

## INDEX

### ABBREVIATIONS

constituents of smokeless tobacco, 70

### ABRASION (DENTAL)

defined, 128

relation to smokeless tobacco, 130

### ABUSE LIABILITY OF

#### NICOTINE

defined, 145, 157

evidence for abuse potential, 166-167

experimental studies, 157-166

implications of studies, 162

pharmacodynamic effects, 158

research needs, 184

self-administration, 159-162

### ACANTHOSIS

clinical report, 115-118

defined, 113

### ADENOCARCINOMA

relation to snuff use, 48

### ADOLESCENT USE

attitudes, 24

data criteria, 17

ethnic groups, 20

males vs. females, 20

National Program Inspection study, 24

peer and family influences, 24

rural vs. urban areas, 20

### ADULT USE

patterns, 16-17

### ADVISORY COMMITTEE TO THE SURGEON GENERAL, REPORT

carcinogens revealed, vii

conclusions, vii-viii, xxii

gingival recession, viii

historical perspective of report, xvii-xix

nicotine addiction and effects, viii

noncancerous conditions, xxi

oral leukoplakia, viii

organization of report, xvii

overview, xx-xxii

precancerous oral health conditions, xxi

review methods, xix-xx

### ALCOHOL CONSUMPTION

relation to smokeless tobacco, 35

### ANIMAL MODELS

bioassays with chewing tobacco, 79, 82-83

bioassays with constituents of

smokeless tobacco, 86-88

bioassays with snuff, 83-86

metabolism of NMOR, 74-75

metabolism of NNK, 71-73

metabolism of NNN, 73-74

mutagenicity assays, 88-89

pharmacodynamic effects of nicotine, 158

physiologic effects of nicotine, 178

salivary glands, 126-127

short-term tests, 88-89

### ASIAN DATA

case-control studies, 42-43, 119

chewing of quids, 42-43, 50

esophageal neoplasms, 50

rates of oral cancer, 42-43

smokeless tobacco products, 42-43

smoking and oral cancer risk, 43-44

### *BIOASSAYS FOR CARCINOGENIC*

#### *ACTIVITY OF CHEWING*

#### *TOBACCO OR CHEWING*

#### *TOBACCO EXTRACTS, 80*

### *BIOASSAYS FOR CARCINOGENIC*

#### *ACTIVITY OF SNUFF OR SNUFF*

#### *EXTRACTS, 81*

### BIOASSAYS WITH

#### CHEWING TOBACCO

(See also ANIMAL MODELS)

application to the cheek pouch,

79, 82-83

application to the oral mucosa,

79, 82-83

oral administration, 79

skin application, 83

subcutaneous application, 83

### BIOASSAYS WITH

#### CONSTITUENTS OF

#### SMOKELESS TOBACCO

(See also ANIMAL MODELS)

inducement of tumors, 86-88

**BIOASSAYS WITH SNUFF**

(See also ANIMAL MODELS)

- application to the lip, oral
- mucosa, or cheek pouch, 84-86
- oral administration, 83-84
- relation to herpes simplex virus, 86-87
- subcutaneous administration, 86

**Bladder Neoplasms, See URINARY TRACT NEOPLASMS****Blockade Therapy, See NICOTINE ADDICTION TREATMENT****BUCCAL CARCINOMA**

- case studies, 34-36

**CALCULUS (DENTAL)**

- defined, 129
- use of smokeless tobacco, 130

**CARCINOGENICITY OF TOBACCO-SPECIFIC NITROSAMINES, 82****CARCINOGENS**

- daily exposure from snuff and chewing tobacco usage, 64
- in smokeless tobacco, 58-60, 64-65
- N-nitrosamines, 58-60, 64
- polonium-210 (<sup>210</sup>Po), 58, 65
- polynuclear aromatic hydrocarbons (PAH), 58, 65
- saliva analysis, 64

**CARCINOMA *IN SITU***

- defined, 114
- diagnoses differ, 123
- squamous cell carcinoma study, 120

**Cardiovascular System, See PHYSIOLOGIC EFFECTS OF NICOTINE****Central Nervous System, See PHYSIOLOGIC EFFECTS OF NICOTINE****CHARACTERISTICS OF SMOKELESS TOBACCO PRODUCTS, 6****CHEEK NEOPLASMS**

- (See also ORAL CANCER)
- animal models, 79, 82, 84
- case study, 120

**CHEMICAL COMPOSITION**

- processed tobacco, 58
- nicotine, 58

**CHEMICAL CONSTITUENTS OF SMOKELESS TOBACCO**

- carcinogens, 58-59, 60, 64-65
- chemical composition, 58

**CHEVRON KERATINIZATION**

- case report, 116-117
- defined, 114

**CHEWING TOBACCO (See also SMOKELESS TOBACCO, BIOASSAYS)**

- case-control studies, 36, 40
- characteristics, 5
- looseleaf, 5, 7
- plug, 5, 7
- twist, 5, 7

**Commonalities Between Tobacco and Other Addictive Substances, See NICOTINE ADDICTION****CONCEPTUAL MODEL**

- of smokeless tobacco lesions, 121
- CONCEPTUAL NATURAL HISTORY OF ORAL MUCOSAL CHANGES ASSOCIATED WITH THE USE OF SMOKELESS TOBACCO, 122**

**CORONARY AND PERIPHERAL VASCULAR DISEASE**

- acute coronary events, 177-178
- and nicotine, 177-178
- atherosclerosis, 177
- effect on platelets, 177
- endothelial injury, 177
- research needed, 185
- ventricular fibrillation, 178

**Cotinine, See PHARMACOKINETICS OF NICOTINE****CURRENT POPULATION SURVEY (CPS)**

- survey data, 12, 14

**DATA: ABUSE LIABILITY STUDIES AT ADDICTION RESEARCH CENTER, 160****DENTAL CARIES**

- defined, 128
- relation to smokeless tobacco, 129-130

**DOSE RESPONSE EFFECTS**

- (See also ANIMAL MODELS)
- and oral leukoplakia, 131
- nicotine, 147, 152-153, 158, 182-183

**DRUG DEPENDENCE**

- commonalities between tobacco and other substances, 146-147, 152-157
- defined, 145
- physiologic or physical dependence, 145-146

**DYSPLASIA**  
defined, 114  
diagnoses differ, 121, 123  
relation to oral lesions, 115-116

**Endocrine System, See**

**PHYSIOLOGIC EFFECTS  
OF NICOTINE**

**EPIDEMIOLOGIC STUDIES**

**AND SMOKELESS TOBACCO**

data from Asia, 42-44

data from North America and  
Europe, 33-42

oral cancer, 33-44

other cancers, 47-55

**EROSION (DENTAL)**

defined, 128

**ERYTHROPLAKIA**

defined, 113

**ESOPHAGEAL NEOPLASMS**

case-control study, 39, 48-50

cohort study, 49-50

**ESTIMATED EXPOSURE OF U.S.  
RESIDENTS TO NITROSAMINES,**  
64

**ESTIMATED RELATIVE RISKS  
ASSOCIATED WITH SNUFF USE  
FOR CANCERS OF THE ORAL  
CAVITY, PHARYNX, AND  
LARYNX, CASE-CONTROL  
DATA FROM VOGLER ET AL.,  
FEMALES ONLY, 38**

**ESTIMATED RELATIVE RISK FOR  
CANCER OF THE HEAD AND  
NECK FROM SMOKELESS  
TOBACCO USE BY ANATOMIC  
SITE, THIRD NATIONAL CAN-  
CER SURVEY, MALES ONLY, 39**

**ESTIMATED RELATIVE RISK OF  
ORO-PHARYNGEAL CANCER  
ACCORDING TO DURATION OF  
SNUFF USE AND ANATOMIC  
SITE, WINN ET AL., 41**

**ESTIMATES OF RELATIVE RISKS  
OF BLADDER CANCER IN  
PERSONS WHO HAVE EVER  
USED CHEWING TOBACCO  
AND SNUFF, 53**

**ETHNIC USE OF SMOKELESS  
TOBACCO**

of youth, 21-22

**Experimental Studies Exposing**

**Laboratory Animals,**

*See* ANIMAL MODELS

**FORMATION OF TOBACCO-  
SPECIFIC NITROSAMINES, 60**  
**FREQUENCY OF SMOKELESS  
TOBACCO USE IN PAST YEAR,**  
14

**Gastric Neoplasms,**

*See* STOMACH NEOPLASMS

**GENERAL PRINCIPLES IN  
EVALUATING CARCINOGENIC  
RISK OF CHEMICALS OR COM-  
PLEX MIXTURES (INTERNA-  
TIONAL AGENCY FOR  
RESEARCH ON CANCER, xxi**

**GINGIVAL AND PERIODONTAL  
HEALTH**

bone loss, 125

effects of smokeless tobacco, 101,  
103-104, 123

inflammation, 126

studies in Sweden, 126

studies in the United States, 125

**GINGIVAL CARCINOMA**

case studies, 34, 36, 44, 120

**GINGIVAL RECESSION**

Advisory Committee report, viii

defined, 123

related to oral leukoplakia/  
mucosal pathology, 112

studies in the United States, 125

**GINGIVITIS**

defined, 123

relation to smokeless tobacco,  
125, 129

studies in the United States, 125

**GLYCYRRHIZIC ACID**

metabolic consequences, 179

**HEAD AND NECK NEOPLASMS**

case-control study, 38-39, 38-39

**HEROIN ADDICTION**

**THERAPY**

model used, 156

**HERPES SIMPLEX VIRUS**

relation to oral cancer, 86-87, 93

**HISTORICAL PERSPECTIVE**

chewing tobacco, xvii

consequences of use, xviii-xix

decline of use, 5

early uses, xviii-xix, 5

snuff, xvii-xix

**HYPERKERATOSIS**

cohort study, 117-118

defined, 113

relation to snuff use, 125

- HYPERORTHOKERATOSIS**  
cohort study, 118  
defined, 113
- HYPERPARAKERATOSIS**  
cohort study, 118-119  
defined, 113
- HYPOKALEMIA**  
nonnicotine metabolic  
consequences, 179
- INHALED SNUFF**  
relation to nasal carcinoma, 93
- Kidney Neoplasms, See URINARY TRACT NEOPLASMS**
- LARYNGEAL NEOPLASMS**  
(See also **THIRD NATIONAL CANCER STUDY**)  
case-control study, 37, 38, 50-51
- Leukoplakia, Oral, See ORAL LEUKOPLAKIA**
- LIP NEOPLASMS** (See also **ORAL CANCER**)  
animal models, 84-85  
case-control study, 36  
labial mucosa, 116-117
- Looseleaf, See CHEWING TOBACCO**
- MANUFACTURING TRENDS: QUANTITIES OF SMOKELESS TOBACCO MANUFACTURED IN THE UNITED STATES FROM 1961 TO 1985 EXPRESSED IN MILLION POUNDS, 8**
- MEAN FREQUENCY OF SMOKELESS TOBACCO USE DURING LAST 7 DAYS BY ETHNICITY BY MALE RESPONDENTS, 23**
- METABOLIC PATHWAYS OF NMOR, 74**
- METABOLIC PATHWAYS OF NNK, 71**
- METABOLIC PATHWAYS OF NNN, 73**
- METABOLISM OF CONSTITUENTS OF SMOKELESS TOBACCO**  
conversion of products, xx-xxi  
of NMOR, 74-75  
of NNK, 71-73  
of NNN, 73-74
- MOUTH NEOPLASMS**  
(See also **ORAL CANCER**)  
case-control study, 36-37, 36, 37, 39, 120
- MUCOSAL PATHOLOGY**  
snuff-induced lesions, 114-116  
studies in Scandanavia, 111-112  
studies in the United States, 107, 108-109, 110-112
- MUTAGENICITY ASSAYS AND OTHER SHORT-TERM TESTS**  
(See also **ANIMAL MODELS**)  
chewing tobacco, 88  
snuff, 88  
tobacco-specific N-nitrosamines, 88-89
- NASAL NEOPLASMS**  
posterior nasal space tumors, 48  
relation to snuff use, 48
- Nass, See ASIAN DATA**
- NATIONAL BLADDER CANCER STUDY**  
relation to smokeless tobacco use, 52-53
- NATIONAL BLOOD CANCER STUDY**  
survey data, 16
- NATIONAL HEALTH INTERVIEW SURVEY (NHIS)**  
survey data, 10, 14-15
- NATIONAL INSTITUTE ON DRUG ABUSE (NIDA)**  
survey data, 13-15
- NATIONAL PREVALENCE OF CURRENT USE OF SNUFF BY GENDER, AGE, AND RACE FOR 1980 THROUGH 1985, 11**
- NATIONAL PREVALENCE OF SMOKELESS TOBACCO USE BY ADULT STATUS AND SEX, NIDA SAMPLE, 1985, 13**
- NATIONAL PREVALENCE OF SMOKELESS TOBACCO USE: DATA SOURCES, 9**
- NATIONAL SURVEY DATA**  
conclusions, 24-25  
Current Population Survey, 12, 14  
discussion of data, 14-15  
National Health Interview Survey, 10, 14-15  
National Institute on Drug Abuse Household Survey, 13-15  
Office on Smoking and Health Surveys, 7, 10, 12, 14  
Simmons Market Research Bureau, 10, 12, 14-15

- NEUROADAPTATION** (*See also* **PHYSICAL DEPENDENCE POTENTIAL OF NICOTINE, PHYSIOLOGIC EFFECTS OF NICOTINE**)  
 defined, 145  
 demonstrated, 153  
 nicotine, 162
- NICOTINE** (*See also* **PHARMACOKINETICS OF NICOTINE, NICOTINE ADDICTION, NICOTINE EXPOSURE, ABUSE LIABILITY, PHARMACODYNAMICS OF NICOTINE, PATHOLOGIC EFFECTS OF NICOTINE, AND SMOKELESS TOBACCO**)  
 absorption, 141-142, 185  
 cotinine levels, 143  
 dependence, 154  
 distribution, 142  
 elimination, 142-143  
 habituating agent, 58  
 levels, 143  
 physical dependence, 162-166  
 self-administration, 159-161  
 therapeutic effects, 154-155  
 turnover, 143
- NICOTINE ADDICTION** (*See also* **NICOTINE EXPOSURE, PHYSICAL DEPENDENCE POTENTIAL OF NICOTINE**)  
 commonalities with other  
   addictive substances, 146-147, 152-157, 184  
 dose manipulations, 153  
 encourages other drug use, 184  
 pattern of use, 152  
 relation to smokeless tobacco, 58, 144-147, 152, 185  
 self-administration, 152-153  
 social tolerance, 156  
 therapeutic effects, 154-155  
 tolerance of use developed, 153  
 treatment for, 155-156
- NICOTINE ADDICTION TREATMENT**  
 blockade therapy, 156  
 nicotine gum, 156  
 pretreatment, 156  
 substitution, 156  
 supportive therapy, 156
- NICOTINE CHEWING GUM**  
 as substitution, 156  
 reinforcing properties, 166-167  
 research needs, 184  
 self-administration, 167
- NICOTINE EXPOSURE**  
 (*See also* **NICOTINE, NICOTINE ADDICTION**)  
 delivery to the central nervous system, 147  
 other physiological effects, viii, xxii, xxvi  
 pharmacokinetics, xxiv, 141-144  
 peer pressure, 147, 152  
 reinforcer for animals, 147  
 relation to addiction, xxiv-xxv, 144-157
- NICOTINE SELF-ADMINISTRATION PATTERNS**, 161
- NMOR** (*See also* **ABBREVIATIONS**)  
 metabolism in rats, 74-75
- N-NITROSAMINES**  
 (*See also* **CARCINOGENS**)  
 exposure in nontobacco products, 64, 64  
 in snuff, 60  
 in tobacco leaves, 59  
 metabolized by tissue, 70-75  
 nonvolatile, 60, 62  
 tobacco-specific, 60, 63  
 volatile, 60, 61
- N-NITROSAMINES IN SMOKELESS TOBACCO**, 59
- NNK** (*See also* **ABBREVIATIONS**)  
 metabolism in rats, 71-73
- NNN** (*See also* **ABBREVIATIONS**)  
 metabolism in rats, 73-74  
 relation to buccal mucosa, 73  
 relation to lingual mucosa, 73
- NONCANCEROUS CONDITIONS**  
 (*See also* **PRECANCEROUS CONDITIONS**)  
 relation to smokeless tobacco, 100-105
- NONVOLATILE NITROSAMINES IN SMOKELESS TOBACCO (PPB)**, 62
- OFFICE ON SMOKING AND HEALTH (OSH)**  
 survey data, 7, 10, 12, 14
- ORAL CANCER** (*See also* **ORAL LEUKOPLAKIA, ORAL SOFT TISSUES, LIP NEOPLASMS, MOUTH NEOPLASMS, CHEEK NEOPLASMS, AND TONGUE NEOPLASMS**)  
 case studies, 34-41

- ORAL CANCER**—Cont.  
 epidemiologic studies, 33-55  
 in rats, 72, 79, 84-86, 88-89
- ORAL LEUKOPLAKIA**  
 causation, vii  
 defined, 113  
 prospective study, 118  
 relation to smokeless tobacco, viii,  
 xxiii-xxiv, 107, 110-112, 121  
 studies in Scandanavia, 111-112  
 studies in the United States, 107,  
 108-109, 110-112
- ORAL SOFT TISSUES**  
 clinical reports of lesions, 114-117  
 cohort studies, 117-119  
 definitions, 113-114  
 oral lesions, 119-120  
 transformation, 113-123
- PANCREATIC NEOPLASMS**  
 chewing tobacco use, 54-55
- PARANASAL SINUS  
 NEOPLASMS**  
 relation to snuff use, 48
- PATHOLOGIC EFFECTS OF  
 NICOTINE AND SMOKELESS  
 TOBACCO**  
 coronary and peripheral vascular  
 disease, 177-178  
 hypertension, 178  
 nonnicotine metabolic  
 consequences, 179  
 peptic ulcer disease, 178  
 pregnancy risks, 178-179
- PERIODONTAL TISSUE  
 DEGENERATION** (*See also*  
**MUCOSAL PATHOLOGY,  
 GINGIVAL AND  
 PERIODONTAL HEALTH**)  
 and teenagers, 110
- PERMISSIBLE LIMITS FOR  
 INDIVIDUAL N-NITROSAMINES  
 IN CONSUMER PRODUCTS**, 65
- PHARMACODYNAMICS OF  
 NICOTINE**  
 Liking Scale, 158  
 Morphine Benzadrine Group  
 Scale, 158  
 research needs, 184  
 self-administration  
 implications, 162
- PHARMACOKINETICS OF  
 NICOTINE**  
 absorption, 141-142  
 cotinine blood levels, 143
- PHARMACOKINETICS OF  
 NICOTINE**—Cont.  
 distribution, 142  
 elimination, 142-143  
 levels in smokeless tobacco, 141  
 nicotine blood levels, 143  
 time course of turnover, 143
- PHARYNGEAL NEOPLASMS**  
 case-control study, 37, 38, 39-40  
 cohort study, 41-42
- PHYSICAL DEPENDENCE  
 POTENTIAL OF NICOTINE  
 (See also NEUROADAPTATION)**  
 defined, 145, 162  
 determination, 153-154  
 evidence for physical dependence,  
 157-166  
 evidence of withdrawal  
 symptoms, 164-166  
 implications of physical  
 dependence, 166  
 reinforcement with nicotine  
 gum, 167  
 studies conducted, 157, 162-163  
 tobacco withdrawal, 163-164
- PHYSIOLOGIC EFFECTS OF  
 NICOTINE** (*See also NEURO-  
 ADAPTATION, PHYSICAL  
 DEPENDENCE POTENTIAL  
 OF NICOTINE*)  
 cardiovascular system, 175-176  
 central nervous system, 147, 176,  
 183  
 differentiation possible, 162  
 endocrine system, 176  
 pleasant effects produced, 162,  
 176
- PLAQUE**  
 defined, 128  
 use of smokeless tobacco, 130
- Plug**, *See* **CHEWING TOBACCO**
- Polonium-210 (<sup>210</sup>Po)**,  
*See* **CARCINOGENS**
- Polynuclear Aromatic  
 Hydrocarbons (PAH)**,  
*See* **CARCINOGENS**
- POSTERIOR NASAL SPACE  
 TUMORS**  
 relation to liquid snuff, 48
- PRECANCEROUS CONDITIONS  
 (See also NONCANCEROUS  
 CONDITIONS)**  
 Advisory Committee Report, xxi  
 defined, 113  
 relation to leukoplakia, 119  
 relation to smokeless tobacco, xxi

**PRECANCEROUS LESION**

defined, 113  
oral lesions, 119

**PREVALENCE OF SMOKELESS TOBACCO USE BY CENSUS REGION, 1985, 16**

**PREVALENCE OF USE OF SMOKELESS TOBACCO AMONG YOUTH BY GENDER AND GRADE: LOCAL SURVEYS USING STANDARDIZED QUESTIONS, 21-22**

**PREVALENCE OF USE OF SMOKELESS TOBACCO AMONG YOUTH BY GENDER AND GRADE: REGIONAL AND STATE LEVEL SURVEYS REPORTED SINCE 1980, 18-19**

**PREVALENCE OF SNUFF AND CHEWING TOBACCO USE BY ADULT MALES IN 10 GEOGRAPHIC AREAS, 17**

**PREVALENCE OF SNUFF USE AMONG COLLEGE STUDENTS 18 YEARS OF AGE OR OLDER BY GENDER AND YEAR, 12**

**PREVALENCE OF THE USE OF SNUFF AND CHEWING TOBACCO AMONG MALES BY AGE, 1970 NHIS AND 1985 CPS SURVEYS, 11**

Quids, *See* ASIAN DATA

**RECENCY OF SMOKELESS TOBACCO USE BY SEX AND AGE GROUP, 13**

**RELATIVE RISK OF ORAL CANCER FROM BETEL QUID WITH AND WITHOUT TOBACCO (WITH 95-PERCENT CONFIDENCE LIMIT), 43**

**RELATIVE RISKS OF ESOPHAGEAL CANCER IN PERSONS EXPOSED TO CHEWING TOBACCO AND SNUFF: SUMMARY OF FOUR CASE-CONTROL STUDIES, 49**

Renal Neoplasms, *See* URINARY TRACT NEOPLASMS

**RESEARCH NEEDS**

carcinogenesis, 93-94  
nicotine exposure, 184-185  
oral health effects 131-132  
prevalence/trends of use, 25  
standardizing methods, 25

**SALIVA ANALYSIS**

of snuff dippers, 64

**SALIVARY GLANDS**

effects of smokeless tobacco, 101-103, 126-128

**SCHEME LINKING NICOTINE TO FORMATION OF THE PROMUTAGENIC DNA ADDUCT O<sup>6</sup>-METHYLGUANINE, 72**

**SELECTED STUDY SUMMARIES FOR THE NONCANCEROUS ORAL HEALTH EFFECTS FROM THE USE OF SMOKELESS TOBACCO, 100-105**

**SIALADENITIS**

defined, 123  
relation to smokeless tobacco, 127  
relation to snuff dippers, 127

**SIMMONS MARKET**

RESEARCH BUREAU  
survey data, 10, 12, 14-15

**SMOKELESS TOBACCO (*See also* CHEWING TOBACCO, SNUFF)**

carcinogenesis associated with, 33-93  
chemical constituents, 58-69  
cohort studies, 41-42  
commonalities with other addictive substances, 146-147, 152-157  
conclusions, 24-25, 92-93, 130-131, 182-183  
effect on oral leukoplakia/mucosal pathology, 107-112  
epidemiologic studies and case reports of oral cancer, 33-44  
epidemiologic studies of other cancers, 47-55  
evidence for abuse and dependence, 166-167  
experimental studies exposing laboratory animals, 78-79  
experimental studies of abuse and dependence, 157-166  
metabolism of constituents, 70-75  
nicotine addiction, 144-146  
nicotine exposure, xxiv, 141-185  
noncancerous and precancerous oral health effects, xxiii-xxiv, 99-130  
pharmacokinetics of nicotine, 141-144  
physiologic and pathologic effects, 175-179  
prevalence and trends of use, xxii, 4-24

- SMOKELESS TOBACCO**—Cont.  
 product characteristics, 5  
 research needs, 25, 93-94,  
 131-132, 184-185  
 transformation of oral soft  
 tissue, 113-120  
 trends in production and sales,  
 5, 7  
 trends in self-reported use, 7, 10,  
 12-17, 20, 24
- SMOKELESS TOBACCO AND HEAD  
 AND NECK CANCER BY ANA-  
 TOMIC SITE, CASE-CONTROL  
 DATA FROM VINCENT AND  
 MARCHETTA, MALES ONLY, 38**
- SMOKELESS TOBACCO AND  
 MOUTH CANCER, CASE-  
 CONTROL DATA FROM  
 MOORE ET AL., 36**
- SMOKELESS TOBACCO AND  
 MOUTH CANCER, CASE-  
 CONTROL DATA FROM  
 PEACOCK ET AL., 37**
- SNUFF** (*See also* **SMOKELESS  
 TOBACCO, BIOASSAYS,  
 ANIMAL MODELS**)  
 case-control studies, 37, 40  
 characteristics, 5  
 dry, 7  
 historical uses, xviii-xix  
 levels of carcinogens, 60, 64-66  
 moist, 7  
 relation to cancer, 41, 53-55  
 saliva analysis, 64
- SNUFF-DIPPER'S CARCINOMA**  
 defined, 113  
 exposure to nitrosamines, 64  
 oral lesions, 120  
 reports, 35  
 Scandinavian study, 111
- SQUAMOUS CELL CARCINOMA**  
 case studies, 34-36  
 clinical study, 117  
 defined, 114  
 oral lesions, 119-120  
 snuff and ear neoplasms, 47
- STAINING (DENTAL)**  
 defined, 129
- STATE AND LOCAL SURVEY  
 DATA**  
 adolescent use, 17, 20, 24-25  
 adult use, 16-17
- STOMACH NEOPLASMS**  
 relation to smokeless tobacco,  
 51-52
- Substitution Therapy, See  
 NICOTINE ADDICTION  
 TREATMENT**
- SUMMARY OF DATA: LIABILITY  
 OF NICOTINE AS TOBACCO  
 SMOKE OR INTRAVENOUS  
 INJECTIONS, 159**
- SUMMARY OF REPORTS IN  
 WHICH NICOTINE WAS AVAIL-  
 ABLE UNDER INTRAVENOUS  
 DRUG SELF-ADMINISTRATION  
 PROCEDURES, 148-151**
- SUMMARY OF SELECTED CASE  
 REPORTS, 106**
- Supportive Therapy, See  
 NICOTINE ADDICTION  
 TREATMENT**
- Surgeon General's Advisory  
 Committee on the Health  
 Consequences of Using Smokeless  
 Tobacco, See ADVISORY  
 COMMITTEE TO THE SUR-  
 GEON GENERAL, REPORT**
- TEETH**  
 dental caries, 129-130  
 effect of smokeless tobacco,  
 128-130  
 other hard tissue effects, 130
- THERAPEUTIC EFFECTS OF  
 NICOTINE**  
 as an anorectic, 154  
 mood regulator, 154  
 performance of cognitive tasks,  
 154  
 self-medication, 155  
 work enhancement, 154
- THIRD NATIONAL CANCER  
 STUDY (TNCS)**  
 bladder cancer, 54  
 laryngeal neoplasms, 50-51  
 other cancer sites, 55  
 stomach neoplasms, 52
- TOBACCO SNIFFING**  
 rare practice, xvii
- TOBACCO-SPECIFIC  
 N-NITROSAMINES IN SMOKE-  
 LESS TOBACCO (PPB), 63**
- TOBACCO-SPECIFIC  
 N-NITROSAMINES IN SNUFF,  
 U.S. BRANDS, 1985, 66**
- TOBACCO WITHDRAWAL**  
 (*See also* **PHYSICAL DEPEN-  
 DENCE OF NICOTINE**)  
 evidence of symptoms, 164-166



**TOBACCO WITHDRAWAL—**  
Cont.  
study findings, 165  
symptoms, 163-164  
University of Minnesota  
studies, 164-166  
**TONGUE NEOPLASMS** (*See also*  
**ORAL CANCER, MOUTH**  
**NEOPLASMS**)  
case-control study, 36, 120  
**TRENDS IN PRODUCTION**  
**AND SALES**  
categories of products, 7  
temporal trends, 7  
United States Department of  
Agriculture (USDA) reports, 5  
**TRENDS IN SELF-REPORTED**  
**USE: SURVEY DATA**  
national survey data, 7, 10, 12-15  
state and local survey data,  
15-17, 20, 24  
Twist, *See* **CHEWING TOBACCO**  
**URINARY TRACT NEOPLASMS**  
case-control studies, 52-54  
relationship to smokeless  
tobacco, 52-54

**USE OF SMOKELESS TOBACCO IN**  
**THE UNITED STATES BY**  
**INDIVIDUALS OVER 21 YEARS**  
**OF AGE, 10**

**VARIATIONS IN TERMS USED AND**  
**DEFINITIONS PROVIDED FOR**  
**GINGIVITIS AND GINGIVAL RE-**  
**CESSION BY STUDIES CITED, 124**  
**VARIATIONS IN TERMS USED AND**  
**DEFINITIONS PROVIDED FOR**  
**LEUKOPLAKIA/MUCOSAL**  
**PATHOLOGY ASSOCIATED**  
**WITH SMOKELESS TOBACCO**  
**USED BY STUDIES CITED,**  
**108-109**

**VERRUCOUS CARCINOMA**  
defined, 114  
dysplastic lesions, 131  
**VOLATILE NITROSAMINES IN**  
**SMOKELESS TOBACCO (PPB),**  
**61**

**WORLD HEALTH**  
**ORGANIZATION (WHO)**  
Committee on Drug Dependence,  
145  
defines oral leukoplakia, 107  
differing diagnoses, 123

**DISCRIMINATION PROHIBITED:** Under provisions of applicable public laws enacted by Congress since 1964, no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity (or, on the basis of sex, with respect to any education program or activity) receiving Federal financial assistance. In addition, Executive Order 11341 prohibits discrimination on the basis of age by contractors and subcontractors in the performance of Federal contracts, and Executive Order 11246 states that no Federal-funded contractor may discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Therefore, the Public Health Service must be operated in compliance with these laws and executive orders.