■■	S-■■■■■	E-■■■■■■	■-5■■■■■	E-■■■■■■	E-■■■■■■	Y
S-■■■■■	S-■■■■■	S-■■■■■	■-5■■■■■	■-5■■■■■	E-■■■■■■	■-5■■■■■	Y
M-■■■■	R-■■■■	R-■■■■	R-■■■■	R-■■■■	R-■■■■	R-■■■■	
M-■■■■	R-■■■■	R-■■■■	R-■■■■	R-■■■■	M-■■■■	R-■■■■	
R-■■■■	R-■■■■	R-■■■■	M-■■■■	R-■■■■	M-■■■■	M-■■■■	
R-■■■■	R-■■■■	R-■■■■	R-■■■■	R-■■■■	M-■■■■	R-■■■■	

0-0-0-0-0-0-0	0-0-0-0-1-Y-0	0-0-0-Y-0-Y-Y	0-0-0-0-0-Y-0
Y-Y	Y-Y	0-0	0-0

Alignment		Maxillary Diastema	Posterior Crossbite	Overbite			
Upper	Lower			Overjet	Height	Overlap	Openbite
Y-Y-Y-Y-Y	0-0-1-0-0	Y	Y	Y■	Y	& YY	Y

5/12/89 -System

SAM#: 1051660 Name: Jaime■Andino■■■■■■■■■■■■■■■■■■■■ Age: 27-Y

Quadrant : Tooth :

Quadrants to be examined are: Upper Quadrant : Right
Lower Quadrant : Right

0-0 Y-Y 0-0 0-0 1-0 1-1 Y-Y	0-2 Y-Y 0-0 0-0 0-0 0-0 Y-Y
0-0 Y-Y 0-0 0-0 0-0 0-0 0-0	0-2 Y-Y 0-2 0-2 0-2 2-2 2-2

■22-■12	Y■■-Y■■	■01-■22	-11-■33	■01-■22	■02-■02	Y■■-Y■■
■01-■33	Y■■-Y■■	■12-■22	-11-■11	■01-■22	■12-■22	■12-■22

000 YYY 00

00 YY

05/12/89 -System

SAM#: 1051660 Name: Jaime■Andino■■■■■■■■■■■■■■■■■■■■■■ Age: 27-Y

PROSTHESES ASSESSMENT

Upper ■-■■■■■ Lower ■-■■■■■

DENTURE QUESTIONNAIRE	Upper Arch	Lower Arch
Do you usually wear your (upper/lower) denture (plate)?	■	■
During the past year, have you had problems with your denture(s) (plate)?	■	■
Do you think that you need (a) new denture(s) (plate) or that the one you have needs refitting?	■	■
How long has it been since you had any natural teeth to chew with in your (upper/lower) jaw?	■	■

5/12/89 -System

SAM#: 1051660 Name: Jaime■Andino■■■■■■■■■■■■■■■■■■■■■■ Age: 27-Y

REFERRAL STATUS

■ A. Contact your dentist immediately
■ B. See your dentist within two weeks
K C. See your dentist at earliest convenience
■ D. Continue your regular care

REASON FOR REFERRAL

X 1. Decayed Teeth
■ 2. Gum problems/disease
■ 3. Teeth need cleaning
■ 4. Soft tissue lesion
■ 5. Other
■ 6. No Problems

EXAM STATUS

■ 1. Hardware malfunction or lack of supplies.
■ 2. Insufficient time available or room not available.
■ 3. Examinee refused or uncooperative.
■ 4. Exam terminated for medical reasons.
■ 5. Examinee unable to physically cooperate.
■ 8. Other.