

List of Abbreviations

α	alpha	ASSET	AngloScandinavian Study of Early Thrombolysis
β	beta	BAL	bronchoalveolar lavage
δ	delta	BENESCO	Benefits of Smoking Cessation on Outcomes
κ	kappa	bid	twice a day
μ	mu	BMI	body mass index
$\mu\text{g/ml}$	microgram per milliliter	BRFSS	Behavioral Risk Factor Surveillance System
15-D	15 dimensions [generic, self-administered measure of HRQoL]	C3I	Cancer Center Cessation Initiative
2-SORA	selective receptor 2 antagonist	CABG	coronary artery bypass grafting
5 A's	Ask, Advise, Assess, Assist, Arrange	CAC	coronary artery calcification
AAA	abdominal aortic aneurysm	CAD	coronary artery disease
AAC	Ask, Advise, Connect	CAGE 50	number of segments with coronary artery stenosis of greater than or equal to 50%
AACR	American Association for Cancer Research	CALIBER	Clinical research using Linked Bespoke studies and Electronic health Records
AAR	Ask, Advise, Refer	CASS	Coronary Artery Surgery Study
AARP	American Association of Retired Persons	CAST	Cardiac Arrhythmia Suppression Trial
ABI	ankle-brachial index	CBT	cognitive behavioral therapy
ACA	Patient Protection and Affordable Care Act	CCA	common carotid artery
ACC	anterior cingulate	CCQ	Clinical COPD Questionnaire
ACE	angiotensin-converting enzyme	CCS	Cancer Control Supplement
ACT	acceptance-based therapy	CDC	Centers for Disease Control and Prevention
ADHD	attention-deficit/hyperactivity disorder	CDER	Center for Drug Evaluation and Research
AF	atrial fibrillation	CHANCES	Consortium on Health and Ageing: Network of Cohorts in Europe and the United States
aFRs	adjusted fecundability ratios	CHD	coronary heart disease
AGS	additive genetic score	CHDA	coronary heart disease hard, definite angina, probable angina if followed by revascularization
AHRR	aryl-hydrocarbon receptor repressor	CHDH	coronary heart disease hard [myocardial infarction, resuscitated cardiac arrest, coronary heart disease death]
AMI	acute myocardial infarction	CHF	congestive heart failure
AML	acute myeloid leukemia	CHIP	Children's Health Insurance Program
AMPA	α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid	CI	confidence interval
ANOVA	analysis of variance	CIMP-high	CpG island methylator phenotype
AoAC	aortic artery calcium	CIN3	cervical intraepithelial cancer grade 3
aOR	adjusted odds ratio	CIS	carcinoma in situ
APO	apolipoprotein	cm	centimeter
APPROACH	Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease		
aPR	adjusted prevalence ratio		
AQCs	alternative quality contracts		
ARIC	Atherosclerosis Risk in Communities		
ARR	absolute risk reduction		
ASCO	American Society of Clinical Oncology		

CMS	Centers for Medicare and Medicaid Services	EORTC-LC13	European Organization for Research and Treatment of Cancer Quality of Life Questionnaire, Lung Cancer Module
CO	carbon monoxide	EPIC	European Prospective Investigation into Cancer and Nutrition
COLD	chronic obstructive lung disease	eReferral	electronic referral
CONSTANCES	Consultants des Centres d'Examens de Santé	ESTHER	Epidemiological Investigations on Opportunities for Prevention, Early Detection and Optimised Treatment of Chronic Diseases in the Elderly Population
COPD	chronic obstructive pulmonary disease	EURQoL	European quality of life
cpd	cigarettes smoked per day	EVALI	e-cigarette- or vaping-associated lung injury
CpG	cytosine-phosphate-guanine	F	females
CPP	conditioned place preference	F2:Cr	F2 isoprostane:creatinine
CPS	Cancer Prevention Study	F2RL3	factor II receptor-like 3
CRF	corticotropin-releasing factor	FCTC	Framework Convention on Tobacco Control
CRP	C-reactive protein	FDA	U.S. Food and Drug Administration
CT	computed tomography	FEV₁	forced expiratory volume at 1 second
CTP	Center for Tobacco Products	FINRISK	Large Finnish population survey on Risk factors on chronic, noncommunicable diseases
CVA	cerebrovascular accident	FMD	flow-mediated dilation
CVD	cardiovascular disease	fMRI	functional magnetic resonance imaging
CVDA	CVDH, CHDH, atherosclerotic death, CVD death	FRENA	Factores de Riesgo y Enfermedad Arterial [Registry]
CVDH	CHDH, stroke death, stroke	FSH	follicular-stimulating hormone
dACC	dorsal anterior cingulate cortex	FTND	Fagerström Test for Nicotine Dependence
DALYs	disability-adjusted life-years	FVC	forced vital capacity
DART	Diet and Reinfarction Trial	g	gram
dIPFC	dorsolateral prefrontal cortex	GDM	gestational diabetes mellitus
DM	diabetes mellitus	GED	General Education Development
DMN	default mode network	GLT	glutamate transporter
dmPFC	dorsomedial prefrontal cortex	GPR15	G protein-coupled receptor 15
DNA	deoxyribonucleic acid	GPS	global positioning system
DoD	U.S. Department of Defense	GRADE	Grading of Recommendations Assessment, Development, and Evaluation
DORs	delta opioid receptors	GWAS	genomewide association study
DRD2	dopamine receptor D2	HAPIEE	Health, Alcohol, and Psychosocial factors In Eastern Europe
EAGLES	Evaluating Adverse Events in a Global Smoking Cessation Study	HB-IPN	habenula-interpeduncular
e-cigarettes	electronic cigarettes	HDL	high-density lipoprotein
ECLIPSE	Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints	HDL-C	high-density lipoprotein cholesterol
ED	erectile dysfunction	HEDIS	Healthcare Effectiveness Data and Information Set
EHRs	electronic health records	HELLP	hemolysis, elevated liver enzymes, and low platelet count
ELSA	English Longitudinal Study of Aging		
ELSA-Brazil	Brazilian Longitudinal Study of Adult Health		
EMS	emergency management system		
ENDS	electronic nicotine delivery systems		
EORTC	European Organisation for Research and Treatment of Cancer		
EORTC-H&N35	European Organization for Research and Treatment of Cancer Quality of Life Questionnaire, Head and Neck Module		

HINTS	Health Information National Trends Survey	LVEF	left ventricular ejection fraction
HIPAA	Health Insurance Portability and Accountability Act of 1996	M	males
HITECH	Health Information Technology for Economic and Clinical Health	MAO	monoamine oxidase
HMO	health maintenance organization	MAOI	monoamine oxidase inhibitor
HPV	human papillomavirus	MassHealth	Massachusetts Medicaid
HR	hazard ratio	MCS	Mental Component Summary
HRQoL	health-related quality of life	MEPS	Medical Expenditure Panel Survey
HT	hypertension	MESA	Multi-Ethnic Study of Atherosclerosis
IARC	International Agency for Research on Cancer	MeSH	Medical Subject Headings
IASLC	International Association for the Study of Lung Cancer	MF	males and females
ICAM-1	intercellular adhesion molecule-1	mg	milligram
ICC	invasive cervical cancer	mg/dL	milligram per deciliter
ICD	International Classification of Diseases	mGluR	metabotropic glutamate receptor
ICESCC	International Collaboration of Epidemiological Studies of Cervical Cancer	Mh	to search Medical Subjects Headings in MEDLINE or PubMed
ICH	intracerebral hemorrhage	MHb	medial habenula
IL	interleukin	MHb-IPN	medial habenulo-interpeduncular nucleus
IMT	intimal-media thickness	mHealth	mobile health
IOM	Institute of Medicine	MI	myocardial infarction
IPAQ	International Physical Activity Questionnaire	MILIS	Multicenter Investigation of Limitation of Infarct Size
IPN	interpeduncular nucleus	mL	milliliter
ISFAMI	Israel Study of First Acute Myocardial Infarction	mm	millimeter
IVF	in vitro fertilization	mmol	millimole
IVR	interactive voice response	MORGAM	Monica Risk Genetics Archiving and Monograph
KAROLA	Langzeiterfolge der Kardiologischen Anschlussheilbehandlung [Long Term Success of Cardiologic Rehabilitation Therapy]	MORs	mu opioid receptors
kg	kilogram	MPEP	2-methyl-6-(phenylethynyl) pyridine
km	kilometer	MRFIT	Multiple Risk Factor Intervention Trial
KORA	Kooperative Gesundheitsforschung in der Region Augsburg [Cooperative Health Research in the Augsburg Region]	MRI	magnetic resonance imaging
KORs	kappa opioid receptors	M RTP	modified risk tobacco product
L	liter	MSA	Master Settlement Agreement
lbs	pounds	MSI-high	microsatellite instability
LDCT	low-dose computed tomography	MTF	Monitoring the Future
LDL	low-density lipoprotein	NA	not applicable
LDL-C	low-density lipoprotein cholesterol	NA	not available
LDTg	laterodorsal tegmental nucleus	NAc	nucleus accumbens
LGBT	lesbian, gay, bisexual, and transgender	nAChR	nicotinic acetylcholine receptor
		NAM	negative allosteric modulator
		NAMCS	National Ambulatory Medical Care Survey
		NATS	National Adult Tobacco Survey
		NCCN	National Comprehensive Cancer Network
		NCHS	National Center for Health Statistics
		NCI	National Cancer Institute

NCQA	National Committee for Quality Assurance	PRAMS	Pregnancy Risk Assessment Monitoring System
ng/mL	nanogram per milliliter	PROM	premature rupture of the membranes
NHANES	National Health and Nutrition Examination Survey	PTCA	percutaneous transluminal coronary angioplasty
NHIS	National Health Interview Survey	PVD	peripheral vascular disease
NIBS	noninvasive brain stimulation	q	every
NICU	neonatal intensive care unit	QALYs	quality-adjusted life years
NIH	National Institutes of Health	QLQ-30	quality of life questionnaire 30 items
NIH-AARP	National Institutes of Health-American Association of Retired Persons	QoL	quality of life
NMDA	N-methyl-D-aspartate	RCT	randomized controlled trial
NMR	nicotine metabolite ratio	RE-AIM	Reach, Effectiveness, Adoption, Implementation, and Maintenance
NQF	National Quality Forum	RIVM	chronic disease model developed at the National Institute of Public Health and the Environment in The Netherlands
NRT	nicotine replacement therapy	RNA	ribonucleic acid
NSDUH	National Survey on Drug Use and Health	RR	relative risk
NTCP	National Tobacco Control Program	RR	risk ratio
NYTS	National Youth Tobacco Survey	RSE	relative standard error
OACIS	Osaka Acute Coronary Insufficiency Study	RV	residual volume
OASIS	Organization to Assess Strategies in Ischemic Syndromes	Rx	prescription product
OFC	orbitofrontal cortex	SAH	subarachnoid hemorrhage
OR	odds ratio	SAMMEC	Smoking-Attributable Mortality, Morbidity and Economic Costs
OTC	over the counter	SAST	serum aspartate amino transferase
PAD	peripheral artery disease	SAVE	Sleep Apnea Cardiovascular Endpoints Trial
PAM	positive allosteric modulator	SBRT	stereotactic body radiation therapy
PAS	pharmacists action on smoking	SCD	sudden cardiac death
PATH	Population Assessment of Tobacco and Health	SCHIP	State Children's Health Insurance Program
PCASRM	Practice Committee of American Society for Reproductive Medicine	SCQoL	Smoking Cessation Quality of Life
PCC	posterior cingulate cortex	SD	standard deviation
PCI	percutaneous coronary intervention	SDT	self-determination therapy
PCS	Physical Component Summary	SE	standard error
PEF	peak expiratory flow	SENECA	Survey Europe on Nutrition in the Elderly
PEFR	peak expiratory flow rate	sEng	soluble endoglin
PET	positron emission tomography	SF	Short Form [survey]
PFC	prefrontal cortex	sFlt-1	soluble fms-like tyrosine kinase 1
PHS	U.S. Public Health Service	SGA	small-for-gestational age
PIGF	placental growth factor	SHARE	Survey of Health, Aging, and Retirement in Europe
PLCO	Prostate, Lung, Colorectal, and Ovarian cancer screening	SMC	Swedish Mammography Cohort
PMTA	Premarket Tobacco Product Application	SMS	short text message
po	by mouth	SNP	single nucleotide polymorphism
PPROM	preterm premature rupture of the membranes	SNpc	substantia nigra pars compacta
PPTg	pedunculo-pontine tegmental nucleus		

SP-A	surface protein A	USDHHS	U.S. Department of Health and Human Services
SR	sustained release	USPSTF	U.S. Preventive Services Task Force
sRAGE	soluble Receptor for Advanced Glycation End [product]	VA	U.S. Department of Veterans Affairs
SYNTAX	Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery Trial	VascuQoL	Vascular Quality of Life [questionnaire]
TDD	telecommunications device for the deaf	VC	vital capacity
THC	tetrahydrocannabinol	VEGF	vascular endothelial growth factor
TLC	total lung capacity	VLNC	very-low-nicotine-content
TPSAC	Tobacco Product Scientific Advisory Committee	VTA	ventral tegmental area
TUS-CPS	Tobacco Use Supplement to the Current Population Survey	VTE	venous thromboembolism
UCSD	University of California–San Diego	WHO	World Health Organization
UK	United Kingdom	WHOQoL-BREF	World Health Organization Quality of Life-BREF
USAF	United States Air Force	WPS	Work Performance Scale
USDHEW	U.S. Department of Health, Education, and Welfare	xCT	cystine/glutamate exchanger
		YRBS	Youth Risk Behavior Survey
		YRBSS	Youth Risk Behavior Surveillance System

List of Tables and Figures

Executive Summary¹

Figure ES.1 Trends in prevalence (%) of current and former cigarette smoking among adults 18 years of age and older, by sex; National Health Interview Survey (NHIS) 1965–2017; United States 2

Chapter 1. Introduction, Conclusions, and the Evolving Landscape of Smoking Cessation

Figure 1.1 Trends in prevalence (%) of current and former cigarette smoking among adults 18 years of age and older, by sex; National Health Interview Survey (NHIS) 1965–2017; United States 4

Chapter 2. Patterns of Smoking Cessation Among U.S. Adults, Young Adults, and Youth

Table 2.1 Sources of national survey data on smoking cessation used for this report, 1965–2017; United States 38

Table 2.2 Distribution of selected demographic characteristics of adult current cigarette smokers 18 years of age and older; National Health Interview Survey (NHIS) 2000, 2005, 2010, 2015, and 2017; United States 49

Table 2.3 Distribution of tobacco use characteristics among adult current cigarette smokers 18 years of age and older; National Health Interview Survey (NHIS) 2000, 2005, 2010, 2015, and 2017; United States 52

Table 2.4 Distribution of selected demographic characteristics of young adult current cigarette smokers 18–24 years of age; National Health Interview Survey (NHIS) 2000, 2005, 2010, 2015, and 2017; United States 53

Table 2.5 Distribution of tobacco use characteristics of young adult current cigarette smokers 18–24 years of age; National Health Interview Survey (NHIS) 2000, 2005, 2010, 2015, and 2017; United States 54

Table 2.6 Distribution of demographic characteristics of high school students who are frequent cigarette smokers; National Youth Risk Behavior Survey (YRBS) 2001, 2005, 2009, 2015, and 2017; United States 55

Table 2.7 Prevalence of use of other tobacco products among high school students who are frequent cigarette smokers; National Youth Risk Behavior Survey (YRBS) 2001, 2005, 2009, 2015, and 2017; United States 56

Table 2.8 Prevalence of use of menthol cigarettes among high school students who currently smoke cigarettes, by frequency of smoking; National Youth Tobacco Survey (NYTS) 2000, 2004, 2009, 2015, and 2017; United States 56

Table 2.9 Percentage of ever cigarette smokers 18 years of age and older who have recently successfully quit and quit smoking (quit ratio), by selected characteristics; National Health Interview Survey (NHIS) 2017; United States 62

Table 2.10 Percentage of current and ever smokers 18 years of age and older who quit smoking (quit ratio) and prevalence of recent successful cessation and a past-year quit attempt, by state; Behavioral Risk Factor Surveillance System (BRFSS) 2017; United States 63

Table 2.11 Prevalence of a past-year quit attempt and interest in quitting smoking among adult cigarette smokers 18 years of age and older, by selected characteristics; National Health Interview Survey (NHIS) 2015; United States 68

Table 2.12 Prevalence of a past-year quit attempt among adult current cigarette smokers 18 years of age and older, by selected smoking-related and demographic characteristics; National Health Interview Survey (NHIS) 2015; United States 69

Table 2.13a Quitting behaviors among current cigarette smokers in high school (grades 9–12); National Youth Tobacco Survey (NYTS) 2000, 2004, 2009, 2015, and 2017; United States 72

Table 2.13b Quitting behaviors among current cigarette smokers in middle school (grades 6–8); National Youth Tobacco Survey (NYTS) 2000, 2004, 2009, 2015, and 2017; United States 73

Table 2.14 Quitting behaviors among current cigarette smokers 18 years of age and older, by year; Tobacco Use Supplement to the Current Population Survey (TUS-CPS) 2001–2002, 2006–2007, 2010–2011, and 2014–2015; United States 76

¹The Executive Summary is not part of the main report. Instead, it is available online at <https://www.hhs.gov/surgeongeneral/reports-and-publications/index.html>

Table 2.15	Quitting behaviors among current cigarette smokers 18–24 years of age, by year; Tobacco Use Supplement to the Current Population Survey (TUS-CPS) 2001–2002, 2006–2007, 2010–2011, 2014–2015; United States 77	Table 2.24	Prevalence of using strategies to quit cigarette smoking among current cigarette smokers 18 years of age and older who tried to quit during the past year, by selected characteristics; Tobacco Use Supplement to the Current Population Survey (TUS-CPS) 2014–2015; United States 96
Table 2.16	Prevalence of cessation behaviors and attitudes among high school seniors who are current cigarette smokers; Monitoring the Future (MTF) Study 2011–2017 combined data; United States 79	Table 2.25	Strategies used to quit smoking among high school and middle school current cigarette smokers who tried to quit during the past year; National Youth Tobacco Survey (NYTS) 2000, 2004, 2009, and 2015; United States 97
Table 2.17	Prevalence of cessation behaviors and attitudes among high school seniors who are current cigarette smokers, by year; Monitoring the Future (MTF) Study 2000–2004, 2005–2009, 2010–2014, and 2015–2017 combined data; United States 80	Table 2.26	Percentage of ever cigarette smokers 18 years of age and older who quit smoking (quit ratio) and prevalence of recent successful cessation and a past-year quit attempt, by urban or rural status; Behavioral Risk Factor Surveillance System (BRFSS) 2017; United States 101
Table 2.18	Prevalence of a past-year quit attempt for cigarette smoking and all tobacco use by type of tobacco used among adult current tobacco users 18 years of age and older, by selected demographic characteristics; National Health Interview Survey (NHIS) 2012–2014; United States 83	Figure 2.1	Trends in prevalence (%) of current and former cigarette smoking among adults 18 years of age and older, by sex; National Health Interview Survey (NHIS) 1965–2017; United States 44
Table 2.19	Quitting behaviors among current users of two or more tobacco products, by grade in school; National Youth Tobacco Survey (NYTS) 2017; United States 85	Figure 2.2	Trends in prevalence (%) of current and former cigarette smoking among adults 18 years of age and older, by race/ethnicity; National Health Interview Survey (NHIS) 1965–2017; United States 44
Table 2.20	Receipt of screening for tobacco use, counseling, and a prescription for a cessation medication during outpatient visits to office-based physicians among adults 18 years of age and older, by patient and physician characteristics; National Ambulatory Medical Care Survey (NAMCS) 2009–2011 combined data; United States 87	Figure 2.3	Trends in prevalence (%) of current and former cigarette smoking among young adults 18–24 years of age, by sex; National Health Interview Survey (NHIS) 1965–2017; United States 45
Table 2.21	Prevalence of receiving a health professional’s advice to quit smoking and use of counseling and medications for cessation among cigarette smokers 18 years of age and older, by selected characteristics; National Health Interview Survey (NHIS) 2015; United States 89	Figure 2.4	Trends in prevalence (%) of current and former cigarette smoking among young adults 18–24 years of age, by race/ethnicity; National Health Interview Survey (NHIS) 1965–2017; United States 46
Table 2.22	Prevalence of interest in quitting, past-year quit attempt, receipt of a health professional’s advice to quit, use of counseling and/or medication, quit ratio, and recent successful cessation among smokers 18 years of age and older, by selected subpopulations; National Health Interview Survey (NHIS) 2015, 2017; United States 91	Figure 2.5	Trends in prevalence (%) of current frequent, former daily, and former nondaily cigarette smoking among high school students; National Youth Risk Behavior Survey (YRBS) 1991–2017; United States 47
Table 2.23a	Prevalence of being asked about tobacco use and being advised not to use tobacco among high school students (grades 9–12) who saw a healthcare provider during the past year, by grade in school; National Youth Tobacco Survey (NYTS) 2015; United States 94	Figure 2.6a	Trends in prevalence (%) of current frequent cigarette smoking among high school students, by race/ethnicity; National Youth Risk Behavior Survey (YRBS) 1991–2017; United States 48
Table 2.23b	Prevalence of being asked about tobacco use and being advised not to use tobacco among middle school students (grades 6–8) who saw a healthcare provider during the past year, by grade in school; National Youth Tobacco Survey (NYTS) 2015; United States 94	Figure 2.6b	Trends in prevalence (%) of former daily and former nondaily cigarette smoking among high school students, by race/ethnicity; National Youth Risk Behavior Survey (YRBS) 1991–2017; United States 48
		Figure 2.7a	Prevalence of current cigarette smoking by level of education and presence or absence of serious psychological distress and poverty status among adults 25 years of age and older; National Health Interview Survey (NHIS) 2017; United States 60

Figure 2.7b	Prevalence of current cigarette smoking by level of education and status of health insurance among adults 25 years of age and older; National Health Interview Survey (NHIS) 2017; United States 60
Figure 2.8a	Percentage of ever smokers 18 years of age and older who quit smoking (quit ratio), by age group; National Health Interview Survey (NHIS), 1965–2017; United States 65
Figure 2.8b	Percentage of ever smokers 18 years of age and older who quit smoking (quit ratio), by race/ethnicity; National Health Interview Survey (NHIS), 1965–2017; United States 65
Figure 2.9	Cessation continuum for current cigarette smokers 18 years of age and older; Tobacco Use Supplement to the Current Population Survey (TUS-CPS) 2006–2007, 2010–2011, 2014–2015; United States 67
Figure 2.10	Prevalence of past-year quit attempts among adult cigarette smokers 18 years of age and older, by sex; National Health Interview Survey (NHIS) 1997–2017; United States 74
Figure 2.11	Prevalence of past-year quit attempts among adult cigarette smokers 18 years of age and older, by race/ethnicity; National Health Interview Survey (NHIS) 1997–2017; United States 74
Figure 2.12	Prevalence of past-year quit attempts among students in grades 9–12 who currently smoke cigarettes, by sex; National Youth Risk Behavior Survey (YRBS) 2001–2015; United States 75
Figure 2.13	Prevalence of use of counseling or medications for cessation among adult smokers 18 years of age and older, by race/ethnicity; National Health Interview Survey (NHIS) 2000–2015; United States 98
Figure 2.14	Quarterly, inflation-adjusted dollar sales of over-the-counter nicotine replacement therapy, by type; Quarter 2, 2014–Quarter 4, 2018; United States 99

Chapter 3. New Biological Insights into Smoking Cessation

Table 3.1	Current pharmacotherapies for smoking cessation 130
Table 3.2	Novel pharmacologic targets for smoking cessation 133
Figure 3.1	Stages of the addiction cycle 127
Figure 3.2	Structure and properties of nAChRs 128
Figure 3.3	Neuronal mechanisms involved in nicotine addiction: A model 145

Chapter 4. The Health Benefits of Smoking Cessation

Table 4.1	Conclusions from the 1990 Surgeon General's report on the health benefits of smoking cessation and cancer 178
Table 4.2	Relative risk of lung cancer incidence or mortality by number of years since smoking cessation, compared with continued smoking, in three large U.S. cohorts 181
Table 4.3	Relative risk of lung cancer incidence or mortality by number of years since smoking cessation, compared with never smokers, in three large U.S. cohorts 182
Table 4.4	Cohort studies of stomach cancer incidence or mortality, by number of years since smoking cessation 183
Table 4.5	Cohort studies of colorectal cancer incidence or mortality, by number of years since smoking cessation 189
Table 4.6	Studies of liver cancer incidence or mortality, by number of years since smoking cessation 196
Table 4.7	Studies of cervical cancer incidence by years since smoking cessation 198
Table 4.8	Studies of kidney cancer incidence by number of years since smoking cessation 200
Table 4.9	Cohort studies that compared all-cause mortality in persons who were smokers at the time of a cancer diagnosis but had quit smoking after the diagnosis with those who continued smoking after the diagnosis 208
Table 4.10	Conclusions from previous Surgeon General's reports on smoking cessation and cardiovascular disease 215
Table 4.11	Studies on the association between smoking cessation and subclinical atherosclerosis 221
Table 4.12	Meta-analyses of observational studies on smoking cessation and incidence of total cardiovascular disease 228
Table 4.13	Observational studies on smoking cessation and cardiovascular disease 231
Table 4.14	Meta-analyses and a pooled analysis of observational studies on smoking cessation and incidence of coronary heart disease 235
Table 4.15	Observational studies on smoking cessation and incident coronary heart disease 237
Table 4.16	Observational studies (meta-analyses and pooled analyses) on smoking cessation and cerebrovascular disease 240
Table 4.17	Observational studies on smoking cessation and cerebrovascular disease 244

Table 5.3	Prospective studies of populations undergoing cessation treatment	451	Table 7.2	Systems-level changes reviewed in the 2008 <i>Clinical Practice Guideline</i> to encourage smoking cessation	584
Table 5.4	Prospective studies of special populations	454	Table 7.3	<i>Affordable Care Act</i> guidance of coverage of tobacco cessation treatment	589
Table 5.5a	Relative risks by smoking status and age group among adult men 35 years of age and older, United States	463	Table 7.4	Models of comprehensive tobacco cessation coverage and health insurance benefits	591
Table 5.5b	Relative risks by smoking status and age group among adult women 35 years of age and older, United States	464	Table 7.5	Healthcare system approaches designed to encourage smoking cessation	593
Table 5.6	Summary of economic evaluations of nicotine-based pharmacotherapies for smoking cessation	469	Figure 7.1	CDC's conceptual population health and prevention framework	581
Table 5.7	Summary of economic evaluations of non-nicotine-based pharmacotherapies for smoking cessation	474	Figure 7.2	Intensity of ad placement for <i>Tips From Former Smokers (Tips)</i> campaign and call volume to 1-800-QUIT-NOW, 2013	604
Table 5.8	Summary of economic evaluations of brief counseling for smoking cessation	478	Figure 7.3	Pictorial warning on cigarette packages in Australia	608
Table 5.9	Summary of economic evaluations of nonclinical interventions for smoking cessation	483	Figure 7.4	Effects of individual and combined policies on the prevalence of smoking among men and women 18 years of age and older, using the SimSmoke Model	615
Figure 5.1a	Incidence rate ratios for death from any cause, by smoking status	462			
Figure 5.1b	Incidence rate ratios for death from lung cancer, by smoking status	462			

Chapter 6. Interventions for Smoking Cessation and Treatments for Nicotine Dependence

Table 6.1	The 5 A's model for treating tobacco use and dependence	502
Table 6.2	Pharmacologic product guide: FDA-approved medications for smoking cessation	510
Figure 6.1	The evolution of e-cigarettes, by product generation and characteristics	525

Chapter 7. Clinical-, System-, and Population-Level Strategies that Promote Smoking Cessation

Table 7.1	Summary of policies from the 2014 Surgeon General's report that encourage smoking cessation	580
-----------	---	-----

Chapter 8. A Vision for the Future

Table 8.1	Summary of milestones aimed at increasing tobacco cessation in the United States	645
Table 8.2	Potential end-game strategies discussed in the 50th anniversary Surgeon General's report, 2014	654
Figure 8.1	Per capita annual cigarette consumption among adults, 18 years of age and older, and major smoking and health events in the United States, 1900–2017	644



U.S. Department of Health and Human Services