# Contents

# SECTION ONE: INTRODUCTION

# Cancer Epidemiology: Implications for Prevention, Early Detection, and Treatment 1

Suzanne M. Mahon

Overview, 1
Types of Epidemiology, 2
Risk Assessment, 5
Levels of Cancer Prevention, 6
Accuracy of Screening Tests, 7
Cancer Screening Recommendations, 8
Means to Express Cancer Prognosis and Outcomes, 9
Ethnic Differences, 10
Epidemiology Resources, 11
Conclusion, 11

#### Cancer Pathophysiology 13

Carolee Polek

Normal Cellular Biology, 13 Carcinogenesis, 15 Causes of Malignant Transformation, 18 Malignancy Quantification, 22 Conclusion, 23

#### Cancer Genetics 25

Suzanne M. Mahon

Molecular Genetics, 25 DNA Synthesis, 25 Protein Synthesis, 27 Neoplasia, 27 Germline and Somatic Mutations, 29 Pharmacogenomics, 32 Conclusion, 33

# SECTION TWO: MAJOR CANCERS

#### **Breast Cancer 35**

Nicole Korak

Invasive Breast Cancer, 35 Noninvasive Breast Cancer, 39

#### Central Nervous System Cancers 41

Margaretta S. Page and Jane Rabbitt

Overview of Central Nervous System Malignancies, 41 Astrocytoma, 43 Benign Brain Tumors, 45 Ependymoma, 46 Metastatic Brain Tumors, 47 Mixed Glioma, 47 Oligodendroglioma, 48 Primitive Neuroectodermal Tumor, 50 Recurrent Glial Tumor, 50

# **Gastrointestinal System Cancers** 52

Anal Cancer, 52 Lisa Parks

Cholangiocarcinoma and Gallbladder Cancer, 53

Lisa Parks

Colon and Rectal Cancer, 55 *Carolyn Grande* Esophageal Cancer, 58

Brenda Keith

Gastric Cancer, 61

Gastrointestinal Stromal Tumor, 63 *Lisa Parks* 

Hepatocellular Carcinoma, 65

Lisa Parks

Pancreatic Cancer, 66

Lisa Parks

## **Genitourinary Cancers** 69

Francisco A. Conde and Tyler Workman

Bladder Cancer, 69 Kidney Cancer, 71 Penile Cancer, 73 Prostate Cancer, 74 Testicular Cancer, 77

## Gynecologic Cancers 81

Paula Anastasia

Cervical Cancer, 81 Ovarian Cancer, 84 Uterine Cancer, 87 Vaginal Cancer, 89 Vulvar Cancer, 91

#### Head and Neck Cancers 93

Ray Scarpa

Laryngeal Cancer, 93 Oral Cavity Cancer, 95 Pharyngeal Cancer, 98 Salivary Gland Cancer, 100 Thyroid and Parathyroid Tumors, 102

#### Leukemias 105

Kristen Hurley

Acute Lymphocytic Leukemia, 105 Acute Myelogenous Leukemia, 107 Chronic Lymphocytic Leukemia, 109 Chronic Myelogenous Leukemia, 111 Myelodysplastic Syndromes, 113

#### Lung Cancers 116

Carrie H. Christiansen

Non-Small Cell Lung Cancer, 116 Small Cell Lung Cancer, 118 Malignant Pleural Mesothelioma, 120

## Lymphomas 122

Amy Goodrich

Hodgkin Lymphoma, 122 Non-Hodgkin Lymphoma, 125

#### Multiple Myeloma 129

Sandra Kurtin

Definition, 129
Incidence, 129
Etiology and Risk Factors, 129
Signs and Symptoms, 129
Diagnostic Work-up, 129
Clinical Staging, 130
Treatment, 130
Prognosis, 132
Prevention and Surveillance, 132

#### Myelofibrosis 134

Kristen Hurley

Definition, 134
Incidence, 134
Etiology and Risk Factors, 134
Signs and Symptoms, 134
Diagnostic Work-up, 134
Histology, 135
Clinical Staging, 135
Treatment, 135
Prognosis, 136
Prevention and Surveillance, 136

## **Neuroendocrine Cancers** 137

Nicole Korak

Definition, 137 Incidence, 137 Etiology and Risk Factors, 137 Signs and Symptoms, 138 Diagnostic Work-up, 139 Histology, 140 Clinical Staging, 140 Treatment, 140 Prognosis, 141 Prevention and Surveillance, 142

#### Sarcomas 143

Rupa Ghosh-Berkebile

Chondrosarcoma, 143 Ewing Sarcoma Family of Tumors, 145 Osteosarcoma, 148 Soft Tissue Sarcoma, 151

#### Skin Cancers 157

Barbara Smelko

Melanoma, 157 Nonmelanoma Skin Cancer: Basal Cell Carcinoma and Squamous Cell Carcinoma, 159

# SECTION THREE: PRINCIPLES OF CANCER MANAGEMENT

# Surgical Therapy 163

Lisa Parks

Goals of Surgical Procedures, 163
Surgical Preoperative Evaluation, 163
Preoperative Medication Guidelines, 164
Perioperative Nursing Care, 165
Postoperative Nursing Care, 165
Reconstruction, 166
Palliation, 166
Conclusion, 166

# Radiation Therapy 168

Lorraine Drapek

Definition, 168
Radiobiology, 168
Radiation Delivery, 168
Measuring Radiation Dose, 170
The Role of Radiation in Cancer Care, 170
Side Effects, 170

## **Tumor Treating Fields** 172

Laura Benson

Definition of TTFields, 172
TTFields Therapy System, 173
TTFields Therapy for Recurrent Glioblastoma, 174
Newly Diagnosed GBM, 174
Patient and Caregiver Education before TTFields
Therapy, 174
Ongoing Research with TTFields, 177
Additional Information, 177
Other Solid Tumors, 177

## Hematopoietic Stem Cell Transplantation 179

Terry Wikle Shapiro

Introduction, 179

Overview of the Process and Implications for Nursing Care, 180

Stem Cell Harvesting, Mobilization, and Collection, 183 Conditioning Therapy and Preparative Regimen, 185 Stem Cell Infusion, 186

Early Complications of Stem Cell Transplantation, 187 Sinusoidal Obstructive Syndrome of the Liver, 192

Pulmonary Complications, 193

Engraftment and Recovery, 194

Posttransplantation Relapse, 201

# Chemotherapy 206

Anna Christofanelli

Biologic and Pharmacologic Bases for Cancer Chemotherapy, 206

Cell Cycle Specificity and Chemotherapy, 207

Chemotherapy Classifications, 207

Patient and Family Assessment and Preparation, 214

Safe Handling, 214

Routes of Administration, 217

Administration in Special Populations, 219

Conclusion, 220

# Immunotherapy 221

Sandra Remer

Overview, 221

Cytokines, 224

Gene Therapy, 227

Cancer Vaccines, 231

Checkpoint Inhibitors, 232

#### Targeted Therapy 236

Sandra Remer

Introduction, 236

Targeted Therapy Mechanism of Action, 237

Antiangiogenesis, 239

Monoclonal Antibodies, 242

Epidermal Growth Factor Inhibitors, 243

Epidermal Growth Factor—Tyrosine Kinase, 244

Toxicities, 245

Conclusion, 247

## **Hormonal Therapy** 249

Debbie Winkeljohn

Introduction, 249

Adrenocorticoids, 249

Androgens, 249

Antiandrogens, 249

Antiestrogens, 249

Gonadotropin-Releasing Hormone Agonists, 251

Gonadotropin-Releasing Hormone Antagonists, 251

Progestins, 252

Conclusion, 252

# Adherence and Persistence with Oral Therapies 253

Jody Pelusi

Introduction, 253

The Current Landscape of Oral Oncology-Hematology

Therapies, 253

Patient Assessment: Initial and Ongoing, 254

Treatment Plan, 254

Informed Consent Process, 254

Patient Education, 255

Measurement of Adherence, 255

Conclusion, 256

# Complementary and Alternative Therapies 257

Georgia Decker

Introduction, 257

Use of Complementary and Alternative Medicine, 257

Complementary and Alternative Medicine

Approaches, 258

Levels of Evidence, 258

The Internet, 258

Alternative Medical Systems, 260

Manipulative and Body-Based Methods, 262

Energy Therapies, 262

Mind-Body Interventions, 263

Aromatherapy, 264

Movement Therapies, 264

Nutritional Therapeutics, 265

Pharmacologic and Biologic Therapies, 267

Conclusion, 270

#### Clinical Trials 273

Marlon Garzo Saria

Introduction, 273

Drug Development Process, 273

Types of Clinical Trials, 273

Phases of Clinical Trials, 273

Components of a Clinical Trial, 275

Clinical Research Team, 275

Clinical Trial Protocol, 275

Eligibility Criteria, 276

End Points, 277

Randomization, 278

Considerations for Nursing Care, 278

# SECTION FOUR: PRINCIPLES OF SYMPTOM MANAGEMENT

# **Oncology Symptoms** 279

Alopecia, 279

Wendy Vogel

Anorexia, 280

Kristin A. Cawley

Anxiety, 282

Denice Economou

Arthralgias and Myalgias, 284

Carol S. Blecher

Confusion, 286

Carol S. Blecher

Constipation, 288

Carolyn Grande

Cough, 290

Ruth Canty Gholz

Depressed Mood, 292

Denice Economou

Diarrhea, 294

Carolyn Grande

Dizziness and Vertigo, 297

Ruth Canty Gholz

Dysphagia, 298

Kristin A. Cawley

Dyspnea, 299

Ruth Canty Gholz

Epistaxis, 300

Joshua Carter

Esophagitis, 302

Kristin A. Cawley

Fatigue, 303

Susie Newton

Fever, 305

Ruth Canty Gholz

Flu-like Symptoms, 306

Ruth Canty Gholz

Hand-Foot Syndrome, 308

Laura S. Wood

Headache, 309

Carol S. Blecher

Hiccups, 312

Denice Economou

Hyperglycemia, 313

Deborah Kirk Walker

Hypersensitivity Reactions, 315

Colleen O'Leary

Hypertension, 317

Deborah Kirk Walker

Lymphedema, 319

Wendy H. Vogel

Menopausal Symptoms, 321

Wendy H. Vogel

Mucositis, 323

Kristin A. Cawley

Nail Changes, 325

Colleen O'Leary

Nausea and Vomiting, 327

Carolyn Grande

Ocular and Visual Changes, 330

Colleen O'Leary

Pain, 333

Denice Economou

Peripheral Neuropathy, 337

Carol S. Blecher

Pleural Effusion, 339

Pamela Gamier

Pruritus and Xerosis, 341

Denice Economou

Rash, 343

Laura S. Wood

Seizures, 345

Carol S. Blecher

Sexuality Alterations, 347

Wendy H. Vogel

Sleep Disturbances, 350

Wendy H. Vogel

Xerostomia, 352

Kristin A. Cawley

# SECTION FIVE: ONCOLOGIC EMERGENCIES

# Structural Emergencies 355

Jennifer S. Webster

Bowel Obstruction, 355

Increased Intracranial Pressure, 356

Neoplastic Cardiac Tamponade, 358

Radiation Pneumonitis, 359

Spinal Cord Compression, 360

Superior Vena Cava Syndrome, 361

# **Urologic Emergencies 363**

Jennifer S. Webster

Cystitis, 363

Urinary Tract Infection, 364

Urinary Tract Obstruction, 365

#### Metabolic Emergencies 367

Kristen W. Malonev

Adrenal Failure, 367

Hypercalcemia of Malignancy, 369

Hypoglycemia, 370

Syndrome of Inappropriate Antidiuretic Hormone, 372

Tumor Lysis Syndrome, 374

# Hematologic Emergencies 377

Jeanene "Gigi" Robison

Deep Vein Thrombosis, 377

Disseminated Intravascular Coagulation, 380

Hemolytic Uremic Syndrome, 384

Pulmonary Embolism, 388

Sepsis, 391

Thrombotic Thrombocytopenic Purpura, 394

# SECTION SIX: PALLIATIVE CARE AND END-OF-LIFE ISSUES

#### Survivorship 399

Carrie Tompkins Stricker and Carrie Tilley

Introduction, 399

Evolution of Survivorship Care, 400

What Is Survivorship Care? 400

Models of Survivorship Care, 402

Lost Between Primary Care and Oncology: Who Is

Responsible? 402

Scope of a Survivorship Care Plan, 402

Future of Cancer Survivorship:

Opportunity for Nurses, 408

#### Palliative Care 410

Debra E. Heidrich

Introduction, 410

Definition, 410

Palliative Care in Persons with Cancer, 411

Models of Palliative Care Delivery, 411

Hospice and Palliative Care, 411

#### Final Hours 413

Mary Murphy and Trechia Gross

Introduction, 413

Nursing Considerations before Death, 413

Palliative Therapy Options for End-of-Life Patients, 414

Nursing Care after Death, 414

Last-Minute Concerns, 414

#### Loss, Grief, and Bereavement 415

Debra E. Heidrich

Introduction, 415

Definition, 415

Normal Manifestations of Grief, 415

Grief Theories, 415

Complicated Grief, 416

Support and Counseling, 416

# SECTION SEVEN: NURSING PRACTICE CONSIDERATIONS

#### Communication 417

Lisa Kennedy Sheldon

Communication Skills, 417

Information Sharing, 417

Psychosocial and Emotional Responses, 418

Assessment of Psychosocial Concerns, 418

Responding to Emotions, 418

Uncertainty, 419

Transition to Palliative Care, 419

Caring for the Clinician, 420 Conclusion, 420

#### **Cultural Considerations** 421

Joanne Itano

Definition of Culture, 421

Providing Culturally Competent Care, 421

Assessment Model, 421

Barriers to Cultural Competence, 421

Cancer Disparities, 421

Strategies for Promoting Cultural Competence in the

Organization, 422

#### **Ethical Considerations** 423

Lisa Balster

Introduction, 423

Key Ethical Theories, 423

Key Ethical Principles, 423

Framework for Ethical Decision Making, 423

Effective Informed Consent, 423

Common Ethical Issues in Oncology, 424

Role of the Nurse in Ethical Decision Making, 424

Ethical Support for Nursing, 424

# Quality and Safety 425

Julie Ponto

Quality and Safety in Oncology, 425

Cancer Treatment-Specific Quality and Safety

Information, 425

Oncology Professional Organizations' Initiatives on

Quality and Safety, 426

General Health Care Quality and Safety Initiatives, 427

#### Evidence-Based Practice 429

Diane G. Cope

Definition, 429

Goals of Evidence-Based Practice, 429

Five Steps of Evidence-Based Practice, 429

Oncology Nursing Society Putting Evidence into

Practice, 430

Relevance of Evidence-Based Practice to Nursing Practice, 430

## Patient Navigation 431

Karyl Blaseg

Introduction, 431

Definitions of Patient Navigation, 431

Models of Patient Navigation, 431

Roles, Responsibilities, and Core Competencies, 432

Considerations for Building a Successful Navigation

Program, 433

Outcomes and Performance Measures, 434

Future of Navigation, 434

#### Patient Education 436

Leah A. Scaramuzzo

What Are the Challenges of Providing Patient Education? 436 Mandates and Standards for Patient Education, 436 Education Theory, 437 Health Literacy, 438 Health Education Materials, 438 Tools for Assessing Health Literacy, 439 Using Technology in Patient Education, 439

Index, 443

SECTION SIX: PALLIABLYE CARE