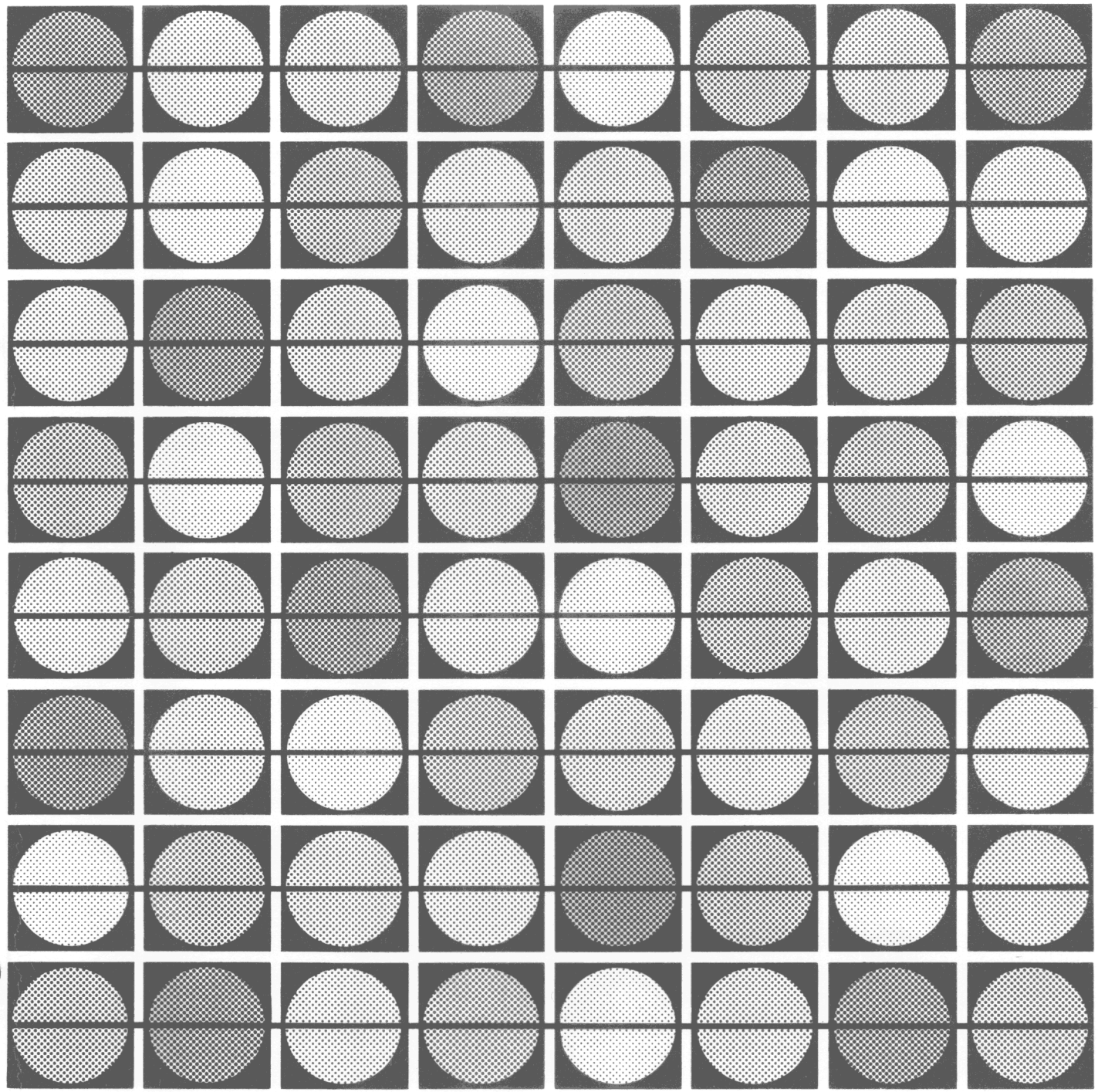


# Instruction Manual Part 15d



Dental Examiner's Manual for the  
Hispanic Health and Nutrition  
Examination Survey, 1982-84

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES • Public Health Service • National Center for Health Statistics



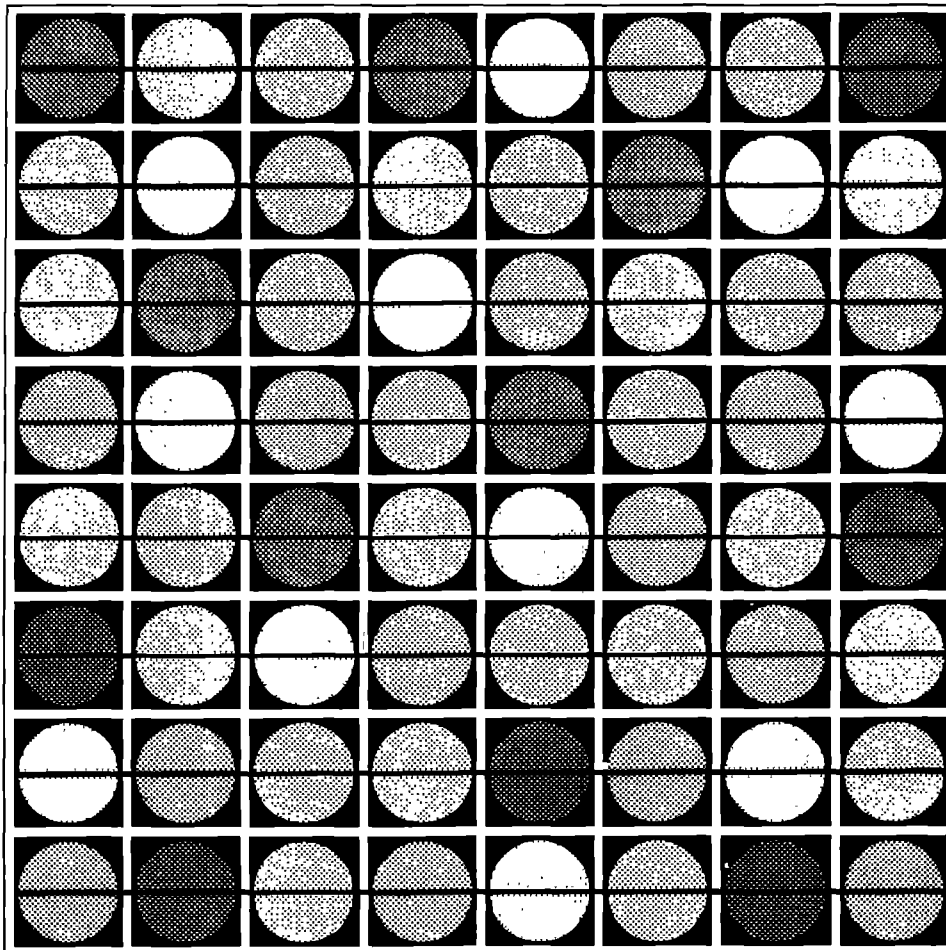
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Volumes I and III of this manual were prepared by Westat. Volume II was prepared by the National Institute of Dental Research, National Institutes of Health.

# Instruction Manual Part 15d

Dental Examiner's Manual for the  
Hispanic Health and Nutrition  
Examination Survey, 1982-84

## HHANES Data Collection



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
National Center for Health Statistics

Hyattsville, Maryland  
August 1985

## DENTAL EXAMINER'S MANUAL

### PREFACE

There are three volumes of the Dental Examiner's Manual for the Hispanic Health and Nutrition Examination Survey (Hispanic HANES).

Volume I, prepared by Westat, contains an overview of the survey, a description of the responsibilities of each dental team member, and instructions on non-dental examination procedures. As you read through Volume I of the manual you will notice that you will have responsibilities for tasks in addition to the actual examination while you are in the field. The successful completion of this study requires that the examiner and the recorder act as a team and work together to see that necessary tasks are completed.

Volume II, the Dental Examination Calibration Manual, contains information on the various dental indices and procedures that are to be used during the dental examination. This volume has been prepared by the National Institute of Dental Research, National Institutes of Health.

In order to have a complete understanding of the dental examination procedures, one must read both Volumes I and II.

Volume III, the Vision Test Manual, contains specifications for the vision examination. This volume was prepared by Westat.

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DENTAL EXAMINER'S MANUAL

**Volume I - General Procedures**



## Chapter 1

### OVERVIEW OF THE HISPANIC HANES

#### 1.1 Introduction

The Hispanic Health and Nutrition Examination Survey (HHANES) is being conducted by the National Center for Health Statistics (NCHS), U.S. Public Health Service. The survey will involve a sample of approximately 16,000 persons with Hispanic backgrounds who are 6 months through 74 years of age. Information will be collected about each sample person through interviews. In addition, about 12,000 of these sample persons will participate in the examination part of the survey.

The Dental Examiners Manual is intended to serve as a training text as well as a reference source for your use throughout the survey. The manual describes the survey in detail, specifies the roles of the dental team members and explains the procedures to be followed prior to, during and following the examination, and suggests resolutions for problem situations.

#### 1.2 History of the National Health and Nutrition Examination Survey Program

The National Health Survey Act, passed in 1956, provided the legislative authorization for a continuing survey to provide current statistical data on the amount, distribution, and effects of illness and disability in the United States population. In order to fulfill the purposes of this Act, it was recognized that at least three types of information should be collected: commentary about the health status of a sample of people themselves by direct interview; clinical tests, measurements, and physical examinations of sample persons; and abstracts of records and interviews with staff at places where persons received medical care such as hospitals, clinics, and doctors' offices.

Between 1959 and 1980, NCHS conducted five separate examination surveys. The first National Health Examination Survey (NHES I) focused mainly on selected chronic diseases of adults aged 18-79. NHES II and NHES III, conducted between 1963 and 1970, focused primarily on the growth and development of children. Information was also collected on height, weight, and other body measurements, dental health, vision, and hearing ability. These examinations were conducted by highly trained teams of health personnel using carefully calibrated equipment in specially equipped Mobile Examination Centers (MEC's) which provided a standardized environment.

The fourth survey introduced a new emphasis. The study of nutrition and its relationship to health status had become increasingly important as researchers began to discover links between dietary habits and disease. In response to this concern, under a directive from the Secretary of the Department of Health, Education and Welfare, the National Nutrition Surveillance System was

undertaken by NCHS. The purpose of this system was to measure the nutritional status of the U.S. population and changes over time. However, a special task force recommended that a continuing surveillance system include clinical observation and professional assessment as well as the recording of dietary intake patterns. Thus, the National Nutrition Surveillance System was combined with the National 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 1975. This survey obtained information on a national sample of over 30,000 persons between the ages of 1-74 years. Extensive data on health and nutrition were collected by interview, physical examination, and a battery of clinical measurements and tests from members of the sample. Emphasis was placed on dental health, skin problems, eye conditions, and nutritional status. For adults 25-74 years of age, detailed examination components for determining the prevalence of chronic lung disease, disabling arthritis of the hip or knee, and cardiovascular disease were included. In addition, information on health care needs and general well-being was obtained.

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 so that NHANES I could provide baseline data for assessing changes over time. This meant 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 of 1976 with the goal of examining 21,000 persons between the ages of 6 months and 74 years. This survey was completed in 1980. NHANES II assessed many of the same conditions as did NHANES I. In addition, in NHANES II, measurements of the population's exposure to pesticides were made along with determinations of blood levels of certain trace elements in an effort to study some of the relationships between the environment and health. A detailed diabetes component was also included. A comparison of NHANES II data with the earlier survey data will provide the first look at changes in the health and nutritional status of the population over time.

In addition to NHANES I, NHANES II, and Hispanic HANES, a fourth NHANES project is now underway. This study, the NHANES Epidemiologic Followup Survey, is an attempt to conduct follow-up interviews with the sample population, now aged 35-84, who were interviewed and examined in NHANES I between 1970 and 1974.

### **1.3 Purpose of the Hispanic HANES**

Despite the size, cultural and historical uniqueness, and disadvantaged status of the Spanish-heritage population in the U.S., few studies have been made of their health and nutritional status. Although in recent years health data

have been collected on Hispanics in national surveys, Hispanics were sampled according to their proportion of the total population. Because that proportion is relatively small, the number of Hispanics included in these surveys has been insufficient to permit reliable estimates of various health parameters to be made. Additionally, earlier studies did not include sufficient numbers of people of Mexican, Cuban, and Puerto Rican background to make detailed estimates of health characteristics for each of these groups.

Policy makers in the health field have therefore identified the need to direct special efforts towards the Hispanic population. Additionally, in P.L.94-311, (Roybal Act), Congress mandated the collection of social, health and economic data on Hispanics at the national level.

To accomplish this end, two official groups identified the need for a Health and Nutrition Examination Survey for Hispanics. The National Academy of Public Administration several years ago recommended that following NHANES II, NCHS should undertake studies of subpopulation groups, beginning with Hispanics. At the same time, the Department of Health and Human Services identified goals for a Hispanic Initiative, which included Hispanic HANES.

The objectives of the Hispanic HANES survey are to produce and publish health and nutritional data required to assess the status of health and health care needs of Hispanics, as an aid to policy makers in the health field. More specifically, the Hispanic HANES survey will provide information about diagnosed conditions including those which persons may fail to report or may be incapable of reporting in a survey based upon individual interviews and previously undiagnosed, unattended, and nonmanifested diseases. All procedures, tests, and measurements will be carried out in a uniform and standard manner so that data from this study will be comparable to data collected in previous NHANES. Hispanic HANES data will also be used to create a baseline of statistical information which can be used for comparison with corresponding information gathered from future surveys. Furthermore, Hispanic HANES will use a methodology designed to produce data which can generate reliable estimates for the three major Hispanic subgroups in the U.S.: Mexican-Americans, Puerto Ricans, and Cubans-Americans.

#### **1.4 Method of Data Collection**

The mobile examination center or MEC for Hispanic HANES will be set up as in previous NHANES. The examinations will be conducted in specially equipped MEC's consisting of three mobile trailers each. The trailers will be drawn by detachable truck tractors when moving from one sample location to another. At the examination sites, which will be centrally located areas within the Hispanic communities (such as hospital or shopping center parking lots), the three trailers will be set up side by side and connected by enclosed passageways. The MEC's will provide a standardized environment in which the MEC team will conduct physical and dental examinations, laboratory and physical measurements and tests, and medical and dietary interviews.

The MEC examination team will consist of a variety of interviewing and medical personnel. Although MEC personnel will be composed of NCHS, Westat and Development Associates employees, the MEC will operate as a totally unified team effort. For the Hispanic HANES each MEC team will consist of the following members:

A Coordinator will have complete authority concerning all administrative matters within the MEC. The primary responsibility of the Coordinator will be to regulate the flow of examinees through the MEC examination process. S/he will set up the examination folders and verify that all exams have been conducted and recorded before each examinee leaves the MEC.

A Physician will conduct the medical examinations. S/he will record and edit the results on Physician Examination Forms.

A Nurse will draw blood for blood tests and will assist the Physician in conducting medical examinations.

A Dentist will conduct dental and vision examinations and will have administrative duties associated with conducting those examinations.

Three Health Technicians will take body measurements, sonograms, X-rays, ECG's, and administer auditory exams. The Health Technicians will also be trained as Dental Recorders. The duties of the Health Technicians will be assigned on a rotating basis.

Two Lab Technicians will conduct medical laboratory tests and record and edit the results.

Two Dietary Interviewers will administer, edit and transmit questionnaires on 24-hour recall of types and frequency of foods consumed. They will assist with the examinee flow if needed and will be responsible for studying the local Hispanic dietary patterns.

A MEC Interviewer will administer, edit and transmit the SP Questionnaire on mental health, alcohol consumption, drug abuse, pesticide exposure and reproductive history.

In the event of illness or other emergency, backups will be provided for all MEC team members who are directly involved in conducting examinations or interviews. Together, the MEC examinations and interviews are expected to take up to three hours for each examinee. Transportation to and from the MEC will be provided for examinees.

The examination components for all examinees will include:

A review of the medical history and a physical examination by a physician

A dental examination

Body measurements, including height, weight, and skinfolds, made by trained technicians

A dietary interview, conducted by experienced nutritionists, covering food consumption and dietary habits

Numerous laboratory tests on blood and urine specimens

Depending on the age of the participant, the rest of the examination will include some or all of the following:

Diagnostic ultrasound for detection of gallstones

A glucose tolerance test

An electrocardiogram

Tests for hearing and vision

Tests for liver disease

Questionnaires on mental health, alcohol consumption, and drug abuse

Tests for venereal disease

Urine and blood tests to check for the presence of lead, carbon monoxide, and pesticide body burdens

Chest X-rays

Hair tests for trace elements

MEC days of operation are Tuesday through Saturday. There are three possible exam sessions per day: 8:30 a.m. - 12:30 p.m., 1:30 p.m. - 5:30 p.m., 6:00 p.m. - 10:00 p.m. Only two sessions will be scheduled each day. Tuesdays and Thursdays will have morning and evening sessions; Wednesdays, Fridays and Saturdays, morning and afternoon sessions. There are 10 examinee slots per session, so about 20 SP's will be examined in the MEC each day.

The overall role of the MEC team members is to collect data through examination, tests, measurements and interviews. It is absolutely essential that the data collected be consistent within and across the MEC's, as well as with earlier NHANES studies; and these data must be complete and accurate. Each individual staff member is the first and best guarantor of the quality of the data being collected. As such you have a responsibility for quality in every single step of the examination process. The most obvious methods of assuring quality are to perform procedures with accuracy, precision and in a uniform manner according to the specifications provided to you during training and to record completely, accurately, uniformly and legibly. You are urged to suggest areas where quality control procedures need to be instituted and methods for their implementation.

## **1.5 Confidentiality**

For the Hispanic Hanes Study, names of sampled persons will be entered into the NCHS computerized database. However, NCHS data tapes are protected under Section 308(D) of the Public Health Service Act (42 U.S.C. 242m). This law states that NCHS data tapes cannot be given to any other agency or individual, nor can they be subpoenaed by local, state or federal courts.

All information obtained in the Hispanic HANES survey will be held strictly confidential. Westat and Development Associates are firmly committed to the principle that the confidentiality of individual data obtained through surveys must be protected. This principle holds whether or not any specific guarantee of confidentiality was given at the time the data were collected or whether or not there are any specific contractual obligations with the Federal agency who is sponsoring the study. Westat and Development Associates adhere to the provisions of the U.S. Privacy Act of 1974 (PL-93-579) with regard to surveys of individuals for the Federal government. Therefore, employees and consultants of Westat and Development Associates are required to sign a pledge of confidentiality. This pledge states that the person understands that s/he is prohibited by law from disclosing any information obtained while working on the study and pledges to abide by the Assurance of Confidentiality.

## **1.6 Informed Consent**

A letter will be sent to each household which falls into the screening sample explaining that an interviewer will call on that family shortly. After a determination has been made by the interviewer that at least one person in the household is eligible to participate in the survey, and after the household questionnaire material has been administered, the interviewer will discuss the examination phase of the survey with each sample person and give them a copy of the Sample Person Brochure. This brochure has been developed as a means of conveying the contents of the examination, the voluntary nature of participation in the survey, the purpose of the study, and the confidentiality with which any information collected must be treated.

After the sample person has had a chance to review the brochure and ask any questions, the interviewer will read the consent form to the sample person and ask that person to sign the form as an indication of their willingness to participate in the study. If the sample person does not wish to sign the form then they may bring the signed form with them when they come to the exam center, or they may have additional questions answered at the exam center before they sign. Generally, a refusal to sign the consent form will be considered a refusal to participate in the examination phase of the study and examinations will not be done on sample persons who do not sign the consent form. However, should an occasion arise when a sample person is willing to consent to participate in the survey, but refuses on principle to sign any document, the interviewer will, in the presence of a witness, go over the contents of the Sample Person Brochure with that person and note on the form that this has been done. In this instance, the actual participation in the examination phase of the survey will be used as indication of consent.

For minors the signature of a parent or guardian is required on the consent form. Additionally, minors over the age of 12 years will be asked to sign as an indication of assent.

The same form will be used to secure permission to forward the results of the examination to the sample person's own physician or source of health care. A list of clinics and other health care organizations which will accept referrals from the Hispanic HANES will be drawn up during the advance arrangement phase of the field operation and made available to those sample persons who do not have a regular source of health care.

The SP letter, brochure and consent form are printed in both English and Spanish. The interviewer will read the consent form to the SP in the same language that was used during the home interview.

## **1.7 Professional Ethics**

The members of the examining team are professionals who are conducting research as employees of Westat or Development Associates under the sponsorship of the National Center for Health Statistics. Westat and Development Associates strive to maintain and project a sense of professional integrity and honesty to all participants in survey research and expect that all their employees will do the same.

Each person involved in the collection, processing, and analysis of survey data must be continuously aware of the responsibility to safeguard the rights of all survey respondents. Primarily this means protecting the confidentiality of all participants in the study. But in addition, this implies professional conduct both on and off the job. Cooperation from the public is essential to the success of survey research. Westat and Development Associates have expended a great deal of effort in developing and maintaining cooperation from the Hispanic community and the general public. It is the responsibility of each person working for Westat and Development Associates to build on the companies' reputation of integrity so that we can continue to have access to study participants during current and future surveys.

As you travel about the country for the Hispanic HANES survey you may find yourself to be very much in the public eye, particularly in the smaller stands. Sampled persons are justifiably concerned about who will be conducting the examinations. As a result, it is important that you be discreet in speech and actions. The Public Health Service Act requires that you refrain from any discussions about an examinee or the survey which might be overheard and unfavorably misinterpreted. You should exercise good judgment in any discussion of controversial subjects. You should be conscious of the customs of the area and should avoid any actions which might reflect unfavorably upon Westat, Development Associates, and the U.S. Public Health Service or interfere with the work of the survey. Your personal appearance and behavior must be governed by these same considerations.

## Chapter 2

### ROLE OF THE DENTAL TEAM

#### 2.1 Medical Policy Regarding the Examination

The purpose of the Hispanic HANES is to collect data on the health status of the Hispanic population. Unfortunately, health care for minorities is frequently substandard; the role of the MEC team members is to document the effects of such care (or lack of it). Treatment is not within the role of the MEC dentist or physician, and although concern for proper treatment is admirable, such concern should never be allowed to interfere with data collection. We are not set up to treat or manage medical problems. In most instances the examining dentist and physician will not be licensed within the state in which the examinations are being conducted. The malpractice insurance obtained for the Westat dentists and physicians does not cover any type of treatment procedure.

It is also important to keep in mind that we as individuals and as a health research organization have no control over local health care systems. Any involvement beyond routine referral is ineffective and interferes with the purpose of the survey. Referral of examinees has been included in the MEC procedure for ethical reasons even though referral is not within the purpose of the study. Instead we anticipate that the Hispanic HANES data analysis will provide documentation of any substandard care being delivered to the Hispanic population and that this evidence may ultimately provide the impetus for the improvement of local health care systems.

Generally, it is not necessary to discuss findings with the examinees unless referral is needed. A single examination often does not allow an adequate interpretation of findings nor provide enough information so specific advice can be given to an examinee. Only the examinee's personal dentist or community clinic dentist who has the individual's long-term records available and who is primarily involved with the long-term care and followup of the examinee should interpret the findings for the individual and decide what to tell the person. For this reason reports of findings are routinely sent to the examinee's dentist or the nearest community dental clinic. (See Section 4.3 for specific clinical findings which constitute criteria for referral.) The examinee is encouraged to contact his dentist or community dental clinic for results.

Based on the dentist's examination and a review of the dental history provided by the examinee, the dentist should place the examinee in one of three categories:

- Level III No dental findings; minor dental findings that an examinee already knows about, or is under care for, or that does not require prompt attention by a medical care provider.



Level II Major dental findings that warrant attention by a health care provider within the next 30 days because they are expected to cause adverse effects within this time period and they have previously been undiagnosed, unattended, nonmanifested or not communicated to the examinee by his/her personal health care provider.

Level I Major dental findings that warrant immediate emergency attention by a physician while the examinee is in the MEC.

If the examinee is placed in the Level III category, no special steps are required. For such an examinee and, in fact, for all examinees who have consented to releasing the findings, reports of findings will be sent out to the examinee's designated health care provider.

If the examinee is placed in the Level II category, thus requiring early medical care, the examining dentist should ask and get oral consent from the examinee to contact his/her personal physician or clinic as named on the written consent form, verify that this form has been signed by the examinee, then contact that health care provider. When no health care provider has been listed on the signed consent form, the physician may transmit the information to a referral medical facility with the examinee's oral consent. Detailed procedures are presented in Section 4.5.

If the examinee is placed in the Level I category, thus requiring immediate emergency medical attention, the MEC physician should be notified at once. The physician must get oral consent from the examinee to contact an emergency medical service in the area such as a hospital ambulance service or a fire rescue squad, then contact that service. See Section 5.5 on medical emergencies for further instructions.

The examinee should be treated courteously as a person, not as a sample number. Exchanges of information between staff members for the better understanding of an examinee must be discreet.

## **2.2 Organization of the Dental Team**

Membership in the Hispanic HANES carries with it many responsibilities. Not the least of these is your responsibility to recognize that you are one member of a team of professional and paraprofessional persons upon whom certain demands have been placed in order to accomplish the overall task of the Hispanic HANES. You should be aware of and respect the job demands placed upon other staff members, should maintain an attitude of tolerance and consideration for fellow members of the team, and should willingly perform the extra tasks that may occasionally be assigned to support other staff members in the performance of their duties. Staff members may be requested to perform tasks not directly related to their specific professional skills in order to implement the overall organization. Staff members are responsible for appropriate care and safeguarding of expensive portable equipment used during the examination, including storing and locking in instances where applicable.

Within the MEC staff, examination team members will work in small groups to perform specific types of examinations, tests or interviews. Throughout the MEC survey period, the Dentist and the Dental Recorder will work closely together and will form the core of a dental team. Each dental team will be responsible for seeing that a number of tasks are completed at each stand. Although we have divided these tasks into those for which the Recorder will have the primary responsibility and those for which the Dentist will be primarily responsible, we expect that if one team member requires assistance, the other will always be available to help when s/he is finished his/her tasks. The Coordinator who is primarily responsible for examinee flow through the MEC is also considered a member of the dental team. The dental team will jointly be responsible for keeping to the prearranged schedule of SP dental examinations.

Some of the remaining sections of this manual have been written primarily for the Dentist while other sections have been written for the Recorder. However, you should be familiar with all sections of the manual in order to better understand your own role and to be able to assist your team member when s/he needs help.

### **2.3 Role of the Dentist**

The following tasks are the primary responsibilities of the Dentist:

1. **Setting up dental equipment at the beginning of the stand**

Dental supplies and equipment must be unpacked, counted, checked against an inventory sheet and set up at the beginning of each stand. (See Section 3.2 for specific instructions on procedures for setting up equipment.)

2. **Participating in the dry run session**

Before beginning MEC examinations in each stand, a one day "dry run" or dress rehearsal will be conducted. All MEC staff will participate and will carry out their duties and responsibilities as if SP examinations were being conducted. The entire operation of the MEC will be simulated. The purpose of the dry run is to provide the examination staff with an opportunity to practice examinations in the MEC before SP's arrive. Problems which are identified during the dry run will be discussed with the MEC staff, and any additional quality control procedures or operations will be established.

3. **Completing the Dental and Vision Exam Log**

The Dentist or Recorder will go to the Coordinator's station to get the next SP scheduled for a dental and vision exam. The Coordinator will turn over the SP Examination Folder to the Recorder or Dentist and introduce the examinee to him/her. Upon bringing the SP to the

dental examination room, the Dentist or Recorder will enter the SP's name, ID and time in on the Dental and Vision Exam Log. After the examinations have been conducted, the Recorder or Dentist will check off the forms which were completed for the SP and record the time out. If an examination or form was not completed, the reason for the omission must be recorded beside the SP's name. The Dentist or Recorder will then return the SP and SP Examination Folder to the Coordinator. It is the Dentist's responsibility to make sure that the log is kept up and completed properly. (Refer to Section 2.4 for specific instructions on completing the Dental and Vision Exam Log.)

#### 4. Conducting dental examinations and calling exam findings

The Dentist will assume total responsibility for the dental examination itself. As the Dentist is examining the SP, s/he will call out the exam findings for the Recorder to record on the Dental Exam Findings (DEF) data form. These findings are referred to as "calls". Volume II of the Dental Examiners Manual contains specific criteria for determining calls.

#### 5. Verifying recorded calls on the Dental Exam Findings Data Form

After the Recorder has recorded the calls on the DEF Data Form, s/he will edit the form for consistency and completeness. The Dentist must then check over the form to verify that the calls have been correctly recorded. It is for this reason that the Dentist must be familiar with the DEF data form. (Refer to Section 4.2 for specific instructions on filling out the DEF data form.) If a Recorder is absent, a substitute Recorder will be available to record calls. The Dentist should never attempt to conduct an examination and record calls by her/himself as this would almost certainly result in data errors.

#### 6. Completing the Report of Dental Findings

The Dentist will be responsible for completing the Report of Dental Findings after completing each dental examination. Before SP's leave the MEC, the Coordinator will ask if the examinee wishes to have this form forwarded to his/her private dentist or dental clinic. If so, it will be the Coordinator's responsibility to transmit the form. (Refer to Section 4.3 for instructions on completing the Report of Dental Findings.)

#### 7. Sterilizing instruments

It is also the primary responsibility of the Dentist to see that a sufficient number of instruments are sterilized and ready to be used each day. However, this is a time consuming task and it is expected that the Recorder will assist in this task. (Refer to Section 3.3 for specific instructions on sterilizing the instruments.)

## 8. Caring for equipment and supplies

The Dentist will have primary responsibility for rotating the instruments and cleaning the equipment. However, the Recorder is expected to assist in these tasks. (Refer to Section 3.2 and 3.3 for specific procedures on caring for equipment and supplies and rotating instruments.)

## 9. Ordering additional supplies

The Dentist will assume primary responsibility for monitoring dental supplies and for ordering additional supplies. (Refer to Section 3.3 for procedures on replacing instruments and ordering additional supplies.)

## 10. Packing up supplies and equipment at the end of the stand

The Dentist will assume primary responsibility for this task, however the Recorder is expected to assist. As supplies and equipment are packed, materials will be counted and recorded on an inventory sheet. Damaged supplies and equipment must be marked, packed separately and recorded on the inventory sheet so that these will be replaced.

## 11. Conducting the vision examination

The Dentist will be responsible for conducting the MEC vision examination. S/he will also record the findings of the vision exam on the Vision Test form and complete the Vision Section of Report of Findings I. All instructions pertaining to the vision examination are contained in Volume III of this manual.

## 12. Assisting the Coordinator with packing and shipping completed forms at the end of the stand

At the end of a stand each completed dental data form must again be checked off against the Dental and Vision Log and packed in cardboard for shipping to NCHS. Although the Coordinator is primarily responsible for this task, the dentist must assist her/him in this effort. (See Section 3.5 for packing instructions.)

## 2.4 Role of the Recorder

The following tasks are the primary responsibility of the Dental Recorder:

### 1. Participating in the dry run session

As previously discussed in Section 2.3, a one day dry run or dress rehearsal will be conducted before beginning each new stand. All MEC staff will participate and will carry out their duties and

responsibilities as if SP examinations were being conducted. The entire operation of the MEC will be simulated. The purpose of the dry run is to provide the Examination Staff with an opportunity to participate in practice examinations in the MEC before SP's arrive. Problems which are indentified during the dry run will be discussed with the MEC staff and any additional quality control procedures or operations will be established.

2. Recording "calls" on the Dental Examination Findings Form

As the Dentist is examining the SP, s/he will call out the exam findings for the Recorder. The Recorder will record these findings on the Dental Examination Findings Form (DEF). It is the responsibility of the Recorder to record calls. If a Recorder is absent, a substitute Recorder will be available to record calls. The Dentist should never attempt to conduct an examination and record calls by her/himself as this would almost certainly result in data error. (Refer to Section 4.2 for specific instructions on completing the Dental Examination Findings Form.)

3. Editing the Dental Examination Findings Form

Immediately after the dental examination is completed, the Recorder will carefully check over or edit the DEF form for consistency and completeness. Established edit specifications will be followed during the edit process. Editing the DEF form is a primary responsibility of the Recorder although the Dentist will be expected to assist if the Recorder falls behind. After the recorder has conducted the edit, the Dentist must check over the DEF and verify the accuracy of the form to ensure that calls were recorded correctly and completely. The editing and verification procedures will be conducted on each form before the SP leaves the dental examination room. (Refer to Section 4.2 for specific editing instructions for the Dental Examination Findings Form.)

4. Filing completed Dental Examination Forms and transmitting Reports of Dental Findings and Vision Test Forms

The Recorder will transmit all completed Vision Test forms and Reports of Dental Findings to the Coordinator and file completed DEF forms in the dental examination room. Completed Vision Test forms and Reports of Dental Findings will be placed in the SP Examination Folder which will be returned to the Coordinator when the SP is returned to the Coordinator's station. DEF forms are designed for a special data processing method and cannot be clipped into the SP folders. Both blank and completed DEF forms will therefore be stored in the dental examination room. The Recorder is responsible for making sure that there are always blank DEF forms on hand and for ensuring that the completed DEF forms are checked against the Dental and Vision Control Form and filed at the end of each day. (Refer to

Section 4 for specific instructions on completing, storing and transmitting forms).

## **2.5 Role of the Coordinator**

The Coordinator is also considered a member of the dental team. The following tasks are the primary responsibility of the Coordinator:

### **1. Notifying the dental team of examination appointments each day**

At the beginning of MEC operating hours each day, the Coordinator will give a written schedule of the day's SP appointments to the Dental Recorder. The schedule will show the time of the expected SP arrival at the MEC, and the name of the examinee. The Recorder will keep schedules in a convenient central location in the dental examining room. As each examinee is seen by the Dentist the Recorder should check off the examinee's name on the schedule. At the end of each session, the schedule should be checked to insure that all examinees were seen by the dentist. Because of the confidentiality of MEC examination, it is essential that the schedules be kept out of sight of the examinees. The Coordinator has complete authority over the flow of examinees to and from the dental examination room.

### **2. Notifying the Dentist of any special problems regarding the dental team**

Because the Coordinator will be talking with examinees after the examination and will be working with all MEC staff, s/he is likely to become aware of any special problems which may pertain to dental or vision examinations or dental team members. It is the Coordinator's responsibility to notify the Dentist of any special problems regarding the dental examination or team. (Refer to Section 5 for methods of handling special problem situations.)

## Chapter 3

### NON-DENTAL EXAMINATION PROCEDURES

#### 3.1 Equipment and Supplies

Porta-Chair  
Deltube Stool  
Rolux lights, 2  
Plastic sterilization containers, 5  
Explorers, 50  
Mirrors, 50  
Cidex  
Soap  
Light bulbs for Rolux light  
2" x 2" gauze  
Cleanser for basin  
Paper towels  
Rubber gloves  
Masking tape  
No. 2 pencils  
Pens  
Erasers  
Pliers  
Screwdriver  
Allen wrench  
Rubberbands  
Masks  
Alcohol  
Calendars  
Clock  
Kleenex  
Waste basket

#### 3.2 Setting up and Caring for Equipment and Supplies

##### 1. General Rules

You will be arriving at the MEC several days before SP examinations are scheduled to begin. The first day will be spent unpacking, setting up and organizing your equipment and supplies. The second day will be spent participating in the dry run.

Before setting up your examination equipment, investigate the layout of the room and consider several things. The dental equipment must be set up so that the dentist can see what the recorder is recording. The recorder will use the countertop for a hard surface on which to write.

You must set up your equipment and supplies in a manner that is reasonably safe using the following guidelines:

- a. If extension cords are used, they must be taped to the floor so that no one trips.
- b. The equipment must be set up so that examiners and examinees have easy access to and from the room.
- c. The light should be swung away so that the examinees don't bump it getting in and out of the chair.
- d. Cidex bottles should be kept in overhead cabinets or under the counter.

As an additional safety measure, examinees should never be left in the examination room without a dental team member present.

## 2. Porta-Chair

- a. Connect the adjustable back support with the attached quick release pin.
- b. Loosen the height adjustment knob.
- c. Place your right foot on the bottom portion of the right chair leg.
- d. Raise the toe board of the chair with your left hand while lifting the chair leg with the height adjustment knobs up into the slots on the chair frame.
- e. Tighten the height adjustment knobs securely before using the chair.
- f. Adjust the chair back to the desired position. Push the back forward to raise it; pull the adjusting knob out to lower it.
- g. Fold the chair by reversing the above steps.

## 3. Deltube Stool

Since these exams will be conducted with the dentist seated, the stool will be positioned beside the Porta-Chair. You can raise or lower the stool to a comfortable height by pumping the handle under the seat.

The stool is also equipped with a backrest that may be added for additional comfort if desired.



#### 4. Rolux Light

The portable light is pre-assembled and needs only to be connected to the chair and plugged in. 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 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.

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. The maximum intensity position should be used only for short durations to insure maximum lamp life.

The Rolux light is designed to minimize the need to reposition examinees for various 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. Special procedures may require higher light intensity, which may 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 90° at any flexible joint, or broken glass fibers may result, which will reduce light transmission.

To replace the high-intensity light bulb lamp, 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 it 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 that transmit the light. If they are broken light transmission will be reduced. For this reason, care must be taken with the light. Do not throw the Rolux light box away. The light must be packed in the special Rolux

light cardboard box and the arm must be wrapped in styroform, also provided, whenever you are packing up again. Each MEC will have an extra Rolux light on hand as well as extra light bulbs.

## 5. Other Equipment and Supplies

We expect all members of Westat staff to be cognizant of their personal appearance when dealing with survey participants. It is the responsibility of the dental teams to present a clean and neat appearance. Keeping their equipment clean is another responsibility of both the examiner and recorder. Although there are no hard and fast rules in this area, the following recommendations are made:

- a. Examiners will be provided with jackets (two each) to wear when examining SP's. These jackets should be washed frequently enough to keep them fresh and neat.
- b. Placing a clean paper towel on the chair where the examinee's head rests will help to keep this area clean, and eliminate the possibility of having to periodically stop and wipe this area during the exams.
- c. Used instruments are to be placed in basins, out of the direct reach of curious SP's.
- d. Keep the equipment clean by wiping the chair, trays, basin, and table with a damp paper towel or diluted Cidex at the end of the day.

It will be necessary to arrive at the MEC at least 30 minutes before the dental examinations are scheduled to begin. This time will be used to set up the day's supplies. Always stop by the Coordinator's station on your way to the dental examination room to let her know that you have arrived.

Other supplies, explorers, mirrors, 2 x 2's, and towels must also be set up before examinations begin each day. These items should be arranged so that they are easily accessible. On the countertop place the sterilized instruments, 2 x 2 gauze, towels, and two plastic containers in which to put the used instruments. Place mirrors in one container and explorers in the other. A waste basket should be available for used gauze.

### 3.3 Caring for the Instruments

Dentists will have the primary responsibility for sterilizing and rotating instruments and seeing that they are replaced as old ones become worn. The recorder will be expected to help with these tasks. Since the instruments must be dried off before they are used, the sterilization process will take some time.

## 1. Sterilizing Instruments

Mirrors and explorers must be sterilized after being used and kept clean before usage. Being sure that a sufficient number of clean instruments are available for each examination session is the responsibility of the dental team.

The sterilizing agent used for your dental instruments is Cidex. You will be provided with four plastic Tupperware containers to be used for sterilization. Mirrors and explorers must be sterilized in separate containers to prevent the mirrors from being scratched by the explorers.

The following procedures apply to the sterilization process.

- a. Add the contents of the Cidex 7 Activator Vial to the one quart bottle of Cidex. The activated solution will turn green.
- b. Pour the activated Cidex into the plastic Tupperware container. Be careful not to splash the solution on your skin or other objects. Rinse out the Cidex bottle with water before discarding it.
- c. Rinse the used explorers and mirrors to cleanse off any debris.
- d. Put explorers and mirrors into the Cidex for sterilization. These instruments must be immersed completely for a MINIMUM OF TEN HOURS to destroy vegetative pathogens.
- e. On a piece of masking tape, label the plastic container with the date that the Cidex was prepared and the expiration date. This solution will be effective for 14 DAYS. On a second piece of tape, label the time that the instruments were immersed. You must dispose of the Cidex after 14 days and activate a new bottle.
- f. After a minimum of ten hours, remove the instruments using plastic gloves. RINSE THEM TWICE with warm water and a THIRD TIME with steaming hot or boiling water.
- g. Dry the instruments well, particularly the mirrors, with paper towels. Place the instruments on a clean cloth towel and wrap them in groups of about 30 or 35.

## 2. Rotating Instruments

We have planned for you to have 50 sets of instruments in use at one time. It is estimated that you will be using about one-half that many each day for conducting examinations. It is suggested that each team set up an alternating sterilization schedule as described below. This will reduce the time devoted to the activity every day.

On your first day of examinations you will use about 20 sets of explorers and mirrors. That evening, place the used mirrors in one container of Cidex and the explorers in another. (Remember to label the containers).

On the second day you will use the remainder of the unused instruments. That evening, before you leave the MEC, the first set of instruments will be sterilized and ready to be rinsed, dried, and wrapped in clean towels for the next day. The second set of instruments can then be put into the second set of plastic containers with Cidex to be used the day after next.

On occasions you may be examining more than 20 examinees in one day. You will have this information at least a day ahead. In this case, you must be certain that the instruments used the day before are put into the Cidex in the evening so that there will be sufficient time for sterilization. You will need to rinse and dry these extra instruments before the MEC sessions begin.

It is suggested that the mirrors and explorers be prepared in the evening because the dental team may frequently have to be at the MEC by 8:00 a.m. or 8:30 a.m. Rinsing, drying and wrapping these instruments is going to take some time and you want to allow time for breakfast and driving to the MEC. Therefore, unless one member of the team is a very early riser, we suggest performing this task in the evening.

### 3. Replacing Instruments

Since mirrors become scratched and explorer tips become worn over time, mirror and explorer heads must be replaced every 15 weeks. However, most stands will operate for a duration of four weeks and you may find yourself 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 procedure is as follows:

- a. 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 after 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 Coordinator 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.
- b. 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, contact the Field Operations Manager at the stand field office.

- c. Each time the instruments are replaced, the dentist receiving the new shipment must calculate the date 15 weeks after the day that the new instruments are first used and circle that date on the calendar. If a box of mirrors is dropped and the mirrors are broken or some other unforeseen accident happens which necessitates replacing old instruments with new ones, the new instruments must still be discarded on the date circled for discarding the old instruments.

#### 4. ~~Ordering~~ Additional Supplies

From time to time you will need to order additional supplies, such as rubber gloves, masking tape, etc. It is the dentists responsibility to monitor dental supplies and place the orders for additional supplies. It is the recorder's responsibility to monitor the Dental Examination Findings Data Form and to order more DEF Forms when the supply runs low.

To place an order for additional supplies or DEF Forms, you must fill out an Additional Dental Supply Order Form. When placing an order, fill out the box in the upper left corner writing the stand location to which you want supplies shipped, the date that you give the form to the Coordinator and your name. Next, fill out the quantity of item/s that you need. You will see that the form contains an inventory list of all your supplies but there are also blank lines to request items which are not on the list. After filling out the form, give the original to the Coordinator and keep a copy for your records. You must place orders for additional supplies and forms at least ten working days before the day you will need them to ensure time for shipping.

Upon receiving an order, pull your copy of the order form from your file and record the receipt date and your name in the upper right corner. Next, count the items received and record the quantity received beside the item. It is important that you refile your copy of order forms even after you receive a shipment. These forms must be mailed to Mary Masters at Westat at the end of your assignment.

### **3.4 Cleaning Hands**

It is mandatory that the dental examiner clean his/her hands before examining each SP. The dental examination room will be equipped with a sink and running water for washing hands and rinsing instruments. Hand soap will be provided.

We strongly suggest that the dentist keep available a constant supply of hand lotion. Dermassage has been recommended by experienced examiners. Using hand lotion will not only keep your hands feeling "comfortable," but also prevent severe drying and cracking of the skin. If for any reason you have open lesions on your hands, you should wear gloves when conducting the examination.

### **3.5 Packing Equipment and Supplies at the End of a Stand**

The dentist will be responsible for packing up and securing all equipment and supplies at the end of each stand before the MEC trailers are moved. Before the packing is started, the Coordinator will give the dentist a blank inventory sheet. As the packing is done, the equipment and supplies must be counted and recorded on the inventory sheet. You must carefully disassemble the Rolux light taking care not to bend the arm more than 90° at any flexible joint. The light bulb should be removed and the Rolux light packed back in the original box. The mirrors must also be packed carefully so that they do not shift and break during the move. Mirrors can be packed by rolling the instruments up in a towel and then packing the towel. Use newspapers to fill up empty space in any boxes so that items will not shift in the boxes. Be sure to pack the calender showing the replacement date for instruments, in the same box with the instruments. Check all cupboards to make sure that they are empty. Nothing should be left in the cupboards during the move. Do not stack boxes on top of one another because they will shift and fall over during the move.

## Chapter 4

### DENTAL TEAM FORMS AND SPECIFICATIONS FOR THE COMPLETION OF THE FORMS

#### 4.0 Introduction

Before specifications for the completion of individual forms are discussed, it is important to have an understanding of the steps involved in dental and vision examinations and how the forms fit into these steps. The following is an overview of the SP examination process in relation to the dental team.

Upon arrival at the MEC, each SP will check in with the Coordinator who will be positioned just inside the MEC entrance. The Coordinator will put together an SP Examination Folder for each examinee that includes a Vision Test Form, a Report of Physical Findings, a Report of Dental Findings and a Control Record. The Dentist and Recorder will have received a schedule of SP dental and vision appointments for each session during the day. When it is time for an SP's dental and vision appointment, the Dentist or the Recorder will go to the Coordinator's station and meet the SP. The Coordinator will give the SP's Examination folder to the dental team member. Immediately after bringing the SP to the dental examination room, the Recorder or Dentist will record the SP's name, and ID on the Dental and Vision Exam Log and will also record the time in on the Control Form. The Recorder will help the examinee into the dental chair and should say a few words to the SP to put him/her at ease.

The Dentist will then conduct the dental examination and call out the findings. With the arrival of the SP at the dental examination room, the Recorder will have taken a blank Dental Examination Findings Data Form (DEF Form) from a box in the dental room where blank DEF Forms are stored and will have filled in the SP's name and SP number on this form. As the Dentist calls out the dental examination findings, the Recorder will record this information on the DEF Form. After the examination is completed, the Recorder will immediately edit the completed DEF Form and the Dentist will verify the data. The Recorder or Dentist will then initial the Dental and Vision Exam Log indicating that the DEF Form has been completed and will temporarily file the completed DEF Form. S/he will also initial the dental exam on the Control Form and the dentist will complete the Report of Dental Examination Findings Form found inside the SP folder. If the SP is scheduled for the vision test, the Dentist will then conduct the vision exam and record the findings on the Vision Test form. After the vision examination, the Dentist will edit the Vision Test form and fill out the findings of the vision test section on the Report of Physical Findings. Specifications for the completion of forms pertaining to the vision test are found in Volume III of this manual for the dentist. The Dentist or Recorder will then initial the Dental and Vision Exam Log showing that the vision forms have been completed and record the SP time out. The Dentist will also initial the vision exam on the Control Record and note the time out of the dental examination room. The Dentist or Recorder will then return the SP and SP examination folder to the Coordinator.

At the end of each day's sessions, the Dentist will check the session SP schedule against the Dental and Vision Examination Log to make sure that all SP's who were scheduled were seen by the Dentist. If any SP's were missed the Dentist should notify the Coordinator immediately.

#### 4.1 Dental and Vision Exam Log

The purpose of the Dental and Vision Exam Log is to provide dental team members with a record of all dental and vision examinations conducted in the MEC, with a record of all forms completed by dental team members, and with documentation of any examinations which were incomplete or omitted.

Specifications for completing the Dental and Vision Exam Log are as follows:

1. Before the first MEC session each day prepare the control form by writing in the stand name and the day's date.
2. When an SP is brought to the dental room, write in the examinee's name, SP number and the time of the SP's arrival in the dental room. The SP's name and number are to be copied from the Control Record attached to the front cover of the SP folder. The last digit (6th digit) of the Sample Person number will be printed on a sticker. It is essential that you check over the SP number that you have entered on the Dental and Vision Exam Log and on all other forms that you will be completing. The SP number is a six-digit ID number which will later be used to link all data for an examinee.
3. Immediately after the dental examination is conducted and the DEF Form has been edited by the Recorder and verified by the Dentist, the Dentist will write his/her initials in the "DEF" box on the line for the SP just examined. Initials are to be written in again after the Report of Dental Findings is completed, the Vision Test form is completed and the vision section of the Report of Findings I is completed. Sometimes an examination is started but not finished and this is known as a "breakoff." Breakoffs result in partial data on a data form. If you have a breakoff, write "breakoff" across the boxes which you would have initialed if the examination had been completed. You must also write the reason for the breakoff in the comment section on the line for the SP (for example, "excessive bleeding of gums, unable to continue"). The dentist must initial any reasons for exam breakoffs.

Occasionally there may be an SP who will not allow you to conduct the dental or vision examination (refer to Section 5 on problem situations). Whenever an examination is omitted for any reason, the omission must be written in the box which would be initialed if the examination had been conducted and the reason for the omission must be recorded in the comment section (for example, "child frightened, upset"). The Dentist must also initial any reasons for exam omissions.



4. specific criteria and instructions for an Advance Letter), place a check mark in the "Advance Letter" column for the SP. Be sure to then write the reason for the special referral in the comment section of the Log.
5. Just before an SP leaves the dental room, record the time, in the "TIME OUT" box on the line for the SP.
6. At the end of each day, the Dentist will remove the completed DEF Forms from a temporary file where they were stored immediately after the editing and verification process. The Dentist will then check each DEF form against the Dental and Vision Exam Log to ensure that: (1) there is a completed DEF Form for every initialed DEF box; (2) a partially completed DEF Form for every breakoff; and (3) the SP names and numbers correspond between the two forms.

The Dentist will then place the completed DEF Forms in a permanent DEF storage file in the dental room. (See Section 4.4 for specific instructions on filing and packing completed Dental Examination Data Forms.) At the end of each stand, the Dentist will check the data forms against the Log again. The file of Dental and Vision Exam Logs will be sent to Mary Masters at Westat. This file will then provide a record of the status of all MEC dental and vision examinations.

#### **4.2 Control Record**

As discussed in Section 4.1, the Coordinator will fill in the SP Name and Number as well as other information on the Control Record. The SP Examination Folder will then be passed through the MEC examination stations with the SP. The purpose of the Control Record is to provide a complete record of each SP's visit to the MEC, documenting completed examinations and the reasons for any partial or omitted examinations. The Control Record also provides the Coordinator with a means of tracking an SP through the MEC and determining which examinations or interviews need to be conducted.

Specifications for Control Record entries by the Dentist or Recorder are as follows:

1. As you are writing in information on the Control Record you must always enter "lead zeros" if space for two digits is provided but only one digit applies.
2. After you have recorded the SP's "TIME IN" or time of arrival in the dental examination room on the Dental and Vision Examination Log, also record the SP's "TIME IN" on the lines for Dental Exam and Vision Test (if applicable) under Column (3) according to when these exams are started. You will see that there are bracketed codes for data processing later, however these codes are of no concern to you.

3. After a dental or vision examination has been completed and the form boxes on the Dental and Vision Examination Log have been initialed, write your initials in Column (5) on the exam line on the Control Record. If an examination terminated in a breakoff, write the reason for the breakoff in Column (6) on the line for the exam. If an examination was not conducted, write the reason for the omission in Column (6) on the line for the exam. The Dentist must always initial breakoffs and omissions on the Control Record.
4. Record the SP "TIME OUT" of the dental room on the Dental and Vision Examination Control Form. Also record the "TIME OUT" under Column (4) on the line for each exam on the Control Record.

#### 4.3 Dental Examination Findings Data Form

Although it is the Recorder's responsibility to fill out the Dental Examination Findings Data Form in its entirety, the Dentist should also review the specifications found in this section so that s/he can verify the data after the DEF Form has been edited.

The Dental Examination Findings Data Form is used to record the findings of the dental examination. The data processing system planned for the Hispanic HANES dental data is designed to produce detailed analyses of the collected data with minimal time lapse between field examination and final output of results. At the time of the dental examination, information such as the status of each tooth surface is recorded on a specially designed "mark-read form". When received at the National Institute of Dental Research, these forms will be scanned by a Mark-Sense Scanner, which will place the clinical data on magnetic tape, ready for immediate computer processing.

However, because the Dental Examination Findings Data Form is developed for optical scanning, these forms must receive special handling. Wrinkled, folded, torn or smudged data forms or data forms which have been clipped or stapled cannot be read by optical scanning equipment. These damaged forms must be manually read and keyed which results in substantial delays in processing time. Additionally, data forms which have any marks other than data are read incorrectly by the scanner, the scanner interpreting the extraneous marks as data. For these reasons the Dental Examination Findings Data Form cannot be clipped in the SP Examination Folders. Blank data forms will be stored in the dental examination room and the Recorder will take out a blank form at the beginning of each dental exam. Completed data forms must be placed in a file folder and stored in the dental room rather than clipped inside the SP Examination Folder.

The Dental Examination Findings Data Form is central to the Hispanic HANES data collection process. Several aspects of data collection should be considered before specifications for the completion of the form are discussed. There are two sources of error that may enter into a sample survey, sampling error and nonsampling error. The sampling error, error due to making

measurements on a sample rather than on the entire population, can be quantified and is the concern of all statisticians in sample survey design. Of equal importance is nonsampling error which is introduced during data collection and processing. Quality control procedures must be established to minimize nonsampling error. Much time and effort in the Hispanic HANES will be invested in order to reduce this latter type of error and collect data of a high degree of quality. Because examiners may inadvertently introduce variability and bias, all MEC examiners will be trained to conduct examinations and reach findings using standardized procedures and indices. (Refer to Section 6 for a description of calibration, observation and replication.)

Just as uniformity and standardization are important in performing the procedures of the examination, these same two characteristics are vital to recording the observations or measurements which are the result of the procedures. Accuracy and precision again are important, as is legibility. A scrawled entry which cannot be read is no entry at all. It is lost data. Completeness in recording is something that is often overlooked.

We will have unavoidable losses of data, no x-rays on some SP's, inability to obtain optimal performances of some procedures, and so forth. The examining staff are expected to use discretion regarding these unavoidable losses, to stop procedures occasionally when it is apparent that examinees cannot cooperate despite your best efforts. It is the avoidable loss of data that is the responsibility of each staff member to prevent.

Specifications for recording on the Dental Examination Findings Data Form are as follows:

1. General specifications

- a. There are three pages to every Dental Examination Findings Data Form. As previously mentioned, these pages cannot be stapled, paper clipped, or folded together or clipped on the SP Examination Folder or onto a clipboard. The first page is a cover page containing a statement of confidentiality. Do not tear off page 1.

Do not write or mark on any of the pages unless the other two pages are folded down. For example, before recording the SP number in the lower right box labeled "NCHS Sample No." on page 1, fold down pages 2 and 3 so that indentations are not made. Before recording on page 2, fold down page 1 and page 3. If pages are not folded down, a pencil can make indentations in the pages underneath and the optical scanning equipment may read the indentation.

All information is to be entered on the DEF Form by completely filling in the proper marking position with a No. 2 black pencil. If an incorrect entry is made, erase it completely. In

most instances only a single mark will be needed for each tooth. No extraneous marks are to be made on the form at any time. If notation of a special condition must be made, write it on page 2 in the far left margin. Never guess at a call, or try to remember it and fill it in later. Do not hesitate to ask the examiner to go slower or to repeat a call. Accuracy of the data is the most important consideration.

- b. Note that there is a data form number printed in the upper most left corner of page 2 and page 3. Underneath this form number are optical scanning blocks with the inverted form number already printed in. Before you begin to record any "calls," check the printed form numbers on page 2 and page 3 to make sure the form numbers match. Next check the optical scanning blocks to make sure that the marked in form number matches the form number at the top of the page. Remember that the marked in form number has been inverted. If these form numbers do not match, do not use the form. Use another form instead.
- c. Write in the SP name in the box marked "Name" at the top center of page 2 and page 3.
- d. Mark in the SP number in the box marked "Sample Person Number" in the extreme upper left corner of page 2 and page 3. The SP name and number are found on the Control Record as discussed in Section 4.2.
- e. Mark in the SP's age in the box marked "Age" in the upper right side of page 2 and in the name box on page 3. Refer to the Control Record to determine the SP's age.
- f. Mark in the sex of the SP in the box marked "sex" just under the age box on page 2 and in the name box on page 3.
- g. Mark in your dental examiner's number in the box marked "Examiner Number" in the upper center of page 2.
- h. Mark in your recorder number in the box marked "Recorder Number" on the right side of page 2.
- i. At this point you should tell the examiner that you are ready to record calls. The examiner will call out findings for the indexes on page 2 before proceeding with calls for page 3. S/he may begin by reporting whether teeth are present or not present. If teeth are not present in the examinee, mark in the box beside "No Teeth Present" just under the right side of the name box on page 2. If there are no teeth present, the examiner will then give the calls for the "Edentulous Arches Index" and the rest of the indexes will not be called and should not be marked. (Refer to Section 12 for specifications for completing the "Edentulous

Arches Index.) If there is at least one tooth present, leave the "No teeth present" box blank.

## 2. Periodontal Index

The Periodontal Index box is found on the left central side of page 2 of the DEF Form. Notice that there is a column down the middle of the box labeling the types of teeth. Notice also that the mouth has been divided into quarter sections: upper left, upper right, lower left, lower right. The Dentist will conduct the dental examination and call the findings by these quarters; starting with the upper left quarter giving the call for the central incisor, then the lateral incisor, cuspid, first bicuspid etc., until s/he has examined and given the calls for every tooth in the upper left section. As the Dentist calls out these findings, the Recorder will mark in the calls for the upper left quarter, beginning at the top of the column and moving vertically down the left side of the periodontal index box. For example if the Dentist calls out "2" for the upper left central incisor, the Recorder will mark in the "2" in the box marked upper left on the line for the central incisor. The Dentist may then call out "1" for the upper left lateral incisor and the Recorder will mark in the "1" in the box marked upper left on the line for the lateral incisor. Next the Dentist will examine and give calls for the upper right quarter beginning with the central incisor and moving to the back of the mouth to the third molar. The Recorder will record these calls for the upper right quarter by again marking in the calls beginning at the top of the column and moving vertically down the right side of the periodontal index box. This process will be repeated for the lower left and lower right quarters of the mouth.

The codes for the periodontal index are as follows:

None = No positive findings

1 = Mild gingivitis

2 = Gingivitis

6 = Gingivitis with pocket formation

8 = Advanced destruction with loss of masticatory function

9 = Tooth missing

## 3. Oral Hygiene Index

After the Periodontal Index is recorded for all four quarters of the mouth, the Dentist will determine the Oral Hygiene Index to assess the extent of oral debris and calculus. The Oral Hygiene Index box is located on the right central side of page 2 of the DEF Form.

Notice that it is divided into six smaller boxes. Each box is labeled for a tooth; either a molar or a central incisor. These boxes are also labeled for the parts of the mouth: upper left, upper central and lower right. Notice that there are three columns in each box. The central columns are codes for the numbers in the columns on either side. The left columns are for recording calls for debris. The right columns are for recording calls for calculus. The Dentist will conduct the Oral Hygiene Index in one pass through the mouth, giving the debris call first, then the calculus call for each tooth before moving to the next. S/he will examine and give calls in the following order: the upper left molar, the upper central incisor, the upper right molar, the lower left molar, the lower central incisor and the lower right molar.

For the Oral Hygiene Index, upper left molar, the Dentist will normally be giving the call for the upper left first molar. However, if this tooth is missing, the Dentist will substitute using the upper left second molar. For the box marked upper central, the Dentist will normally be giving the call for the upper right central incisor but if this tooth is missing the Dentist will substitute by examining and giving the call for the upper left central incisor. For the box marked upper right molar, the Dentist will normally give the call for the upper right first molar but substitute using the upper right second molar if needed.

When conducting the Oral Hygiene Index for the lower portion of the mouth, the Dentist will normally examine and give the call for the lower left first molar and lower right first molar. Again if these teeth are missing, the second molar will be used as a substitute. Normally the Dentist will examine and give the call for the lower left central incisor but if this tooth is missing the Dentist will substitute using the lower right central incisor.

The Oral Hygiene Index does not have to be marked in any special way if the above substitutes are made.

The codes for the Oral Hygiene Index are as follows:

a. Oral Debris

0 = No debris or stain present. (None)

1 = Soft debris covering not more than the gingival third of the tooth surface, or the presence of extrinsic stains without debris regardless of surface area covered. (1/3)

2 = Soft debris covering more than one-third but not more than two-thirds of the exposed tooth surface. (2/3)

3 = Soft debris covering more than two-thirds of the exposed tooth surface. (2/3+)

9 = Not scored; missing teeth, partially erupted teeth, badly decayed teeth with loss of anatomy, or teeth with orthodontic bands. (NA)

b. Oral Calculus

0 = No calculus present. (None)

1 = Supragingival calculus covering not more than one-third of the exposed tooth surface. (1/3)

2 = Supragingival calculus covering more than one-third but not more than two-thirds of the exposed tooth surface, or when individual flecks of subgingival calculus are present around the cervical portion of the tooth. (2/3)

3 = Supragingival calculus covering more than two-thirds of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth. (2/3+)

9 = Not scored; missing teeth, partially erupted teeth, badly decayed teeth with loss of anatomy, or teeth with orthodontic bands. (NA)

3. Orthodontal Treatment Calls

If the examiner determines that orthodontal treatment is needed or has been conducted, s/he will then give a call for the Orthodontal Treatment Index. If orthodontal treatment is not indicated and has not been conducted previously, the examiner will not give a call for this index and the Orthodontal Treatment Index must be left blank. The Orthodontal Treatment Index is found in the lower right corner of page 2 and has two lines; the upper line for treatment in progress, the lower line for previous treatment. When conducting this index, the examiner will call out whether or not orthodontal treatment is in progress, or whether or not such treatment was conducted previously. Mark in the appropriate word, "yes" or "no", beside the line labeled "progress" or beside the line labeled "previous".

4. Severe Malocclusion Index

The examiner will then call out whether or not the SP has severe malocclusion. The Severe Malocclusion Index is found at the bottom right corner of page 2 of the DEF Form. Mark in the appropriate word, "yes" or "no" in this index.

## 5. Edentulous Arches/Denture Status Index

If the SP is missing all teeth from the upper portion, lower portion or both portions of his/her mouth, the examiner will give a call for the Edentulous Arches/Denture Status Index. This index is found on the right lower corner of page 2 of the DEF Form. Notice that the first line is labeled "upper" for recording the status of upper dentures and the lower line is labeled "lower" for recording the status of lower dentures. The examiner will first state which portion of the mouth the call is for, upper or lower. Then a call will be given indicating whether a denture is absent, present and sufficient, or present but deficient. Mark in the appropriate code as follows:

ABS = Absent

PRES = present and sufficient

DEF = present but deficient

If the SP has any teeth in the upper portion of his/her mouth, the examiner will not give a call for "upper" and you must leave the line for "upper" blank. If the SP has any teeth in the lower portion of his/her mouth, the examiner will not give a call for "lower" and you must leave the line for "lower" blank. Therefore in many cases the examiner will give calls for the Oral Hygiene Index and then give calls for the Orthodontic Treatment Index or the Severe Malocclusion Index. Be sure you are clear as to the part of the mouth being referred to. Also, it might be useful to verify with the Dentist if the Edentulous Arches Index is being skipped so you are sure of where you are on the form.

## 6. Third Molar - Dental Caries and Restoration Index

The Dentist will then begin to examine and give calls for the Third Molar Dental Caries and Restoration Index. This index is found in the lower left corner of page 2 of the DEF Form. Notice that on the extreme left side of the index there are vertical labels for the five surfaces of the teeth:

OCC (Occlusal) - top or biting surface

LIN (Lingual) - surface towards the tongue

BUC (Buccal) - surface outside, away from the tongue, facial surface

MES (Mesial) - surface between teeth (side surface) facing toward front of mouth

DIS (Distal) - the side surface of the tooth facing away from the front of the mouth



Notice also that there is a box for each of the four third molars: upper left, upper right, lower left, lower right. Under these labels there are codes for recording information about the overall status of the tooth. These codes are as follows:

S = Sound tooth, no decay or filling on any surface

U = Unerupted tooth

E = Extracted carious tooth

Y = Tooth extracted for non-carious reason

Below this line, there are columns of codes for recording the status of each tooth surface. The first column of numbers (X), 0, 1, 2, 3 will be used to record decay on one of the tooth surfaces. The second column of numbers (5) 6, 7, 8, 9 will be used to record filled surfaces of a tooth. Note that each code is associated with a particular tooth surface.

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

The third and fourth columns will both be used to record the Dental Restoration Index.

The examination will begin with the upper left third molar. The examiner will proceed to "call" the status of each tooth surface for each of the third molars. Calling of tooth surfaces will consist of

the examiner calling out a numerical digit to the Recorder. The Recorder simply marks in the appropriate status of each tooth beginning with the first box for the upper left third molar and move across the page to the box for the lower left third molar.

As the Dentist examines each tooth, s/he will first determine if one of the codes for tooth calls best characterizes a tooth and if so, s/he will give the tooth call first. If the tooth is permanent with no decay or filling on any surface, the examiner will simply call "S". The Recorder should fill in the appropriate space on the top row of the first box. If the tooth should be characterized by one of the other "tooth calls", the Dentist will call out the appropriate letter and you will fill that in on the top row of the box. If the tooth is permanent with decay on one or more surfaces, the examiner will call the digit(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 digits. The Recorder should black out the appropriate spaces on the Examination Form. If the examiner calls 5, 6, 7, 8 or 9, it means that there is filling on the surface(s) represented by the digit(s) called. This process will continue to the lower right third molar.

**NOTE:** If both filling and decay appear on the same tooth surface, decay will take precedence. Only one entry is to be made for each tooth surface.

After calls for the third molar Dental Caries Status have been given, the Dental Restoration Need Index will be conducted. The Dental Restoration Need Index will be called for each tooth beginning again with the upper left third molar. As the examiner calls the entries the Recorder should black out the appropriate spaces in the second pair of columns (0 through 9) for each tooth. The Dental Restoration Need Index may consist of one or more entries; however, no two entries can be made on the same line. Each tooth will have at least one entry for the Dental Restoration Need Index. Because it is difficult to ascertain the reasons for missing third molars in older subjects, most of the examinees with one or more missing third molars will have to be questioned carefully by the Dentist to ascertain the reasons these teeth are not in eruption, that is, extraction because of caries, extraction for any other reason or impaction. Only third molars extracted for caries should be recorded as "E"; extractions for other reasons are recorded as "Y".

#### 7. Page 3 - Dental Caries and Restoration Index

The Dentist will then begin to examine and give calls for the Dental Caries Index on page 3 of the DEF Form. Notice the vertical labels along the extreme left side of the page showing the same quarters of the mouth as in the Periodontal Index. Also notice the labels along the bottom of the page showing the types of teeth in each portion.

As in the Periodontal Index, each quarter of the mouth begins with the central incisor and goes towards the back of the mouth. Notice, however, that page 3 ends with the second molar. Within the Dental Caries and Dental Restoration Index on page 3, there are 28 boxes, providing a box for each of the 28 permanent teeth. Notice that there are labels for each tooth surface on the left side of the page just as in the Third Molar Index on page 2. With the exception of the incisors and cuspids, each tooth has five surfaces. Incisors and cuspids do not have occlusal surfaces. These surfaces are:

OCC (Occlusal) - top or biting surface

LIN (Lingual) - surface towards the tongue

BUC (Buccal) - surface outside, away from the tongue, facial surface

MES (Mesial) - surface between teeth (side surface) facing toward front of mouth

DIS (Distal) - the side surface of the tooth facing away from the front of the mouth

Also notice that the top line within each tooth box contains codes for recording information about the overall status of the tooth. These codes are as follows:

S = Sound tooth, no decay or filling on any surface

D = Deciduous or "baby" tooth

U = Unerupted tooth

E = Extracted carious tooth

Y = Tooth extracted for non-carious reason

Just as in the Third Molar Index, there are columns below the line of codes for recording the status of each tooth surface. The first column of numbers (X), 0, 1, 2, 3 will be used to record decay on one of the tooth surfaces. The second column of numbers (5), 6, 7, 8, 9 will be used to record filled surfaces of a tooth. The third and fourth columns will both be used to record the Dental Restoration Index.

The examination will begin with the upper left central incisor. The examiner will proceed to "call" the status of each tooth surface for each of the 28 permanent teeth. Calling of tooth surfaces will consist of the examiner calling out a numerical digit to the Recorder. The Recorder will simply mark in the appropriate status of

each tooth beginning with the first box for the upper left central incisor and move across the page to the box for the upper left second molar. Each box on the form represents a tooth. Then record the call for the upper right central incisor and so forth following the same order as was used for the Periodontal Index.

After the calls for Dental Caries status for the 28 permanent teeth have been given, the Dental Restoration Need Index will be conducted for those teeth. The Dental Restoration Need Index will be called for each tooth beginning again with the upper left central incisor. This index must be filled out for every tooth, even if all the teeth have been found to be "sound." As the examiner calls the entries the Recorder should black out the appropriate spaces in the second pair of columns (0 through 9) for each tooth. The Dental Restoration Need Index may consist of one or more entries; however, no two entries can be made on the same line. Each tooth will have at least one entry for the Dental Restoration Need Index.

Note that in some cases, when a second molar is missing, the third molar may move forward filling the gap left by the missing second molar. Also, when a third molar is missing, the second molar may move towards the back. For this reason it is sometimes difficult to tell whether a tooth is a third or second molar. In these situations, the dentist should first query the SP as to which tooth was removed. If the SP doesn't know, the dentist should carefully examine the nomenclature of the tooth to determine whether it is a second or third molar. If the issue is still unresolved after either technique, record "U" or "Y" for unerupted or congenitally missing for the tooth in question.

## 8. Editing the DEF Form

After the dental examination is completed the Recorder must edit the DEF Data Form while the SP remains in the dental chair. The objective of the edit is to ensure that we obtain the best data possible. Inconsistent or missing data are no data, and while imputation procedures can be applied in some instances, there is no substitute for complete and accurate data. Inconsistent or missing data provide misleading information which becomes greatly magnified in the process of inflating the data for national estimates. If caught in time through computer editing procedures, some corrections can be made but the cost of these corrections in terms of time and money is very high. We hope that you will provide every assistance possible in doing a thorough edit.

After the edit has been completed, the dental examiner will check over the Form to verify the data. Once this is done, the Dentist will immediately file the completed DEF Form in a temporary file in order to avoid damage to the Form.

The following edit checks must be conducted on each DEF Form:

- a. The SP number must be correctly marked in on pages 1, 2 and 3.
- b. The SP's name must be written in on page 2 and page 3.
- c. The age must be marked in on page 2.
- d. Sex must be marked in on page 2.
- e. Incomplete or light marks must be completed or darkened with a No. 2 pencil.
- f. Incompletely erased entries must be completely erased.
- g. Extraneous marks must be completely erased.
- h. If the "No teeth present" box is marked in, then the Edentulous Arches/Denture Status Index must have an entry and all other indexes must be blank.
- i. If the Edentulous Arches/Denture Status Index has an entry for the upper portion, then spaces for both upper left and upper right on all other indexes except the Oral Hygiene Index must be blank and the appropriate spaces on the Oral Hygiene Index must be NA.
- j. If the Edentulous Arches/Denture Status Index has an entry for the lower portion, then spaces for both lower left and lower right on all other indexes except the Oral Hygiene Index must be blank and the appropriate spaces on the Oral Hygiene Index must be NA.
- k. If the Dental Caries and Dental Restoration Index indicates a missing tooth, then the Peridontal Index must be 9 for that tooth. If the missing tooth is included in the Oral Hygiene Index, then NA must be marked in for that tooth.
- l. For the Dental Caries Index there should not be multiple marks on the same line in the first two columns of each box. If multiple marks are found on the same line in these columns, consult with the examiner for resolution.
- m. For the Dental Restoration Index there should not be multiple marks on the same line in the last two columns of each box. If multiple marks are found on the same line in these columns, consult with the examiner for resolution.
- n. The age of the SP should be checked against entries in all indexes to insure against an impossible situation, for example, a six year old with a permanent bicuspid. If such a situation is found, consult with the examiner for resolution.

#### 4.4 Packing Dental Examination Data Forms at the End of a Stand

It is primarily the Dentist's responsibility to pack up the Dental Examination Data Forms for shipping to the National Institute of Dental Research. Dental Examination Data Forms for each stand will be packed and shipped in one mailing at the end of each stand. After the forms are packed by the dentist, s/he will then turn the packages over to the Chief Health Technician for mailing to NIDR.

At the end of the first week, the dentist and the Chief Health Technician will set up a permanent file of completed Dental Data Forms which will later be used for shipping. The dentist and the Chief Health Technician will again check the completed Dental Examination Data Forms against the Dental and Vision Examination Log to ensure that there is a completed data form for each dental examination that was conducted. They will then file the completed data forms in numeric order by SP number and fill out an NCHS Transmittal Form, recording the SP numbers of the completed data forms on the transmittal.

At the end of each subsequent week, the dentist and Chief Health Technician will check the week's completed Dental Examination Data Forms against the week's Dental and Vision Examination Log. They will then update the NCHS Transmittal Form in the permanent data form file and insert that week's completed data forms in the file so that the forms are always in numeric order by SP number.

It is essential that the above process or resolution between the completed Dental Examination Data Forms, the Dental and Vision Examination Log, and the NCHS Transmittal Form be conducted at the end of each week. There must be complete resolution between these three forms on a weekly basis. The NCHS Transmittal Form must be updated weekly. Although the process is time consuming, it will greatly reduce problems at the end of a stand when there are hundreds of data forms to account for and many other duties to complete before the stand can be closed.

Instructions for completing the transmittal are as follows:

1. In the upper left box marked "To", print the following:

National Institute of Dental Research  
Ms. Janet Brunelle  
Westwood Building  
5333 Westbard Avenue  
Room 534 Bethesda, Maryland 20816

2. Leave the box marked "Date" blank until the data forms are packaged for shipping. Then record the day's date.
3. Write the stand number.
4. Write in your full name.

5. Write in "Dental Examination Data Forms" and the location of the stand on the first line beginning with "Transmittal." Don't forget to record the state as well as the city name.
6. Write in the date of the first day of dental examinations as the beginning date. Leave the completion date blank until the date the forms are packed. Then record the last day of dental examinations for that shipping period.
7. Next, circle the 3rd, 4th, and 5th digits of each Sample Person Number for each completed Dental Examination Data Form. Do not include the last "check digit" of the 6-digit number. The SP numbers are structured as follows:
 

1st, 2nd digit	=	stand number
3rd, 4th, 5th	=	sample person ID
6th digit	=	random check digit for data processing
8. Count the number of forms and count the circled numbers on the transmittal forms. The circled numbers on the transmittal form must equal the number of completed data forms.
9. Write in the total number of records circled in the space beside "TOTAL NUMBER OF RECORDS." Write in at the bottom of the page the sample numbers of any Dental Data Forms that are missing for any reason. For example, if an SP has received all the examination except the dental exam, his/her sample number should be listed at the bottom of the page with the reason the dental exam was not done.
10. Notice that the NCHS Transmittal Form is printed on three-part NCR paper which has a type of carbon copy behind each page. These copies are distributed as follows:
 

White	To be sent in a <u>separate envelope</u> to Janet Brunelle at NIDR at the same address given at the top of the transmittal form.
Yellow	To be given to the Chief Health Technician in the MEC. The Chief Health Technician will then mail this copy to NCHS Division of Health Examination Statistics.
Pink	To be enclosed in the first package of data forms mailed to NIDR.
11. After the transmittal form has been filled out, divide the completed Dental Examination Data Forms into piles with 100 forms in each pile. Of course the last pile may not contain exactly 100 forms.

12. Package each pile of completed data forms in a separate No. 7 Jiffy bag for shipment to NIDR. Sheets of cardboard must be placed at the front and back of each pile of forms to protect the forms during shipping.
13. In the upper right corner of the transmittal form, record the number of bags being shipped and the SP/ID numbers of the forms contained in each bag.
14. Next, write the bag number on each bag and the total bags; for example, "Bag 1 of 6".

Also, write the range of SP/ID numbers of the Dental Data Forms within the bag on the outside of each bag; for example, "contains 001-102".

A preprinted address label containing the name and address of NIDR must be affixed to the front of the bag. Nylon fiber tape must be used to seal the bag. Do not staple the bag closed because a staple may go through a form. The Chief Health Technician is then responsible for putting the packed Dental Examination Data Forms in the mail.

#### **4.5 Report of Dental Findings**

As discussed in Section 4.1, there is a Report of Dental Findings in the SP's Examination Folder. This referral form will routinely be completed and mailed out for every SP within 6-8 weeks. The purpose of the Report of Dental Findings is to notify an examinee's dentist or dental clinic about the findings of the MEC dental examination. If an examinee does not have a private dentist or go to a dental clinic, the examinee will be given the name and address of a community dental clinic and the Report of Dental Findings will be sent to the clinic where the SP was referred. The Dentist must complete the Report of Dental Findings. Specifications for completing the Report of Dental Findings are as follows:

1. In most cases the Coordinator will have filled out the top section of the Report of Dental Findings. This top section contains the SP's name, address, age and the date of the MEC examination. Always check the top section of the form to make sure it has been completed. If it is not, the Dentist must write in the information. The SP's name and age can be copied from the Control Record, however, the SP will then have to be asked for his or her address. The date of the dental examination must also be recorded on the right side of the top section.
2. Check the appropriate box or boxes which indicate the dental examination findings.



In a large number of cases you will simply need to check the first box which indicates that an SP should simply continue regular dental care. However, because of the failure to seek care at the appropriate time there will be some examinees with conditions which should be brought to the attention of his/her dentist either immediately or in the near future. In this case you would check the box that indicates a visit should be made before the next regular appointment as well as one of the boxes indicating what problems were observed. The following guidelines should be useful in forming a judgment about the need for an oral examination at some time before the next regular appointment:

1. Inquire about current or pending treatment to avoid an inappropriate recommendation for early examination.
2. Do not recommend early examination for any conditions which the dentist has under surveillance or for treatment of primary teeth which will likely exfoliate before causing trouble.
3. Early examination may be indicated when:
  - a. There is the possibility of infection through a deep carious lesion which involves or likely involves the pulp.
  - b. There are unsalvageable permanent or primary teeth.
  - c. There is spontaneous bleeding from the gingival crevice or pocket with or without heavy soft and/or hard deposits.
  - d. There are teeth with more than normal mobility.
  - e. There is a severe malrelationship which interferes with functions and/or causes unacceptable esthetics and which is likely unknown to the dentist.

#### 4.6 Advance Letter of Findings

Although a Report of Dental Examination Findings is routinely sent for every SP within 6-8 weeks after the examination, sometimes a more serious condition is found which requires earlier treatment or treatment within the next 30 days. A serious condition requiring early treatment (Level II) is defined as follows:

Major dental findings that warrant attention by a health care provider within the next 30 days because they are expected to cause adverse effects within this time period and they have previously been undiagnosed, unattended, nonmanifested or not communicated to the examinee by his/her personal health care provider.

We do not expect that this letter will have to be sent very frequently. However, if a condition meeting the above criteria is found, the MEC dentist must fill out the Advance Letter of Findings and must follow these procedures:

1. Explain to the SP the general concern about the condition. The condition must be communicated to the SP in general terms which impress upon him/her the importance of receiving early treatment. At the same time however, the SP should be told that final diagnosis can only be made by the SP's regular health care provider.
2. The SP should be asked to make an appointment in the next 2-3 weeks with his/her regular dentist or physician.
3. The form giving permission to send MEC examination findings must be checked to make sure that it has been signed by the SP.
4. The Advance Letter of Findings must then be filled out and mailed to the SP's regular dentist or physician. The MEC dentist or physician who fills out the letter is responsible for mailing the letter. A copy of the completed letter must be filed in the Dental and Vision Exam Log file.
5. A check mark must be placed in the "Advance Letter of Findings" column on the Dental and Vision Exam Log on the line for the SP and the reason for the referral letter must be given in the comment section.
6. If the SP has no regular health care provider, the Coordinator must show the SP a list of referral sources and ask the SP to designate one. The Coordinator must then give the SP the name, address and telephone number of the designated health care provider.
7. The MEC dentist or physician, at his/her discretion, may call the SP's health care provider to alert him or her to the SP's condition. However, with the conclusion of the above procedure, the MEC dentist's or physician's role in the SP's case is over since further involvement tends to interfere with the functioning of the MEC and is ineffective as far as helping the SP.
8. The dentist must write a brief notation of the findings on page 13 of the Physicians Data Form and record "Dental - Type II" beside it.
9. The dentist must also verbally notify the physician of any Level II condition before the examinee leaves the MEC so that the physician can code the condition using ICD codes.

## Chapter 5

### PROBLEM SITUATIONS

#### 5.1 Post-Examination Complaints

Although the dental examination is simple, it can be anticipated that some examinees will have post-examination complaints. These complaints might include a claim that the Dentist knocked out a filling, or that the examination resulted in a toothache or bleeding gums. Some of these complaints may be real for if the sample person's teeth and gums are in poor condition, the examination may cause a toothache or bleeding gums. It is also possible that a temporary filling could become dislodged. In other cases, the claim may have no basis. However, it is necessary to respond immediately to any such complaint, real or imagined.

Some of these complaints can be anticipated and therefore, prevented. For example, during the examination, if the gums start to bleed enough that you think that the SP will notice, inform the person that his/her gums are bleeding a little but there is no reason to worry. If a tooth is badly decayed, use your judgment and avoid causing pain.

We expect that most of these complaints will be lodged shortly after the examination while the sample person is still in the MEC. Other MEC team members, particularly the Coordinator, may first become aware of the complaint and should immediately inform the dentist about the situation. It is also expected that most of these complaints can be handled by reinspecting the mouth and discussing the problem with the examinee.

If it turns out that the problem is more severe (such as a dislodged filling) and cannot be handled by a brief examination and explanation, immediately call Mary Masters at Westat and the Field Operations Manager at your stand.

#### 5.2 Upset Examinees

It can also be expected that some examinees will become frightened at the prospect of the examination. In general, the handling of this situation should be based on your own good judgment. If the SP is just mildly nervous, let him/her watch while another SP is examined. A technique which is particularly effective with young children, is to seat the child on an "on deck" chair where s/he can see what is happening while another child is being examined. Chances are, as a child sees his/her peers braving the examination, s/he will also want to participate.

If you encounter a child (or adult) who has apparently decided not to participate and is demonstrating the decision in a disruptive manner (as in a tantrum), it is advisable not to persist. In fact, if the person is behaving in such a manner that s/he is disruptive to the other examinees, it is best to

have this SP taken back to the Coordinator, as this type of behavior is sometimes contagious.

### **5.3 Sick Examinees**

It is recommended that examinees who are obviously ill, particularly if they have a fever, not be examined. If you feel that an examinee has a fever or is too ill to be examined, the Coordinator should be notified. The reason that the SP is not examined should be noted on the Control Record and on the Dental and Vision Control Form so that both you and the Coordinator have a record as to why the dental or vision examination was not conducted.

We do not feel that the common cold should exclude an SP from participating. However, the examiner may choose to wear a face mask during the examinations, and this is permissible.

If an examinee has open sores around the mouth area, it is advisable to wear plastic gloves which will be provided. If you feel it is necessary to put on gloves, quietly explain the reason to the SP. Try to handle the situation with some discretion so as not to embarrass the participant.

### **5.4 Handicapped SP's**

It can be expected that handicapped SPs will fall into the sample. As a rule, this should not be a problem except in the following situations:

If an SP is emotionally disturbed and badly frightened by the exam, you should not be persistent in attempting to persuade him/her to participate.

SP's in wheelchairs can be examined in the wheelchairs.

In the first situation the Coordinator will notify you in advance that the SP has a problem and may provide information as to how to proceed.

### **5.5 Medical Emergencies**

We do not expect that a medical emergency will occur as a result of the examination. However, should something occur while the SP is participating in the survey, the dental team must immediately notify the MEC Physician or Nurse. This does not mean treating the emergency, but knowing where to go to get assistance. In such a situation, one member of the team would remain with the SP while the other member goes for help. If the MEC Physician and Nurse are not in the MEC, an ambulance should be called after obtaining permission from the examinee. If the examinee refuses to give oral consent, the dentist should ask an available MEC staff member to serve as a witness while the

dentist tries to convince the examinee of the seriousness of the situation. If the examinee still refuses, the dentist should terminate the MEC examination and have the examinee leave the center expeditiously. In case of a medical emergency, a brief notation of the emergency must be written on page 13 of the Physician's Data Form and "Dental - Type II" must be written beside it.

## **5.6 Dental Team Illness**

If a member of the dental team becomes so sick that s/he is unable to work, notify the Coordinator and Mary Masters at Westat as soon as possible. We will attempt to provide a temporary replacement for this person.

If the team examiner contracts an illness which is contagious but not totally debilitating (such as a common cold), we request that you wear a mask during the examinations as a courtesy to the examinees.

## Chapter 6

### QUARTERLY OBSERVATION, REPLICATION AND RECALIBRATION

As previously discussed, the mission of the MEC team members is to collect data on the health and nutritional status of sampled persons in the selected stands. Since all data from all examiners will be pooled or grouped together during the data analysis period, it is essential that there be minimal differences between examiners with respect to procedures used and interpretation of signs. In carrying out the mission it is therefore essential that the methods of data collection be as uniform as possible across stands. Probably the most important factor in obtaining uniform data is that the indices used to obtain examination findings be applied in a uniform manner by the various examiners throughout the survey. To achieve this standardization, a series of dental examiners' calibration sessions will be conducted during training. Volume II of the Dental Examiners Manual is the Manual for Calibration and contains descriptions and discussions of the various indices used to assess the disease state.

#### 6.1 Quarterly Observation and Replicate Examinations

At the conclusion of the dental examiners' training for this study, all dentists will be calibrated. It is expected that dental examiners will periodically review the Calibration Manual throughout the field period. However, it has been found that some degree of deviation from standards or "drift" does occur over time no matter how diligently the examiner guards against this. Therefore, in order to measure the degree of "drifting" and to determine whether recalibration is necessary, each Dentist will be periodically observed while s/he is conducting examinations and the examinations will be replicated by another dentist who is calibrated. Observation and replication will be conducted on a quarterly basis throughout the pretests and main study field periods.

#### 6.2 Recalibration

At the conclusion of replication if it is found that major differences in applying the study criteria exist, the Dentist will be recalibrated until resolution of differences occurs.

Recalibration of the dental examiners will be carried out by region, or other NIDR designated interval. Dr. Charles Donnelly, Senior Staff Dentist, Westat; and Dr. Ann Miller, National Caries Program, NIDR, will be recalibrating the examiners in the field.

The Dental Recorders will also be restandardized at periodic intervals by NCHS staff and Westat staff as needed.

**DENTAL EXAMINER'S MANUAL**

**Volume II - Specifications for Calibration**

## THE PERIODONTAL INDEX (PI)

Scores are assigned according to these criteria:

- 0--- Negative. There is neither overt inflammation in the investing tissues nor loss of function due to destruction of supporting tissues.
- 2--- Mild gingivitis. There is an overt area of inflammation in the free gingivae, but the area does not circumscribe the tooth.
- 2--- Gingivitis. Inflammation completely circumscribes the tooth, but there is no apparent break in the epithelial attachment.
- 6--- Gingivitis with pocket formation. The epithelial attachment has been broken and there is a pocket (not merely a deepened gingival crevice due to swelling in the free gingivae). There is no interference with normal masticatory function; the tooth is firm in its socket and has not drifted.
- 8--- Advanced destruction with loss of masticatory function. The tooth may be loose; may have drifted; may sound dull on percussion with a metallic instrument.

RULE: When in doubt, assign the lesser score.

Each tooth present in the mouth, unless it is a root, was scored, and the arithmetic average of all scores was the individual's PI.

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NOTE: The "9" code will be used to signify unerupted teeth, missing teeth, or remaining roots.



## SLIDES FOR TRAINING EXAMINERS ON THE PERIODONTAL INDEX

### Slide 01: Normal dentition score = 0

Each tooth in the dentition is individually scored using an unmarred, non-magnifying, front surface mirror and proper illumination. If there is neither overt inflammation in the investing tissues nor loss of function due to destruction of supporting tissues, a score of 0 would be assigned.

### Slide 02: Gingivitis score = 1 or 2

For each of the upper and lower incisors, shown on this slide, if there is an overt area of inflammation in the free gingivae, but the area does not circumscribe the tooth, the score for the individual tooth would be a 1. If the inflammation completely circumscribes the tooth, but there is no apparent break in the epithelial attachment, then a score of 2 would be assigned.

### Slide 03: Gingivitis with pocket formation score = 6

04:

Looking at each central incisor on the next two slides, if the epithelial attachment has been broken and there is a pocket (not merely a deepened gingival crevice due to swelling in the free gingivae), and there is no interference with normal masticatory function; and the tooth is firm in its socket and not drifted, then scores of 6 would be assigned.

### Slide 05: Advanced destruction score = 6 or 8

06:

If advanced destruction with loss of masticatory function is evident, the individual tooth may be loose; may have drifted; may sound dull on percussion with a metallic instrument, then a score of 8 is assigned. If in doubt the lesser score of 6 would be assigned.

Missing teeth or roots score = 9

On the same final slides, scores of 9 would be assigned to the missing upper teeth and retained roots.

## THE SIMPLIFIED ORAL HYGIENE INDEX (OHI-S)

Selected surfaces of six teeth were used in making this estimation of oral hygiene status. For the purposes of this examination each surface that was used, buccal or lingual, was considered to encompass half of the circumference of the tooth. The buccal surface of the molar, for example, was considered to include half of the mesial surface and half of the distal.

On both sides of the arch the posterior tooth assessed was the most anterior, fully erupted permanent molar, or, in its absence, the most distal fully erupted primary molar. In most cases, this was a first permanent molar; in other cases it was a first or second primary molar or a second permanent molar. The buccal surfaces of upper molars and the lingual of lower molars were examined. In the anterior portion of the mouth, the labial surfaces of the upper right central incisor and the lower left central incisor were examined. When these teeth were missing, only the adjacent central incisor was examined.

### 1. Examining for oral debris

The surface area covered by debris was estimated by running the explorer along the surface being examined and noting the occlusal or incisal extent of the debris as it was removed from the tooth surface and adhered to the explorer.

Scores were assigned according to the following criteria:

0---No debris or stain present.

1---(a) Soft debris covering not more than the gingival third of the tooth surface, or (b) the presence of extrinsic stains without debris regardless of surface area covered.

2---Soft debris covering more than one-third but not more than two-thirds of the exposed tooth surface.

3---Soft debris covering more than two-thirds of the exposed tooth surface.

### 2. Examining for oral calculus

The explorer was also used to estimate the surface area covered by supragingival calculus and to probe for subgingival calculus.

Scores were assigned according to the following criteria:

0---No calculus present.

1---Supragingival calculus covering not more than one-third of the exposed tooth surface.

2---Supragingival calculus covering more than one-third but not more than two-thirds of the exposed tooth surface, and/or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth.

3---Supragingival calculus covering more than two-thirds of the exposed tooth surface and/or a continuous heavy band of subgingival calculus around the cervical portion of the tooth.

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**NOTE:** The "9" code will be utilized for missing teeth, partially erupted teeth, badly decayed teeth with loss of anatomy, or teeth with orthodontic bands.

SLIDES FOR TRAINING EXAMINERS ON THE OHI-S

Slide 01: Debris and Calculus Score = 0  
(375)

No debris or stain is present, and no calculus is present.

Slide 02: Debris score = 1  
(380)

(a) Soft debris covers not more than the gingival third of the tooth surface, or (b) extrinsic stains are present without debris regardless of surface area covered.

Slide 03: Debris score = 2  
(381)

Soft debris covers more than one-third but not more than two-thirds of the exposed tooth surface.

Slide 04: Debris score = 3  
(382)

Soft debris covers more than two-thirds of the exposed tooth surface.

Slide 05: Calculus score = 1  
(373)

Supragingival calculus covers not more than one-third of the exposed tooth surface.

Slide 06: Calculus score = 2  
(374)

Supragingival calculus covers more than one-third but not more than two-thirds of the exposed tooth surface, and/or individual flecks of subgingival calculus are present around the cervical portion of the tooth.

Slide 07: Calculus score = 3  
(376)

Supragingival calculus covers more than two-thirds of the exposed tooth surface and/or a continuous heavy band of subgingival calculus is present around the cervical portion of the tooth.

Slide 08: Upper right central = 0/0  
(3)

Looking at the upper right central, if no debris, stain or calculus are present then both debris and calculus scores would be 0's.

Slide 09: Upper right central = 1/0  
(65)

Looking at the upper right central, it appears that there is soft debris covering not more than the gingival third of the tooth surface. Therefore, the debris score would be 1. The calculus score appears to be 0. It is important for the examiner to use the explorer for the actual determination of both the debris and calculus scores.

Slide 10: Lower left central = 2/2  
(60)

Looking at the lower left central, it appears that the debris might extend more than one-third but not more than two-thirds of the tooth surface. A score of 2 would be assigned for debris. For calculus, if subgingival flecks can be detected with the explorer, then a score of 2 would be assigned for calculus.

Upper right central = 3/(1-3)

On the same slide, looking at the upper right central, if soft debris covers more than two-thirds of exposed tooth surface, then a score of 3 is given. For calculus, if all one can find is supragingival flecks, the score is 1. If flecks extend sub-gingivally, then a score of 2 is given. If there is a complete ring of calculus subgingivally, then a score of 3 is assigned. A score of 2 appears most likely here.

#### Recession

In the case of recession, such as illustrated on the lower right cuspid, the tooth is divided into thirds using the total exposed labial surface. If this were a tooth to be scored, it appears that both debris and calculus extend to the incisal third. Therefore, a score of 3 would be assigned to both debris and calculus.

## ORTHODONTIC TREATMENT STATUS

### TRAINING OF EXAMINERS

The orthodontic treatment status is to be recorded for all examinees regardless of age.

#### 1. Orthodontic treatment in progress

The examiner is to determine if orthodontic treatment is currently in progress by visual observation of the examinee's mouth. All orthodontic appliances, including space maintainers or retainers, are to be coded as a Yes on the data form.

#### 2. Previous orthodontic treatment

The examiner is to determine if the examinee has had previous orthodontic treatment. Each person will be asked to respond to the following question:

HAVE YOU EVER HAD YOUR TEETH STRAIGHTENED OR HAD BANDS PUT ON THEM?

The examiner should then determine if the examinee really understands the question before coding a "yes," "no," or "don't know" for the response.

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**NOTE:** If in the professional judgment of the examiner a severe malocclusion is present, yes will be indicated in the appropriate box. All others will be coded no.

## EDENTULOUS ARCHES DENTURE STATUS

No entry was made in this section unless at least one arch was edentulous. An arch with erupted or partly erupted teeth was considered edentulous if a full denture was being used.

### Absent

No teeth (or roots) were present in the arch and the examinee did not have a denture either in his mouth or on his person at the time of examination.

### Present

A denture was present in the mouth and not defective at the time of examination.

### Defective

There is visible evidence that the denture was causing extensive destruction of the primary stress bearing areas of the ridge or palate. Tissue in these areas may have been acutely inflamed; bone resorption may have occurred; hypertrophied tissue may have been present. The denture was also defective if it was in the possession of the examinee at the time of the examination but not in the mouth.

## STATUS OF THIRD MOLARS

The status of the third molars will be recorded using the following criteria for the DMF index:

The examination of third molars for dental caries status is done immediately before the basic caries prevalence form is completed (for the rest of the dentition). The findings are recorded in the lower left section of the HHANES form. The third molars are examined in the same sequence as the quadrants of teeth will be surveyed for caries, i.e., upper left, upper right, lower left and lower right.

The same criteria for caries, fillings and extractions apply to third molars as for other teeth in the mouth. Because it is difficult to ascertain the reasons for missing third molars in older subjects, most of the examinees with one or more missing third molars will have to be questioned carefully to ascertain the reasons these teeth are not in eruption, that is, extraction because of caries, extraction for any other reason or impaction. Only third molars extracted for caries should be recorded as "E"; extractions for other reasons are recorded as "Y".



## DMF AND DF INDEX

### Discussion of Diagnostic Criteria Presented at Examiner Training Session by Dr. Swango

In carrying out this survey it is intended that the methods of data collection be as uniform as possible among the sites sampled. Probably the most important factor in obtaining uniform data is that the indices used to assess the disease state, which in this case are the DMF surface index for permanent teeth and the DF surface index for deciduous teeth, be applied in a uniform manner by the various examiners throughout the entire survey. In working to achieve uniformity the examiners should be thoroughly familiar with the written criteria for diagnosing carious lesions, for determining whether lesions or restoration extend onto additional tooth surfaces, for determining the status of eruption of teeth and for determining the conditions for which certain teeth should be excluded from the analysis.

Today I am going to describe for you the diagnostic criteria that we would like for you to use during the examinations. After describing these criteria we will show a series of slides which will serve to illustrate the use of the criteria. These are similar to the criteria that we use in the Community Programs Section for carrying out clinical investigations of cariespreventive agents. The diagnostic criteria for caries are, with one or two exceptions, those adopted by the Caries Measurement Task Group, Conference on Clinical Testing of Cariostatic Agents, sponsored by the American Dental Association in 1968. Before going into the discussion of the criteria, I would like to say that we are well aware that it is not possible to fully standardize you to these criteria by merely discussing the criteria and illustrating them with slides. Therefore, following this presentation we will work with you in conducting clinical examinations on a number of people, including a number of duplicate examinations, and discuss any differences in interpretation. This will certainly serve to improve the degree of standardization. We feel confident that by the end of this training session you will feel comfortable with these criteria and hopefully will have reached an acceptable level of standardization.

I'd like to describe first the criteria for diagnosing caries. Carious lesions may be categorized into two types: frank lesions and incipient lesions. Frank lesions are detected as gross cavitation and thus present few problems in diagnosis. Incipient lesions, on the other hand, are less obvious and therefore more difficult to diagnose consistently. Incipient lesions may be subdivided into three categories according to location, each with special diagnostic considerations. The categories are:

- A. Pits and fissures on occlusal, buccal and lingual surfaces: These areas are carious when the explorer catches after insertion with moderate to firm pressure and when the catch is accompanied by one or more of the following signs of decay:

- (1) Softness at the base of the area.
- (2) Opacity adjacent to the area providing evidence of undermining or demineralization.
- (3) Softened enamel adjacent to the area which may be scraped away with the explorer.

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

B. Smooth areas on labial, buccal 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:

- (1) Penetration with the explorer.
  - (2) Scraping away the enamel with the explorer.
- These areas should be diagnosed as sound when there is visual evidence of demineralization, but no evidence of softness.

C. Proximal surfaces: For areas exposed to direct visual and tactile examination, as when there is no adjacent tooth, the criteria are the same as those just presented for smooth areas on facial or lingual surfaces.

For areas not available to direct visual-tactile examination, the following criterion applies: a discontinuity of the enamel in which the explorer will catch is carious if there is softness. In posterior teeth, visual evidence of undermining under a marginal ridge is not acceptable evidence of a proximal lesion unless a surface break can be entered with the explorer. In the anterior teeth, however, 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 labio-lingually and reflects into the mirror. If a characteristic shadow or loss of translucency is seen on the proximal surface, then this is suggestive that a carious lesion is present on that surface. Ideally, the actual diagnosis of the lesion should be confirmed with the explorer by detecting a break in the continuity of the enamel surface. However, a clear visualization of a lesion by transillumination can be accepted as a positive diagnosis.

The M component of the DMF surface index represents those permanent teeth that have been extracted as a result of caries. It is essential, of course, to distinguish between teeth extracted or missing for other reasons such as trauma, orthodontics or periodontal disease. There is no "extracted due to caries" designation for deciduous teeth. Any deciduous tooth extracted for

caries, and for the sake of consistency, any deciduous tooth missing for any reason will be recorded as "permanent unerupted" and coded as a U so long as the permanent successor has not appeared.

The F component of the DMF and df indices simply stands for any tooth surface that has been filled, with either a permanent or temporary filling, as a result of carious involvement. Here also it is necessary to distinguish between surfaces restored for caries and those restored for other reasons such as trauma, hypoplasia or malformation.

In applying the DMF and df indices, there are several special conditions that require additional explanation:

1. Teeth restored with full coverage -- If a permanent tooth bears a full crown restoration, the examiner must try to determine the reason the crown was placed. If the restoration was required because of caries, the tooth will be coded as all surfaces filled (5,6,7,8,9, on posterior, or 6,7,8,9 on anterior teeth). If the restoration is due to a fractured, malformed, or hypoplastic tooth, the tooth is scored Y.

NOTE: This rule applies only to permanent teeth with full crowns or jackets. If a fracture, for example, has been restored with anything less than full coverage, all surfaces not involved by the restoration will be examined and scored in the usual manner. Deciduous teeth with full coverage (stainless steel or polycarbonate crowns) will always be scored as all surfaces filled, since these teeth are seldom crowned for any other reason.

2. Banded or bracketed teeth -- All visible surfaces are to be examined as well as possible and scored in the usual manner.
3. Teeth extracted for orthodontic reasons -- Certain teeth, typically first bicuspid, may have been extracted as part of orthodontic treatment. These teeth are scored as Y. The examiner must make the determination that the teeth were extracted for orthodontic reasons rather than caries, although this is not usually difficult because of the typically symmetrical patterns of such extractions. Rather than trying to determine whether the extracted teeth are 1st or 2nd bicuspid, we have adopted the convention of calling them 1st bicuspid. Teeth other than bicuspid may also be extracted for orthodontic reasons. In many cases the subject will have good recall of the reason for the extraction, and can help the examiner in making the correct determination.
4. Non-vital teeth -- Non-vital teeth are to be scored in the usual manner. If in your opinion a restoration on a non-vital tooth was placed solely in order to seal a root canal filling and not for caries, that restoration will not be scored.

5. Hypoplastic teeth -- These are to be scored in the usual manner. However, if you can determine 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, as described in condition 1 above.
6. Malformed teeth -- Score in the usual manner, unless restored with full coverage for esthetic reasons, in which case the tooth is coded Y.
7. Congenitally missing teeth -- If you can determine that the tooth is congenitally missing rather than unerupted, score the tooth Y.
8. Extracted or missing due to trauma -- Scored Y for permanent teeth and U for deciduous.

There are a number of general considerations regarding criteria and other examination procedures that I would like to outline for you:

1. Stain and pigmentation alone should not be regarded as evidence of decay since either can occur on sound teeth.
2. A tooth is considered to be in eruption when any part of its crown projects through the gum. This criterion is, of course, easier to standardize on than one which calls for a more advanced stage of eruption.
3. In the case of supernumerary teeth, only one tooth is to be called. It is up to the examiner to decide which tooth is the "legitimate" occupant of the space.
4. Where both a deciduous and a permanent tooth are erupted into the same tooth space, only the permanent tooth is to be called.
5. Third molars are not included in the survey and there is no space provided for them on the examination form. When examining second molars it is important to note that a third molar may occupy a second molar space because of anterior drifting. If it can be determined that this has occurred, the diagnosis and call must relate to the status of the missing second molar, not the drifted 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 E and the third molar is not scored.
6. When a crown is destroyed by caries and only the roots remain, this is recorded as "all surface carious."
7. When a tooth is carious and filled on the same surface, call the surface carious. In other words, caries takes priority over a filling.

8. When an adhesive sealant is present in a pit or fissure, and if there is no evidence of caries according to criteria previously described or if there is no restoration present, that surface would be considered sound.
9. When a filling or a carious lesion on a posterior tooth extends beyond the line angle onto another surface, then the other surface is also called carious or filled. However, a proximal lesion or filling on an anterior tooth is not considered to involve the adjacent lingual or labial surface unless it extends at least 1/3 of the distance to the opposite proximal surface.
10. For the purposes of the survey, incisal edges of anterior teeth are not considered as separate surfaces and are not represented as such on the data collection forms. If a lesion or restoration is confined solely to the incisal edge it should be scored as involving the nearest adjacent surface.
11. An effort should be made to examine each subject in the same manner. For example, an examiner should avoid the temptation to examine a subject more thoroughly who appears to be highly susceptible to caries. Also, it is well to systematize the examination procedure and to follow the same system for each person. The exam forms are set up so that one must start with the upper left central incisor and proceed distally through the second molar. The same procedure is followed in sequence for the upper right, lower left and lower right quadrants. As an aid to consistency, each quadrant should be dried with compressed air prior to examination. It is also helpful to establish a systematic approach to examining each individual tooth. One approach is to examine the surfaces in the following order: lingual, labial, mesial and distal for the anterior teeth and occlusal, lingual, buccal, mesial and distal for the posterior teeth. These orders are logical in that they correspond with the sequence displayed on the examination forms. It is not advisable to call out the code for each surface as that surface is examined. This is confusing to the recorder. It is better if the examiner accumulates the diagnostic codes in his mind for a given tooth until all surfaces have been examined before dictating the calls to the recorder.

## SLIDES FOR TRAINING EXAMINERS ON THE DMF AND DF EXAMINATIONS

### Slide #01: Instruments for DMF Examination

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

### Slide #02: Placement of Recorder

The recorder should be placed in such a position that he/she can hear the examiner clearly.

### Slide #03: Illustration of Transillumination

The placement of the light source will be an important consideration for the dental examiner. If the portable or fixed light source is properly placed, subtle adjustments of the mouth mirror should allow for transillumination from a lingual aspect of approximal surfaces of anterior teeth and posterior areas that are difficult to see with direct lighting.

### Slide #04: Upper Deciduous Dentition

This is an apparently caries-free, maxillary, deciduous dentition. You will note the primary centrals, laterals, cuspids and first and second molars are in place.

### Slide #05: Lower Deciduous Dentition

The primary incisors, cuspids and molars are in place in the mandibular arch.

### Slide #06: Lower Mixed Dentition

This slide shows a lower mixed dentition with the permanent central and lateral incisors and first molars in place. Notice the mammelons on the newly erupted central and lateral incisors.

### Slide #07: Sealants

This is a permanent dentition. You will note sealants present on the occlusal surfaces of the bicuspid. If there is no evidence of caries or restoration, the occlusal surfaces would be considered sound.

### Slide #08: Stained Developmental Grooves

On this slide, notice the bicuspid appear to be free from decay. Deep staining occurs on the first permanent molar. The condition of the second permanent molar cannot be seen because of the cheek. All of the teeth in this mouth should be probed even if they appear to be sound. On your charting form

all of the teeth would be indicated with the single letter S unless caries was detected on probing.

Slide #09: Erosion

This is a permanent dentition. The labial surface of the lateral incisor appears to show erosion. If the eroded area is found to be soft by penetration with the explorer or by scraping away of enamel with the explorer then the area would be considered carious.

Slide #10: Recurrent Caries

These are deciduous teeth. There appears to be a MOD on the first primary molar and an occlusal restoration and recurrent caries on the second primary molar. On your charting form, the MOD, if sound, would be indicated as a D589. The second primary molar would be indicated as a DX to indicate that caries is present. In recording, a carious lesion always takes priority over a restoration.

Slide #11: Fractured Restoration

This slide shows an example of a fractured restoration. The second deciduous molar would be indicated on the recording form as a DX38 if decay is present on the occlusal and distal surfaces. If non-carious the tooth would be marked as an MOD restoration, ie, D589. If the surface has been restored but the restoration is missing, this surface would be coded as carious.

Slide #12: Extensive Caries

These are permanent teeth. (A cotton roll is shown; cotton rolls, however, are not used when making clinical examinations.) Only the root remains of the first permanent bicuspid, part of the buccal surface remains of the second bicuspid, roots remain of the first permanent molar. On your charting form, first bicuspid would be indicated as an X0123. The second bicuspid and permanent molar would also be indicated as all surfaces carious (X0123). When a carious lesion on a posterior tooth extends beyond the line angle onto another surface, then the other surface is also called carious.

Slide #13: Posterior Restorations

On this slide two permanent bicuspid and two permanent molars are in view. There is a restoration on the occlusal of the second bicuspid and a mesialbuccal-occlusal restoration on the first permanent molar. The status of the second permanent molar cannot be seen clearly. On the recording form, the second bicuspid would be indicated as a 5, the first permanent molar would be indicated as a 578. If no caries is detected on the first bicuspid, an S would be indicated for it on the recording form.

Slide #14: Anterior Restorations

Silicate or composite restorations can be noted on this slide of the upper lateral and cuspid. The mesial and distal of the lateral would be indicated as an 89 and the mesial of the cuspid would be indicated as an 8 on the recording form.

Slide #15: Interproximal Caries on Anterior Teeth

On this slide interproximal caries is present on the anterior teeth. These lesions can be readily confirmed with an explorer. Less obvious proximal lesions on anterior teeth can be picked up with transillumination.

Slide #16: Stainless Steel Crowns

This is a mixed dentition with stainless crowns on the second deciduous molar and first permanent molar. The primary second molar is scored as a D56789, and the permanent first molar is scored as 56789. There also appears to be a D59 on the first deciduous molar and a D7 on the deciduous cuspid.

Slide #17: Temporary Restorations

Temporary restorations with no surrounding decay are recorded in the same manner as permanent restorations. The second deciduous molar would be indicated as a D58.

Slide #18: Crowded Teeth

This slide shows crowding of lower permanent anterior teeth. These teeth, if non-carious, would all be indicated as S on the recording form. There is no special coding for crowded teeth.

Slide #19: Fractured Teeth

Fractured permanent teeth are to be examined for caries and are to be scored in the usual manner. Restorations placed as a result of the fracture are not to be scored. A fractured tooth restored with full coverage is to be coded as a Y. In this slide, the fracture has not been restored, and nor are there any carious lesions or other restorations present. Therefore, this tooth would be scored as an S.

Slide #20: Non-Vital Teeth

This is a non-vital deciduous central incisor. If the tooth is sound, it would be scored as a D. A permanent tooth would be scored as a S. (In the case of restorations if, in your opinion, a restoration on a non-vital tooth was placed solely in order to seal a root canal filling and not for caries, that restoration will not be scored.)

Slide #21: Space Maintainer

This is mixed dentition with the first deciduous molar extracted and a space maintainer present on the second deciduous molar. The space for the first



deciduous molar will be coded as a U for permanent unerupted. The second deciduous molar will be coded as a D58. The restoration on cuspid would be a D7.

#### Slide #22: Hypoplastic and Extracted Teeth

These are hypoplastic permanent teeth. These teeth are to be scored in the usual manner. (However, if you can determine that a restoration on a hypoplastic tooth was placed for esthetic reasons and not for caries, that restoration will not be scored.) The missing first permanent molar in this slide was probably extracted because of caries and, therefore, will be scored as an E.

#### Slide #23: Irregular Teeth

This lateral incisor has labial caries associated with the hypoplastic pits. The labial caries would be coded in the usual manner as a 1.

#### Slide #24: Crowned Teeth

This crowned central incisor can have two possible codes. Be sure to check with the child before recording. If the tooth was crowned due to trauma, it would be recorded as a Y. If crowned due to caries, it would be designated as all surface filled (6,7,8,9). There is no designation for the incisal edge of anterior teeth on the DMF form.

#### Slide #25: Partial Denture

A partial denture that replaces missing teeth can present a difficult problem in scoring. Since these centrals and laterals could have been lost due to trauma, it is again important to ask the child for a history of how and why the teeth were lost. Most children usually remember. Also check the general condition of other teeth in the mouth. (If lost due to decay, the teeth would be scored as 1.) If lost due to trauma, the teeth would be scored as a Y. (In the case of a deciduous dentition, teeth lost because of trauma or caries would be scored as U's.)

#### Slide #26: Orthodontic Banding

This slide shows an orthodontic patient with multiple banding. All visible surfaces are to be examined as well as possible, and scored in the usual manner.

#### Slide #27: Retained Primary Roots

The final slide is a dentition with both primary roots retained and portions of permanent teeth erupted. The permanent dentition always takes precedence over the primary--and if you look closely, portions of the central, lateral, cuspid, bicuspid and molars are all visible and their status would be recorded.

## DENTAL RESTORATIVE TREATMENT NEED INDEX

### Introduction

The DMF surface index is valuable for use in clinical studies or epidemiologic surveys to measure differences in caries experience among different groups of people or in the same group at different times. However, DMF surface data do not provide a satisfactory measure of the need for dental care in groups that are examined. For example, knowing that 16-year old children in a community have an average DMF surface score of 18 per child gives no indication of how many three-surface restorations, replacements of unsatisfactory restorations, crowns or extractions are needed by those children. Such information is essential for planning treatment programs of restorative care for population groups. The Dental Restorative Treatment Need Index has been developed to collect valid information on requirements for reparative dental care. The data collected from application of this simple index should be valuable for estimating the number and types of dental services and personnel required to provide comprehensive dental care.

### Codes

- 0 = No treatment needed
- 1 = 1 surface restoration
- 2 = 2 surface restoration (or 2 one surface restorations)
- 3 = 3 surface restoration (or 3 one surface restorations or 2 surface + 1 surface restorations)
- 4 = More than 3 surfaces, but not a crown (7)
- 5 = Extraction of primary tooth
- 6 = Extraction of permanent tooth
- 7 = Crown (either primary or permanent)
- 8 = Tooth replacement - when permanent tooth already missing and replacement needed
- 9 = Root canal or other pulpal treatment needed
  
- 68 = Extraction of permanent tooth and replacement needed
  
- 79 = Pulpal treatment and a crown needed

### General Instructions

In using the Dental Restorative Treatment Need (DRTN) Index, one code is used to designate the treatment required for each tooth space. The examiner should decide what treatment, if any, is needed for each tooth space at the time of examination. Current concepts of good, basic dental practice should be used in making diagnoses of the need for care. Immediately after a DMF score has been assigned to a tooth space, the appropriate DRTN code should be determined and entered on the examination form. There must be an entry for Dental Restorative Treatment Need for each tooth space.

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If a portion of an existing restoration is defective or has adjacent recurrent decay, but part of the restoration is intact, the entire restoration should be indicated for replacement. In other words, dovetailing of a new restoration into a satisfactory, existing portion of a restoration is not permitted.

When there is a treatment requirement for both a primary and permanent tooth in the same space, e.g., a restoration in a permanent tooth and extraction of a primary tooth, the requirement for both the permanent and primary tooth should be recorded.

Other than the need for extraction, no treatment needs for primary incisors should be indicated for any children examined in the survey. Thus, all primary incisors should be coded either as 0 or 5. A complete array of treatment needs may be recorded for primary cuspids and molars for all children examined in the survey through the age of 9. For children 10 and older, treatment needs for posterior primary teeth should be limited to 0 and 5.

It is not necessary to record the need for space maintenance or tooth replacement following the designated extraction of primary teeth. This need will be automatically handled by statistical programming, according to the age of the child.

A code of 68 should be recorded when a permanent tooth is designated for extraction, and when the examiner judges that a tooth replacement is needed and feasible. If following extraction the examiner believes that a replacement of the tooth is not warranted or possible, e.g., inadequate space, no opposing tooth or no suitable tooth for an abutment exists, a code of 6 only should be recorded.

## SLIDES FOR TRAINING EXAMINERS ON THE DENTAL RESTORATIVE TREATMENT NEED INDEX

### CODE 0 - NO TREATMENT NEEDED

#### Slide #01-0: Abrasion

This is a primary dentition with simple abrasion--no treatment is needed. These teeth would be coded as 0's.

#### Slide #02-0: Developmental Defects

This is a bifurcated primary lateral incisor. Because no restorative treatment should be recorded for primary incisors, no treatment need is scored even if decay is evident. This tooth would be coded as a 0.

#### Slide #03-0 & 04-0: Dental Fluorosis

This is a permanent dentition with moderate dental fluorosis--no treatment is indicated. (Code 0 for both slides.) If any of the hypoplastic pits are decayed, these would be indicated as single surface restorations needed. (Code 1)

#### Slide #05-0: Unerupted Permanent Teeth

This is a mixed dentition showing many different conditions. Your attention is directed to the spaces where the primary first and second molars were located. Even though these teeth were most likely extracted due to caries, no treatment is indicated. (Code 0.) Statistical programming will designate whether space maintenance is required.

#### Slide #06-0: Tooth Replacement Present

This is a permanent dentition with the four anterior teeth missing due to traumatic injury. If the tooth replacement present is satisfactory, the four missing teeth would be coded as a 0, indicating no treatment needed. NOTE: If the tooth replacement were not satisfactory, then these would be coded as 8's.

#### Slide #07-0: Minor Fractures on Anterior Teeth

This is a primary dentition with a minor fracture on the central incisor. This would be recorded as a 0, indicating no treatment needed.

#### Slide #08-0: Crowded Teeth

This is a lower permanent dentition with anterior crowding. Because malocclusion is not being recorded in this index, all these teeth would be coded as a 0, indicating no treatment needed.

Slide #09-0: Intact Restorations

This slide shows an upper mixed dentition (reflected image). If all of the restorations are intact, these teeth would be coded as 0's.

**CODE 1 - ONE-SURFACE RESTORATION**

Slide #10-1: Caries on Anterior Teeth

These are maxillary permanent teeth with a carious area on the central incisor at the gingival margin, and a small incisal fracture. Assuming that the incisal edge is not carious this would be coded only as a 1, indicating the need for a one surface restoration. If the incisal edge is also carious, this tooth would be coded as a 2 to indicate that two single surface restorations are needed.

Slide #11-1: Hypoplasia or Decalcification

This slide shows the lower permanent anteriors with hypoplasia or decalcification on the lateral incisors. If these areas are judged to be carious each lateral would be coded as a 1, indicating a one surface restoration is needed.

Slide #12-1: Irregular Teeth

This is a permanent lateral incisor with several pits on its facial surface. If decay is present and if it is believed that a single restoration would be utilized, this tooth would be coded as a 1. (Although it is impossible to tell from this photograph, it is possible that there is also decay on the lingual surface of the lateral incisor.)

Slide #13-1: Occlusal Caries

This is a lower permanent molar with obvious caries on the occlusal surface surrounding a restoration. This tooth would be coded as a 1, indicating the need for a one surface restoration.

**CODE 2 - TWO-SURFACE RESTORATION**

Slide #14-2: Pit and Fissure Decay and/or Stain

This slide shows a first permanent molar with dark stained grooves on the occlusal surface and a discolored buccal pit. If decay is present at both locations, this tooth would be coded as a 2, indicating the need for two one-surface restorations. If decay is present at one location, a code of 1 would be assigned and if no decay is present, the tooth would be coded as 0.

Slide #15-2: Buccal Pits and Decalcification

This is a first permanent molar with two carious buccal pits and decalcification present. If the decalcified areas are not carious, this tooth would be coded as a 2 to indicate a restoration is needed for each buccal pit. If it is believed that the carious areas would be repaired with one continuous restoration, this tooth would be coded as a 1.

Slide #16-2: Temporary Restorations

These are permanent teeth with a temporary restoration in the lower first molar. This tooth would be coded as a 2, indicating the need for a permanent MO restoration.

Slide #17-2: Fractured Restorations or Recurrent Caries

This is a permanent bicuspid with a fractured amalgam and, perhaps, recurrent caries. This tooth would be coded as a 2, indicating need for a two-surface DO restoration.

Slide #18-2: Decayed Cuspid and Faulty Restorations

This slide shows a permanent cuspid with decay on the distal surface. This tooth would be coded as a 2 to indicate the need for a two-surface restoration. There is no treatment need recorded for the two bicuspid present despite the obvious poor quality of the restorations. These teeth would be coded as 0's.

**CODE 3 - THREE-SURFACE RESTORATION**

Slide #19-3: Fractured Restorations

This is a mixed dentition with a fractured restoration on the second primary molar. This tooth requires a MOD restoration and would, therefore, be coded as a 3 for a three-surface restoration. Remember: Dovetailing of new restorations into existing ones is not permitted when scoring treatment needs.

Slide #20-3: Fractured Restorations

This is a permanent molar that required MOD restoration. This tooth would be coded as a 3, indicating the need for three-surface restoration.

Slide #21-3: Fractured and/or Carious Incisors

This is a permanent dentition with a fractured and carious central incisor. This tooth could be coded as a 2, 3, or 4, depending on the extent of the composite restoration needed. If the fracture involves the incisal edge and extends 1/3 or more of the distance across the tooth, the tooth would be coded as a 4 to indicate more than a three surface restoration is needed. If in the judgment of the examiner the fracture extends across less than 1/3 of the tooth, the tooth would be coded as a 2 or 3.

### Slide #22-3: Simple Caries in Primary Dentition

This is an upper primary dentition (mirror reflection) with caries present in all four molars and in the central incisors. The centrals would be coded as 0's. If the distal surfaces of both first primary molars are decayed, these teeth would be coded as 2's, indicating the need for D0 restorations. Since the transverse ridge of the upper molars should be preserved whenever possible, if the distal surfaces of the second molars are not decayed, but the mesial surfaces of both are decayed, these teeth would be coded as 3's, indicating the need for an M0 restoration and a restoration in the distal pit of the occlusal surface. If the distal surfaces of the second molars are decayed, these teeth would be recorded as 4's because they would require two two-surface restorations.

### **CODE 4 - MORE-THAN-THREE-SURFACE RESTORATION**

#### Slide #23-4: Caries in Anterior Teeth

These are permanent incisors. Assuming that decay is present on the mesial of the central, this tooth would be coded as a 4, indicating the need for more than a three-surface restoration. If decay is also present on the mesial of the lateral incisor and the incisal edge can be preserved, when it is restored, this tooth would be coded as a 1. If not, the lateral incisor would probably also be coded as a 4.

### **CODE 5 - EXTRACTION OF PRIMARY TOOTH**

#### Slide #24-5: Retained Primary Teeth

This is mixed dentition with a retained primary central incisor. This tooth would be coded as a 5 for extraction of a primary tooth.

#### Slide #25-5: Abscessed Primary Teeth

This is a mixed dentition with an abscess of the second molar. This tooth would be scored as a 5 to indicate extraction needed. (Reminder: The need for space maintenance will be determined according to the age of the child and will be automatically ascertained by statistical programming).

#### Slide #26-5: Nonvital Primary Teeth

This slide shows a nonvital primary central incisor. This tooth would be coded as a 5 for extraction. (If this were a nonvital permanent tooth, it would be coded as a 19.)

#### Slide #27-5: Retained Roots

This is a sound permanent dentition with several retained primary roots present. The primary roots would be coded as 5's to indicate need for

extraction. If the permanent teeth were decayed instead of sound, the permanent teeth would also be coded. As an example, if a permanent bicuspid needed a two-surface restoration and the roots of its antecedent primary tooth were still in place, the proper code for this combined condition would be a 52.

Slide #28-5: Pulpal Polyp

This is a mixed dentition with a pulpal polyp present in the second deciduous molar. This tooth would be coded as a 5 indicating need for extraction of this primary tooth.

Slide #29-5:

This is a mixed dentition with only a shell of the second primary molar remaining, and decay on the occlusal surface of the first permanent molar. The primary molar would be coded as a 5 for extraction. (Note: If in your judgment the surface within the shell is hardened, and if the tooth is asymptomatic and serving a useful function maintaining space, this tooth would then be coded as a 0.)

### CODE 6 - EXTRACTION OF PERMANENT TOOTH (CARIES)

Slide #30-6:

This is a permanent dentition with only shells of the first and second molars present. Both of these molars would be coded as a 68 to indicate the need for extraction of a permanent tooth due to caries and, if feasible, tooth replacement. As a general rule if permanent teeth must be extracted, the 8 code for tooth replacement should be indicated in addition to Code 6.

### CODE 7 - CROWN

Slide #31-7: Faulty Restorations

This slide shows a permanent central incisor with a faulty or worn restoration or crown. This tooth would be coded as a 7 to indicate a crown is needed.

Slide #32-7: Advanced Caries

This slide shows a primary first and second molar. Your attention is directed to the second molar only. If in the judgment of the examiner there is pulpal involvement, this tooth would be coded as a 79 indicating that pulpal treatment and a stainless steel crown are needed.

Slide #33-7: Recurrent Decay

This slide shows a primary first molar with both decay and an occlusal restoration present. This tooth could have several possible codes. If, in



the judgment of the examiner, the buccal and/or lingual walls of the tooth will be undermined in cavity preparation, a code 7 would be used to indicate the need for a stainless steel crown.

If the pulp is involved, code 79 would be used.

If a simple restoration would restore the tooth to full function, a code 2 would be used to indicate a DO replacement.

#### Slide #34-7: Fractured Incisors

This is a permanent dentition with a fracture of the upper central incisor. This tooth also has several possible codes. A code 7 should be used to indicate the need for a crown. If, however, in the judgment of the examiner, the pulp is involved, code 79 would be recorded.

If the pulp is not involved, and the tooth could be restored with a simple composite restoration, a code 4 would be used to indicate more than a three-surface restoration is needed.

### CODE 8 - PERMANENT TOOTH REPLACEMENT

#### Slide #35-8: Missing Permanent Teeth

This is a permanent dentition with the first permanent molar missing. This space would be coded as an 8 to indicate need for a permanent tooth replacement, if in the judgment of the examiner, replacement is possible and desirable.

#### Slide #36-8: Missing Permanent Teeth

This is a lower permanent dentition with a missing first permanent molar. This space would also be coded as 8 to indicate the need for a permanent tooth replacement (if possible and desirable).

### CODE 9 - ROOT CANAL OR OTHER PULPAL TREATMENT

Code 9 is always used in combination with other codes. Examples of the use of code 9 can be found in slides #26, #32, #33, and #34.

Hispanic HANES Dental Manual  
Addendum to Volume II  
February 22, 1982

**RE: Oral Soft Tissue Pathology**

A systematic collection of data on oral lesions will be enclosed in the Hispanic HANES dental examination.

The procedures for recording oral lesions and the specifications for the information about the characteristics of the lesion are described below.

Information to be collected about oral lesions will be recorded in the diagnostic impressions section on the physician's form. This should be recorded by the dentist.

The following information should be collected about an oral lesion observed by the dentist:

- 1) The fact that a lesion was observed.
- 2) The color of the lesion. Color should be recorded as red or leukoplakic.
- 3) Whether the lesion was sessile or pedunculated.
- 4) Whether the lesion appeared to be eroded.
- 5) The approximate estimated size of the lesion in millimeters.
- 6) The area of the mouth in which the lesion is located. Area should include at least: lesion on tongue, or quadrant of mouth (upper/lower, right/left). If more detail is possible as to location; for example, lesion in left lower quadrant of mouth on gum below second bicuspid, the dentist should record this.

Any other serious oral pathology found during the physician's exams would, of course, be recorded on the diagnostic impressions section of the physician's exam form, as long as it met the criteria for inclusion.

DENTAL EXAMINER'S MANUAL

VOLUME III - Vision Test Manual

## Chapter 1

### INTRODUCTION

Immediately after the dental examination is completed, the dentist will administer the vision test to those scheduled to get it and record the findings of the test on the vision test form. The dentist will then edit the form for consistency and completeness. S/he will also fill out the vision section of the Report of Findings I.

The vision test form is a two-page form consisting of three sections. The top of the first page of the form contains space for identifying information about the SP such as age and sex. The SP number will be stamped at the bottom of each page of the form. In most cases the Coordinator will have filled in Items a and b at the top of page one; however, if this has not been done, the dentist will have to fill in these items. Items a and b can be obtained from the Control Record. The dentist must record his/her examiner's number in Item c. Check Item A indicates whether Sloan letters vision charts or Landolt Ring vision charts have been used for the exam. Sloan letters charts contain alphabetic characters and should be used for literate SPs. Landolt Ring charts contain symbols and are used with illiterate SPs. Check the Sample Person Questionnaire (Medical History) to determine whether the SP is literate. Remember, some people will say they can read when they cannot. This is especially true for young children. If you begin the exam using the Sloan letters and find the SP can't read, you will have to switch to the Landolt Ring charts. Review of medical histories should be done before the arrival of the SPs for the session. The physician will have the questionnaires. Be sure to check the appropriate box in Check Item A.

The vision test parts should be done in the following order. First, test near vision, then test binocularity of vision, and finally test far vision. This order is important for two reasons. It minimizes the amount the SP has to move around the dental room, which is very small, and it minimizes the changes in lighting in the room to which the SP's eyes must adjust.

Before beginning the vision exam, explain to the SP that you are going to be testing his or her vision for reading, seeing distances and focusing. Explain that the tests will take about ten minutes.

## Chapter 2

### NEAR VISION TEST

#### General

The near vision test involves determining visual acuity at up to four fixed distances from 30 to 60 centimeters by having the SP read lines of letters on the Sloan or Landolt charts for near vision. The near vision test will be administered to all examinees ages 6-19 years and half the examinees ages 20-74 (those not in the glucose tolerance test subsample).

#### Equipment

In order to perform the near vision test you will need the following equipment:

- Sloan letters acuity card for near vision
- Landolt rings acuity card for near vision
- Near vision test bar

Before discussing the procedures for administering the test, it is important for the examiner to familiarize him/herself with the equipment. The near vision test bar is about 65 centimeters long with distances marked along its side. It also has a sliding metal frame which holds the near vision test card. There is a chin rest at one end of the bar. The SP places his/her chin against this rest. When positioning the bar, make sure the SP's eyes are on a vertical line with the zero mark on the distance bar. Also, remember to have the SP place one hand on the bar to prevent the slide from moving and hitting him/her. The bar provides a means of conducting the test at standard distances.

The near vision test card contains the letters to be read by the SP. Notice the distances listed along the left hand column of the card. Also note the distance equivalents in terms of visual acuity on the right side of the card.

The first four lines of the card (lines 620 through 310) have between five and ten letters in sequence across the card. If the SP reads these lines s/he should try to read the entire line. The next three lines, 250-160, also have ten letters but have a break in the middle. The entire line should also be read if these lines are attempted by the SP. The remainder of the card, lines 125 through 30, consists of 3 columns of five letters. If an SP is being tested without correction, s/he should start on the left side of the card and read the first ten letters (columns 1 and 2) on the line. If the SP is being tested with correction, s/he should read the second 10 letters on the line (columns 2 and 3). This prevents the SP from memorizing the letters the first time through.

Finally, look at the near vision test recording form. Check Item C at the top of the form contains information that will be used in analysis about whether or not the SP wears glasses. We are only interested in glasses or contact lenses worn to improve near vision in this part of the vision test. If the SP wears glasses for near vision for the test, check the appropriate box on the form.

The near vision form is actually divided into two main sections. Line number one of the form contains space to record test results without correction. The next line contains space to record test results with corrective lenses worn. The layout of the form is similar for both sections. There are four spaces to record visual acuity at four different distance readings on the near vision test bar.

### **Before the Test**

1. Make sure the lights in the dental room are turned on for the near vision exam.
2. Have the examinee get in a comfortable position for administering the test. S/he should be seated on the dental chair.
3. Ask the examinee whether he/she wears glasses or contact lenses for near vision. Mark the response in the appropriate answer box on the near vision form.
4. Explain to the examinee that the purpose of the test is to see how good his/her eyesight is for reading letters. Tell him/her to do his/her best in reading each letter on a given line, and even if he/she cannot identify all of the letters, he/she should read the ones that he/she can.
5. If an SP wears glasses for near vision, test him/her with and without correction. Test without correction first. Ask the SP to remove his/her glasses for this first part of the test. (If an SP wears contact lenses, s/he should not remove them. If the contacts are for near vision, the SP will only be tested once rather than twice.) Once the SP has been tested without correction, ask him/her to put on his/her glasses. Repeat the test with corrective lenses. If the SP is being tested without correction, you would record the results on the line marked "Both eyes without correction." If the SP is being tested with correction, you would fill out the second line of the form.

### **Administering the Test**

1. Place the test card at a distance of 40 centimeters by moving the metal slide on the near vision test bar (NVTB) to the 40 mark. Ask the SP to rest his/her chin against the chin rest and hold the NVTB with one hand.

2. Start the test by asking the SP to read the 20/20 line on the card.

a. Situation A, SP reads line correctly

If the SP reads the line with 3 or fewer errors, s/he has read the line correctly. The SP is allowed to make a specified number of errors in reading a line and still is considered to have read the line correctly. Next ask the SP to try to read the 20/16 line (one line down). This will determine whether the SP's near vision acuity is better than 20/20. If the SP can read this line, record this on the near vision test recording form in the column headed 40 cm. If s/he fails to read the 20/16 line correctly, then his/her visual acuity is 20/20. Record this on the recording form. If the SP can read the 20/20 line (or better) at 40 centimeters, go on to test the SP with correction, if appropriate. If the SP does not wear corrective lenses, or had to be tested only with corrective lenses (wears contacts for near vision), the near vision test is completed with the SP.

b. Situation B, SP cannot read line correctly

If the SP cannot read the 20/20 line at 40 centimeters, point to the 20/30 line (2 lines up) and ask the SP to read it. If the SP reads this correctly (getting all letters correct or within the acceptable number of errors), move down one line to see if the SP's near vision acuity is better than 20/30 but not as good as 20/20. If the SP fails to read the 20/30 line correctly, move up 2 more lines to the 20/50 line and repeat the process. Record the smallest line read correctly at 40 centimeters on the data form in the column headed 40 cm. For example, if an SP fails the 20/20 line and the 20/30 line, but reads the 20/50 line, you would ask him/her to read the 20/40 line. If the SP reads this line correctly, this would be recorded on the form.

3. Data are recorded on the recording form by locating, across the top of the form, the distance from the SP the card is being held. Thus far, we have been talking about 40 centimeters. This is the second column in this section. Simply write in the visual acuity on the first line, Both eyes without correction. Use lead zeros if necessary. For example, if the SP's visual acuity is 20/40, it should be recorded as 20/040. If the SP's visual acuity is 20/100, no lead zero is necessary.

4. All SPs who cannot read the 20/20 line at 40 centimeters will also be tested at 60, 50, and 30 centimeters. Begin by moving the metal slide out to 60 centimeters. Ask the SP to read the 20/20 line. Follow the procedures for administering and recording the test at 40 centimeters. Repeat for 50, 30 centimeters.

5. Once the SP has been tested without correction, repeat the test with correction (wearing glasses). Begin at 40 centimeters and follow the procedures outlined above.

## Chapter 3

### RANDOM DOT E TEST

#### Purpose

The Random Dot E (RDE) is used to test for binocularity of vision. It is particularly useful for determining the presence of amblyopia and for measuring stereoacuity thresholds, although it produces underestimates of actual thresholds. All SPs who are eligible for the vision exam will be given the RDE Test.

#### Materials

In order to perform the RDE Test, you will need to use the following materials:

Polarized glasses

Random Dot E test card with an E in stereo depth

Stereo blank card with no E, just a dotted background

A Model E card to be used during the explanation of the test

A dark shade that can be pulled down behind the SP to prevent glare on the surface of the cards.

#### Introduction to the Test

To better understand what is involved in the use of the RDE, put on the polarized glasses and view the RDE card which is labeled on the back with "RAISED" toward one edge of the card and "RECESSED" upside-down toward the opposite edge of the card.

The cards are called stereograms. It is important to hold the stereogram so that the long sides of the card are horizontal and the word "RAISED" is at the top of the card. If the long sides of the card are held vertically, the E may not be seen. If you have normal stereopsis, you will see the letter E in stereo depth on the card. The E should appear to be raised up off the test card. If you rotate the RDE card, so the word "RECESSED" is at the top, the E will appear to sink into the background, making an E shaped hole. During test administration, the RDE card should only be used with the word "RAISED" at the top of the card.

Now look at the card labeled "STEREO BLANK" through the polarized glasses. No E is seen, only the dotted background. To understand how the test would work for someone who has a problem with binocular vision, hold the RDE and STEREO



BLANK cards side by side. Look at them through the polarized glasses while you close one eye. The E should disappear and both cards will look the same.

### Instructions for Administering the RDE Test

1. Turn on the lights in the dental exam room for the test. Pull down the dark shade on the wall behind the SP. This will prevent any glare or light reflections on the card. The SP should be sitting on the dental chair.
2. Place the polarized glasses on the SP. If the SP wears prescription glasses, do not have him/her remove them for the test. If you are testing a child who is hesitant about putting on the glasses because s/he doesn't wear glasses, try creating a game. Tell him/her that they are "like sunglasses", or "special or magic glasses" and that s/he has to wear them to see magic pictures. Make sure the glasses are back on the SP's nose. If they slip forward, binocular vision may be impaired. Similarly, the SP should keep his/her head straight as tilting to one side will also interfere with the test.
3. Explain the test to the SP and let him/her practice until you are sure s/he understands. Hold the Model E card up to the SP and ask the SP what the figure is. If the SP cannot name it, tell him or her that it is an E and ask if s/he can see it. Hold the RDE card next to the STEREO BLANK card and ask the SP to tell you which card has the E. If the SP cannot tell you which card has the E, repeat the explanation process, put the cards behind your back and hold them out of sight (underneath the back of the dental chair is a good place) and shuffle them. Ask the SP to tell you on which card the E is this time. Once the SP understands the process continue with the test. Some SPs may not be completely literate. We have found that children sometimes have trouble naming the letter. If the SP appears to have a problem, simply tell him/her to indicate with his/her hand which card contains the E or to tell you on which card the three-legged table appears.
4. Perform the RDE test at two distances from the SP, 50 and 100 centimeters. In order to standardize the distance, we will be placing tape marks on the dental chair or on the wall to show you where to hold the cards from a fixed place on the dental chair. Ask the SP to sit back against the far arm of the chair with his/her back touching the counter in the dental room so that s/he is in the correct position. Check to see that the chair is in the correct position on the floor. There will be tape marks on the floor as guides. Hold the RDE and STEREO BLANK cards side by side at about 50 centimeters from the SP and ask on which card the E appears. Shuffle the cards as described above. Show the cards to the SP and ask again where the E is located.
5. Repeat this process two more times at 50 centimeters. The SP should be tested four times at each distance to so you can identify

guessing. Once the process has been understood, the answer should be correct every time if the SP has normal binocular vision.

6. Now hold the cards out at the 100 centimeter mark from the SP. Perform the test at that distance 4 times. Remember to shuffle the cards out of sight between each test administration. When you shuffle the cards, be careful not to use any consistent pattern since the SP may learn the pattern quickly and guess the correct answer.

### **Recording the Results**

The space for recording the results of the binocular vision (RDE) test can be found on page 2 of the vision test form. You will record whether the SP passed or failed the test at 50 and 100 centimeters. In order to pass, the SP must answer correctly all 4 times at a particular distance. If s/he answers incorrectly even one time at a specified distance, s/he has failed the test at that distance. Simply place a check in the appropriate box. Only one box may be checked for each distance.

### **Criteria for Referral**

If the SP cannot distinguish the E in the RDE card at all or if s/he can only see it when the card is 50 centimeters or closer, the SP should be referred to an eye doctor for further testing. Use the procedure described in Chapter 5 for this process.

## Chapter 4

### DISTANCE VISION TEST

#### Introduction

The distance vision test determines visual acuity at a fixed distance of 4 meters by having the SP read lines of either the Sloan letters or Landolt rings charts. The distance vision test is administered to all examinees ages 6-19 years and half the examinees ages 20-74 (those not in the glucose tolerance test subsample).

#### Materials and Equipment

You will need the following materials to perform the distance vision exam.

Illuminated wall charts with Sloan letters (SL) I, II, and III; wall charts with Landolt rings (LR) I, II, and III; and wall charts with Sloan letters reversed (SLR) I, II, and III

Eye cover (paddle)

Dark shade that can be pulled down over the window

Usually when vision is tested, individuals move closer or farther away to read the far vision test charts. However, the exam room in the MEC does not have enough space to allow SPs to move the appropriate distances from the chart. Consequently, charts with different size letters will be used at a fixed distance, 4 meters. This should approximate having the SP move closer or farther from the charts.

The Sloan letters reversed (SLR) charts are the primary measurement device. As in the case of near vision testing, the Landolt rings charts are used with illiterate respondents. Both the SLR and Landolt rings charts are used with the light box. The Sloan letters charts (SL) are used with a small subsample of the SPs in an experiment designed to examine the effect of using the mirror on the visual acuity data. The experiment, which will be conducted in the x-ray room, is discussed in more detail at the end of this section.

Each set of charts consists of three separate pages (charts), for example, SLR I, II, and III. Begin the test with SLR I. This chart will test visual acuity up to 20/100. If the respondent has to read the 20/100 line on this chart, you will have to remove SLR I from the light box and replace it in the light box with SLR II. The letters on this chart are bigger than those on SLR I. This chart tests visual acuity up to 20/160. SLR III tests acuity at 20/200 and must be slipped into the light box if the SP cannot read SLR II. If the SP can read the SLR I, there is no need to have him/her read SLR II or III.

The illuminated wall charts which the SPs will read during the distance vision test are located in two places in the dental exam room. SLR I, the chart that will be used the most, is located on the wall to the left as one enters the room. SLR II and III, as well as LR I, II and III are located in a packet in the dental room. SL I is also in the x-ray room vision chart box and SL II and III are located in a packet in the x-ray room. All charts are viewed at a distance of four meters either as a linear distance or via a mirror.

The recording form for distance vision has space to record visual acuity for four categories, (1) both eyes without correction, (2) the left eye with correction (if applicable), (3) the right eye with correction (if applicable), and (4) both eyes with correction. The form provides space to enter the visual acuity, for example, 20/200, 20/100, 20/60, depending on the smallest line the SP can read given the allowable number of errors. The allowable number of errors an SP can make and still read the line correctly is determined by the number of letters in the line. Each line (which may consist of one or two rows on the chart) has either 6, 8, or 10 letters. If there are 10 letters, the SP is allowed 3 errors. If there are 8 letters, the SP is allowed 2 errors and with 6 letters the SP is allowed 1 error. For example, if the SP were reading SL I, line 3 (SRDVC OZKNH), s/he could make 3 errors and still read the line "correctly" since line 3 allows 3 errors. The lines on the data form are preceded by codes that will be used when the data are computerized. You need not concern yourself with them.

Eye covers (paddles) are to be used when testing the right and left eye separately. The SP uses the paddle to cover the eye not being tested. It is important to remind each SP not to push against his/her eye with the paddle. This will temporarily blur his/her vision in the covered eye.

### **Before Conducting the Distance Vision Test**

1. Have the SP sit on the dentist's stool. Notice that there are marks on the far wall of the dental exam room towards the left corner. The stool should be positioned between these marks. You will also notice that there is a mark on the wall indicating about where the top of the SP's head should be. You will need to raise or lower the examining stool so that the SP is at the correct height.
2. The SP will be facing the mirror located above the sink. SLR I will be on the wall behind the SP. The SP will read the reflection of the letters in the mirror, not on the chart itself. This arrangement provides the distance needed for this test.
3. SLR II and III and LR I, II, and III are to be read in the same manner as SLR I.
4. Determine whether you should be using the Sloan letters (SP literate) or Landolt rings (SP illiterate). Generally, you should keep SLR I in the light box since you will be using it the most. If the SP is illiterate, slide the Sloan chart out of the light box and replace it with LR I.

5. Turn off the lights in the dental exam room and pull the shade down over the window.
6. Turn the light on in the chart box.
7. Ask the SP if s/he wears glasses for distance vision. If s/he does and has them available for the test, check Box 1 in Check Item B on the form. If the SP wears contact lenses for distance vision, check Box 2. You would not ask the SP to remove his/her contacts for the test. You would only test the SP with corrective lenses in this case.

### **Procedures for Conducting the Distance Vision Test**

1. The distance vision exam should be conducted in the following order:
  - a. For SPs with glasses:
    - Both eyes uncorrected
    - Each eye (separately) corrected
    - Both eyes corrected
  - b. For SPs without glasses or contact lenses:
    - Each eye (separately, uncorrected)
    - Both eyes (uncorrected)
  - c. For SPs with contact lenses (for distance vision):
    - Each eye (separately) corrected
    - Both eyes corrected
2. Point to the 20/30 line on SLR I and ask the SP to read it. To the left of the letters on the eye chart are three numbers. The first number tells you the visual acuity for that line at 4 meters. In order to calculate the acuity for a line, multiply this number by 20. The bottom line on the chart is 20/15 (.75 x 20), the next line up is 20/20 (1 x 20), the 3rd line up is 20/24 (1.2 x 20), and so on. The other two numbers that precede the lines of letters are used to calculate visual acuity at other distances. Since we will only be using one distance, 4 meters, these other numbers should be disregarded. Notice when you get to 20/40 (lines 5 and 6 from the bottom) the SP must read 2 lines. This is true for the remainder of the chart, except for the top line. If the SP fails to read the 20/80 line correctly, move to SLR II since the top line on SLR I is not a complete line. The number of acceptable errors is based on the number of letters in the line. For the 20/40 through 20/80 lines, this is two lines of five letters each. Consequently, it is important for the SP to attempt all the appropriate letters for the line.

3. If the SP reads the 20/30 line correctly (within the acceptable number of errors) have him/her read down successive lines on the chart until s/he fails to read a line correctly. The acuity for the smallest line read correctly should be recorded. For example, if the SP reads the 20/30 line correctly, the 20/24 line and the 20/20 line but fails to read the 20/15 line, you would record 20/20 as the SP's visual acuity.
4. If the SP initially fails to read the 20/30 line correctly, point to the 20/60 line and have him/her try to read it. If s/he reads that line correctly, move down successive lines until the SP fails to read a line correctly. Record the visual acuity for the smallest line read correctly. If s/he cannot read the 20/60 line, have him/her try to read the 20/80 line. If s/he can read this line correctly, move down the chart until the SP fails to read a line correctly and record visual acuity. If s/he cannot read the 20/80 line correctly, remove SLR I from the light box and replace it with SLR II. Have the respondent try the 20/100 line on SLR II. Record the visual acuity for the smallest line read correctly.
5. At no time is the top line of SLR I (20/100) considered a complete line. It has only three letters. The bottom line of SLR II must be used to test 20/100 vision.
6. Notice that each line on SLR II consists of two rows of three letters each. The visual acuity for the line at 4 meters appears to the left of the letters on the chart, 20/160, 20/120, and 20/100.
7. SLR III tests for 20/200 visual acuity. If the SP cannot read the 20/160 line (top of SLR II) have him/her try SLR III (20/200).
8. Record findings the same way no matter what charts you are using. Once you have determined the smallest line the SP can read correctly, record the correct visual acuity for the line. You should have only one entry on the line of the form for recording acuity for both eyes (uncorrected), one entry for the left eye, one for the right eye and one for both eyes (corrected). Record the values by right-justifying the entries: that is, use a zero in the first space when vision is better than 20/100, e.g. "20/020". If a line is not used, for example, when the SP is wearing contact lenses there is no value in the first line, fill in the spaces with zeroes. This also applies when the SP does not wear corrective lenses and the bottom line is not used.
9. The right and left eyes should be tested separately regardless of whether the SP wears corrective lenses. If the SP's number is odd, begin with the left eye, if it is even, begin with the right eye. Alternating whether the SP begins with the right or left eye is important since the SP will be learning the order of the letters each time s/he reads them. Alternating insures that the reported acuity in one or the other eye will not systematically be better. Follow the testing and recording procedures described above.

10. Finally, test both the SP's eyes with corrective lenses, if applicable or uncorrected for persons who do not wear glasses. Use the same testing and recording procedures described above.
11. Use the same testing and recording procedures for the SL and Landolt ring charts as for the SLR charts.

### **Conducting the Distance Vision Experiment**

The procedure involving the use of a mirror to approximate the 4-meter distance needed to conduct the vision exam was designed by NCHS staff in conjunction with representatives from the American Association of Optometrists. The accuracy of the procedure has not been tested. Consequently NCHS is interested in conducting an experiment to determine whether or not the use of the mirror distorts vision and thus effects visual acuity in any way.

The experiment will be conducted in the x-ray room. A light box will be placed in the room and the floor will be marked off at 4 meters. The Sloan Letters (SL) or Landolt ring (LR) charts will be used to conduct this test.

One person who is eligible for the vision test will be randomly selected from each exam session to participate in the distance vision experiment. After SPs have arrived at the MEC, take the daily list of SPs and number all eligible SPs. Use the random number table to randomly select an SP. The random number table is made up of rows and columns of numbers ordered randomly on the page. Enter the table randomly as discussed in training and identify the entry point. Your start point will be a one-digit number if fewer than ten SPs are eligible, or a two-digit number if ten or more SPs are eligible. Move vertically down the table number by number until you hit a number that represents an eligible respondent. This SP will participate in the vision test experiment.

Conduct the regular vision exam first. The SP should participate in at least one other exam component before the distance vision experiment is conducted. The experiment will need to be coordinated with the x-ray techs since the x-ray room will be in use. The SP should stand at the 4 meter line and attempt to read the SL I (or Landolt I) chart. The procedures for testing distance vision, using the chart and recording visual acuity are the same as those described for the SLR charts used in the regular vision exam. If the SP cannot read the SL I (or Landolt I) chart, replace it in the light box with the SL II (or Landolt II) chart. Use the SL III (or Landolt III) chart the same way. Always begin with Chart I even if the SP needed to read Chart II or III during the regular exam.

Record the results for the distance experiment on a second vision exam form. Be sure to mark the top of the distance vision experiment form.

## Chapter 5

### OTHER RESPONSIBILITIES

#### Editing the Form

1. Near vision section
  - a. Check to see that Check Item C is completed.
  - b. If 1 is checked in Check Item C, be sure both lines 1 and 2 are completed.
  - c. If 2 is checked in Check Item C, be sure only line 2 is completed.
  - d. If 3 or 4 is checked in Check Item C, be sure only line 1 is completed.
  - e. If vision at the 40-centimeter distance is 20/20 or better, be sure no other entries appear in this section.
  - f. If at 40 centimeters, vision is 20/25 or worse, see that results are also recorded for 30, 50, and 60 centimeters.
2. Random Dot E test (binocular vision)

Check to see that only one box is marked for each distance.
3. Distance vision section
  - a. Check to see that a, b, and c at the top of the form are completed.
  - b. Make sure Check Items A and B are completed.
  - c. If Box 1 is checked in Check Item B, be sure acuity is recorded for both eyes, with and without correction, and for the right and left eye with correction.
  - d. If 2 is checked, be sure acuity is recorded for both eyes with correction, and right and left eye with correction.
  - e. If 3 or 4 is checked, be sure acuity is recorded for both eyes without correction, right and left eye without correction.
  - f. Check to see that for each of the four entry lines, an entry exists. If the SP did not wear glasses, zero-fill the space marked both eyes with correction. If the SP wore contact lenses, zero-fill the space marked both eyes without correction.



- g. Check to see that all entries are righthand justified using a zero to fill in the entry when the acuity is better than 20/100, for example, 20/080.

### **Using the Landolt Ring Charts**

Landolt ring charts (symbols) are used to test illiterate SPs. Use these charts in exactly the same way you use the Sloan letter charts. Use the Landolt rings to test near and distance vision; they are not applicable for testing binocular vision. The Landolt ring charts contain the symbol "C" instead of letters.

There are four types of rings, those with the opening pointing left, and those with the opening pointing right, up and down. The rings are randomly ordered on each line on the charts for distance and near vision testing.

To use the Landolt rings you will need to have the SP look at the Landolt charts instead of those with the Sloan letters. Using the "mask" you will screen out all the symbols except the one you want the SP to "read". Simply ask the SP to point in the direction the opening of the ring is pointing. You will have to let the SP practice once or twice in order for him/her to become familiar with the procedure. Use the recording form and determine visual acuity exactly the same way you would if the Sloan letters are used.

### **Completing the Report of Findings**

After conducting the vision test, fill in the sections of the Report of Findings I that apply. Record acuity for the right eye and left eye separately. Check whether the test results were obtained with the SP wearing corrective lenses or not.

Next complete the section of the form for near vision test results. Report results for acuity at 40 centimeters distance only, corrected if applicable.

### **Referral**

The Report of Findings which contains information about the results of the near and far vision tests will be sent to the SPs health care provider 4 to 6 weeks after the exam. Furthermore, the physician will report any conditions of the eye on the Report of Findings that s/he observes. The physician will also be referring SPs who require eye care within 4 weeks of the exam using special referral procedures. Consequently, it is unnecessary for you to refer any SPs who have near or distance vision disorders for eye care. The only exception to this is if an SP does not pass the Random Dot E Test and has a problem with binocular vision. In that case, you should notify the physician of the problem and ask him/her to prepare a Type II Referral Letter which describes the problem and asks the SPs regular care giver to refer the SP to a local ophthalmologist.

### **Unusual Situations**

If the SP is blind in both eyes, write this on the top of the vision exam form and return it to the Coordinator.

If the SP is blind in one eye, but has vision in the other, place a large X through the sections of the form that are inappropriate but administer the tests for near and far vision for the eye with sight, following the instructions that pertain to the test.

### **Completing the Dental/Vision Log and Control Record**

As you may recall, you are required to complete the required information in the Dental/Vision Log for both the dental and vision exams. Fill in your initials under vision test form for each completed exam and your initials under Report of Physical Findings when you complete the appropriate section of the report form. If you do not conduct the vision exam on a SP or a problem arises during the exam, document this in the comments column.

You will also need to fill in the time in and out and your initials on the Control Record.

## Appendix

### **Vision Test Charts**

The vision test charts were made by the GOOD-LITE Company, 1540 Hannah Avenue, Forest Park, Illinois 60130.

# ACUITY CHART FOR NEAR

## SLOAN LETTERS

This chart should be held 16 inches (40cm) from the eyes, at right angles to the line of vision, and illuminated with not less than 10 or more than 25 foot candles of light.

CM	INCHES				DISTANCE EQUIVALENTS													
					DECIMAL													
620	256	O	S	N	R	H	.06	$\frac{20}{333}$										
500	192	Z	C	D	V	O	N	.08	$\frac{20}{250}$									
400	160	C	K	V	R	N	H	D	O	.1	$\frac{20}{200}$							
310	128	D	H	Z	V	K	R	C	O	S	N	.12	$\frac{20}{167}$					
250	96	R	N	H	S	O	K	D	C	Z	V	.16	$\frac{20}{125}$					
200	80	V	R	N	H	Z	D	C	K	S	O	.2	$\frac{20}{100}$					
160	64	S	O	C	Z	N	H	R	V	D	K	.25	$\frac{20}{80}$					
125	48	N	H	R	O	C	V	H	R	N	V	Z	S	K	D	.33	$\frac{20}{60}$	
100	40	O	V	O	R	D	O	O	B	K	R	B	K	H	Z	N	.4	$\frac{20}{50}$
80	32	H	E	V	Z	O	H	Z	O	V	R	K	N	G	O	.5	$\frac{20}{40}$	
60	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.66	$\frac{20}{30}$					
50	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.8	$\frac{20}{25}$					
40	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.0	$\frac{20}{20}$					
30	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.2	$\frac{20}{16.7}$					

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1540 Hannah Avenue, Forest Park, Ill

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**INTERNATIONAL SLOAN LETTER CHART for 4 meters (13 ft)**

**AND 2 m (6 ft 6 in) AND 1 m (3 ft 3 in)**

VISUAL ANGLE  
IN MINUTES FOR  
4m 2m 1m

**M**  
DISTANCE IN  
METERS AT WHICH  
DETAILS SUBTEN  
A ONE MINUTE  
VISUAL ANGLE

5 10 20 **H V C** 20

4 8 16 **C H K D** 16

**4** **N R V O**

3 6 12 **S R D V C** 12

**O Z K N H**

2.5 5 10 **D S N V C** 10

**H R K Z O**

**2** **O Z V S N**  
2 4 8 **K D C R H** 8

1.5 3 6 **Z S D V O H N K R C** 6

1.2 2.5 5 **O V S D K N R C Z H** 5

**1** 1 2 4 **D H Z V C O R S K N** 4

.75 1.5 3 **S R H V O K D C Z N** 3

International Sloan Letter Chart for 4 meters  
(13 ft.) without a mirror.

Minutes subtended  
at 4 meters, decimal  
and equivalent.

Distance at which de-  
tails subtend 1 minute.

S K C

$\frac{8}{20}$   $\frac{.12}{6}$   
 $\frac{160}{48}$

30

H V D

D K H

$\frac{6}{20}$   $\frac{.16}{6}$   
 $\frac{120}{36}$

25

C V R

O C Z R

$\frac{5}{20}$   $\frac{.20}{6}$   
 $\frac{100}{30}$

20

D S V N

**40 M BLOAN LETTERS**

Distance m (meters)  
Enellen m/M  
Visual Angle M/m

1.0 m	1.25 m	1.5 m	2.0 m
1/40 (20/800)	1.28/40 (20/840)	1.6/40 (20/800)	2/40 (20/400)
40'	32'	25'	20'

**R**

**S**

**D**

**K**

**Z**

**O**

**H**

**N**

INTERNATIONAL SLOAN LETTER CHART for 4 meters (13 ft)

AND 2 m (6 ft 6 in) AND 1 m (3 ft 3 in)

VISUAL ANGLE  
IN MINUTES FOR

DISTANCE IN  
METERS AT WHICH  
DETAILS SUBTEND  
A ONE MINUTE  
VISUAL ANGLE

4m 2m 1m

5 10 20

H O V

20

4 8 16

4

C H K D

16

R I O V

3 6 12

R S C V D

12

K Z O H N

2.5 5 10

S D C V N

10

Z K R H O

2

Z O N S V

2 4 8

C D K R H

8

1.5 3 6

O V D S Z

K R C N H

6

1.2 2.5 5

R I N S D K

V O H C Z

5

1

1 2 4

D H Z V C

O R S K N

4

.75 1.5 3

K D C Z N

S R H V O

3



**International Sloan Letter Chart for 4 meters  
(13 ft.) for use with a mirror.**

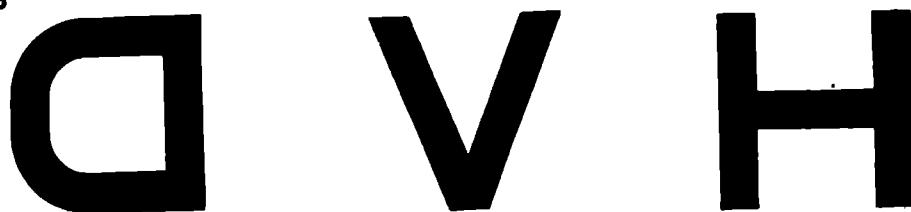
**Minutes subtended  
at 4 meters, decimal  
and equivalent.**

**Distance at which de-  
tails subtend 1 minute.**



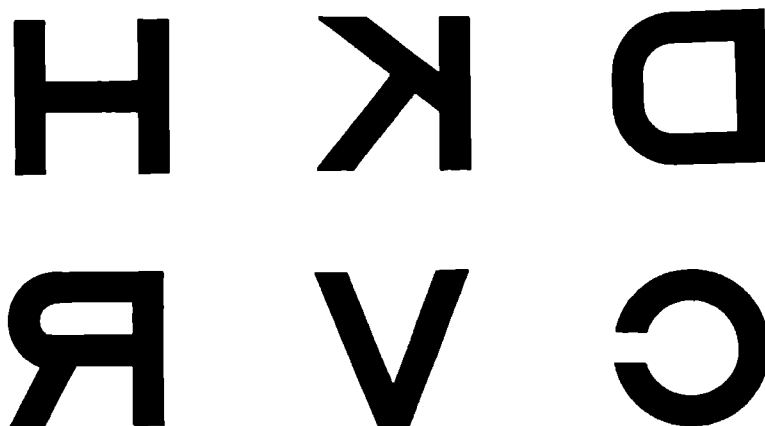
$\frac{8}{20} \frac{.12}{6}$   
 $\frac{160}{48}$

30



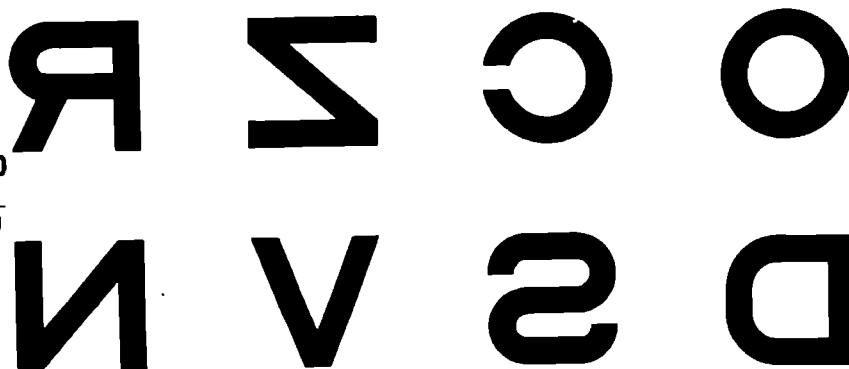
$\frac{6}{20} \frac{.16}{6}$   
 $\frac{120}{36}$

25



$\frac{5}{20} \frac{.20}{6}$   
 $\frac{100}{30}$

20



**40 M SLOAN LETTERS**

Distance m (meters)

Snellen m/M

Visual Angle M/m

1.0 m

1/40 (20/800)

40'

1.25 m

1 26/40 (20/640)

32'

1.6 m

1 6/40 (20/500)

25'

2.0 m

2/40 (20/400)

20'

2

Я

K

D

O

Л

И

Н

INTERNATIONAL LANDOLT C CHART for 4 meters (13 ft.)  
 AND 2 m (6 ft 6 in) AND 1 m (3 ft 3 in)

VISUAL ANGLE  
 IN MINUTES FOR

M  
 DISTANCE IN  
 METERS AT WHICH  
 DETAILS SUBTEND  
 A ONE MINUTE  
 VISUAL ANGLE

4m 2m 1m

5 10 20



20

4 8 16



16

**4**



3 6 12



12



2.5 5 10



10



**2**



8



2 4 8

1.5 3 6



6

1.2 2.5 5



5

**1**

1 2 4



4

.75 1.5 3



3

**International Landolt C Chart for 4 meters  
with or without a mirror.**

**Minutes subtended  
at 4 meters, decimal  
and equivalent.**

**Distance at which de-  
tails subtend 1 minute.**

$\begin{array}{r} 8 \quad .12 \\ \hline 20 \quad 6 \\ 160 \quad 48 \end{array}$				30	
$\begin{array}{r} 6 \quad .16 \\ \hline 20 \quad 6 \\ 120 \quad 36 \end{array}$				25	
$\begin{array}{r} 5 \quad .20 \\ \hline 20 \quad 6 \\ 100 \quad 30 \end{array}$					20

**40 M SLOAN LETTERS**

Distanci m (meters)

1.0 m

1.25 m

1.6 m

2.0 m

Snellen m/M

1/40 (20/800)

1.25/40 (20/640)

1.6/40 (20/500)

2/40 (20/400)

Visual Angle M/m

40'

32'

25'

20'

