

# Contents

**Preface** ..... **xi**  
**Acknowledgments** ..... **xiii**  
**Contributors** ..... **xiv**

**SECTION ONE Historical and Work Perspectives** **1**

**Chapter 1 The International Board Certified Lactation Consultant® (IBCLC®) and the Healthcare Team** ..... **3**

History ..... 4  
 Do IBCLCs Make a Difference? ..... 5  
 Pathways to Become Certified as an IBCLC ..... 5  
 Formal and Continuing Education Programs for IBCLCs and Lactation Support Providers ..... 7  
 Practice-Guiding Documents ..... 7  
 Ethics ..... 8  
 Legal Issues ..... 8  
 Avoid Civil Liability ..... 9  
 Confidentiality ..... 9  
 Hospital Lactation Services ..... 9  
 Managing a Hospital Lactation Service ..... 13  
 Orientation and Documentation ..... 14  
 Education, Advocacy, and Collaboration ..... 14  
 Professional Lactation Care and Volunteer or Paid Peer Counselors ..... 15  
 Breastfeeding Support in the Community ..... 15  
 Summary ..... 16  
 Key Concepts ..... 16  
 References ..... 17

**Chapter 2 Breastfeeding and Lactation: Roots and Wings** ..... **21**

Introduction ..... 21  
 Human Evolution: Shared Parenting and Lactation ..... 22  
 United States Policy ..... 33

The Rise of Breastfeeding ..... 35  
 Challenges Going Forward:  
 The Breastfeeding Conundrum ..... 38  
 Summary ..... 42  
 Key Concepts ..... 43  
 References ..... 43

**SECTION TWO Anatomic and Biological Imperatives** **47**

**Chapter 3 Anatomy and Physiology of Lactation** ..... **49**

Introduction ..... 49  
 Mammogenesis ..... 49  
 Breast Structure ..... 50  
 Pregnancy ..... 54  
 Clinical Implications: Mother ..... 63  
 Newborn Oral Development ..... 65  
 Sucking ..... 67  
 Frequency of Feedings ..... 72  
 Summary ..... 73  
 Key Concepts ..... 74  
 Internet Resources ..... 75  
 References ..... 75  
 Appendix 3-A ..... 80  
 References ..... 83

**Chapter 4 The Composition and Specificity of Human Milk** ..... **85**

Milk Synthesis and Maturation Changes ..... 86  
 Energy, Volume, and Growth ..... 87  
 Nutritional Values ..... 92  
 Bioactive Components ..... 99  
 The Immune System ..... 104  
 Preterm Milk ..... 107

Anti-Infective Properties ..... 107  
 Implications for Clinical Practice ..... 114  
 Summary..... 115  
 Key Concepts..... 115  
 Acknowledgment ..... 116  
 References ..... 116

**Chapter 5 Drug Therapy and Breastfeeding ..... 127**

Introduction..... 127  
 The Alveolar Subunit ..... 128  
 Drug Transfer into Human Milk..... 129  
 Calculating Infant Exposure..... 132  
 Effect of Medications on Milk Production ..... 134  
 Review of Selected Drug Classes..... 137  
 Illicit Substances..... 149  
 Radioactive Agents ..... 150  
 Summary..... 150  
 Key Concepts..... 151  
 References ..... 151

**Chapter 6 Viral Infections and Breastfeeding ..... 159**

Introduction..... 159  
 Human Immunodeficiency Virus..... 160  
 Herpes Simplex Virus ..... 162  
 Varicella-Zoster Virus (Chickenpox/Varicella/Zoster/Shingles) ..... 164  
 Cytomegalovirus ..... 165  
 Rubella ..... 166  
 Hepatitis B..... 166  
 Hepatitis C..... 168  
 Human T-Cell Lymphotropic Viruses ..... 168  
 Arboviruses..... 169  
 Ebola Virus..... 170  
 Implications for Practice ..... 170  
 Acknowledgments ..... 170  
 Summary..... 171  
 Key Concepts..... 171  
 Internet Resources..... 172  
 References ..... 172

**SECTION THREE Prenatal, Perinatal, and Postnatal Periods 175**

**Chapter 7 Perinatal and Intrapartum Care .... 177**

Breastfeeding Preparation ..... 177  
 Early Feedings ..... 178  
 Stressful Births and Other Adverse Practices..... 181  
 Postbirth Care of the Newborn..... 182  
 Normal Newborn Sleep and Eating Patterns..... 183  
 Pain Medications ..... 185  
 Feeding Positions..... 186  
 The Infant Who Has Not Latched On ..... 188  
 Late-Preterm Infants..... 193  
 Feeding Methods..... 194  
 Hypoglycemia..... 196  
 Cesarean Birth..... 199  
 Breast Engorgement..... 199  
 Breast Edema..... 200  
 Hand Expression..... 201  
 Clinical Implications ..... 202  
 The Baby-Friendly Hospital Initiative ..... 205  
 Acknowledgment ..... 206  
 Summary..... 206  
 Key Concepts..... 206  
 Internet Resources..... 207  
 References ..... 208  
 Appendix 7-A..... 213  
 Appendix 7-B..... 214

**Chapter 8 Newborn Assessment ..... 215**

Introduction..... 215  
 Perinatal History ..... 215  
 Gestational Age Assessment..... 215  
 Indicators of Effective Breastfeeding and Assessment Scales..... 221  
 Physical Assessment..... 226  
 Head ..... 232  
 Behavioral Assessment ..... 237  
 Neonatal Abstinence Syndrome ..... 241

Summary..... 242  
 Key Concepts..... 242  
 References ..... 242  
 Appendix 8-A..... 244  
 Appendix 8-B..... 244  
 Appendix 8-C..... 245

**Chapter 9 Postpartum Care ..... 247**

Immediate Postbirth Events..... 247  
 First Weeks: Principles and Expectations..... 248  
 Common Problems in the Early Days and Weeks... 249  
 Supplementation Guidelines and Cautions..... 253  
 Nipple Pain ..... 253  
 Engorgement + Milk Stasis = Involution..... 256  
 Milk Supply/Milk Production ..... 258  
 Breast Massage ..... 262  
 Nausea and Other Negative Feelings During  
 the Milk-Ejection ..... 262  
 Clothing, Leaking, Bras, and Breast Pads ..... 262  
 Infant Concerns ..... 262  
 Multiple Infants..... 266  
 Sleeping, SIDS, and Bed-Sharing ..... 269  
 Clinical Implications ..... 272  
 Summary..... 273  
 Key Concepts..... 273  
 Internet Resources..... 274  
 References ..... 274

**Chapter 10 Breast-Related Problems..... 281**

Introduction..... 281  
 Nipple Variations ..... 281  
 Plugged Ducts..... 283  
 Mastitis..... 284  
 Breast Abscess..... 288  
 Dermatoses of the Breast ..... 288  
 Candidiasis (Thrush) ..... 290  
 Other Breast Pain ..... 294  
 Milk Blister..... 295  
 Mammoplasty..... 295  
 Breast Lumps and Surgery ..... 300  
 Galactocele..... 301  
 Fibrocystic Changes of the Breast..... 301  
 Bleeding from the Breast..... 302  
 Breast Cancer..... 303  
 Clinical Implications ..... 306  
 Acknowledgment ..... 306

Summary..... 307  
 Key Concepts..... 307  
 Internet Resources..... 308  
 References ..... 308

**Chapter 11 Low Intake in the Breastfed Infant:  
 Maternal and Infant  
 Considerations..... 313**

Introduction..... 313  
 Global Standards for Optimal Growth: The  
 WHO Child Growth Standards ..... 315  
 The Relationship of Newborn Weight  
 Loss to Onset of Lactogenesis II and Other  
 Peripartum Risk Factors ..... 318  
 Initial Newborn Weight Loss and Early  
 Weight Gain ..... 321  
 Low Intake and Low Milk Supply: Definitions  
 and Incidence of Occurrence, Confusing  
 Terminology, Limited Data, and  
 Nonstandardized Research ..... 322  
 Abnormal Patterns of Growth: The Baby  
 Who Appears Healthy ..... 324  
 Abnormal Patterns of Growth: The Baby  
 with Obvious Illness ..... 335  
 Maternal Considerations: The Mother  
 Who Appears Healthy ..... 335  
 Maternal Considerations: Obvious Illness..... 340  
 History, Physical Exam, and Differential Diagnosis... 340  
 Clinical Management..... 340  
 Special Techniques for Management of  
 Low Intake or Low Supply ..... 343  
 Acknowledgment ..... 347  
 Summary..... 347  
 Key Concepts..... 347  
 Internet Resources..... 348  
 References ..... 348

**Chapter 12 Jaundice and the Breastfed  
 Baby ..... 355**

Etiologic and Epidemiologic Overview of  
 Jaundice ..... 355  
 Medical Diagnosis of the Jaundiced Infant ..... 357  
 Assessment of Jaundice ..... 359  
 Management of Hyperbilirubinemia ..... 360  
 Acknowledgment ..... 361  
 Summary..... 361  
 Key Concepts..... 362

Internet Resources.....	362
References .....	362

### **Chapter 13 Breast Pumps and Other Technologies ..... 365**

What Mothers Want .....	367
Breast Pumps.....	368
Pump Comparisons.....	370
Simultaneous and/or Sequential Pumping.....	374
Flanges.....	375
Contamination of Breast Pumps and Expressed Breastmilk.....	376
Cleaning Pumps.....	376
Maternal Concerns, Emotions, and Education Needs.....	377
When Pumps Cause Problems .....	378
Sample Guidelines for Pump Selection.....	378
Common Pumping Problems.....	379
Nipple Shields .....	381
Breast Shells .....	385
Feeding-Tube Devices .....	387
Summary.....	389
Key Concepts.....	389
Internet Resources for Mothers .....	392
Publications .....	392
Resources for Healthcare Providers.....	392
References .....	392

### **Chapter 14 The Use of Human Milk and Breastfeeding in the Neonatal Intensive Care Unit ..... 397**

Introduction.....	397
Informed Decision: Human Milk as a Medical Intervention.....	398
Mothers of Preterm Infants .....	400
Rates of Breastfeeding Initiation and Duration....	401
Evidence-Based Lactation Support Services.....	402
Initiation and Maintenance of Milk Supply .....	404
Maintaining Maternal Milk Volume.....	407
Human Milk Management.....	409
Optimization of Human Milk for Feeding.....	412
Methods of Milk Delivery .....	414
Nonnutritive Sucking at the Breast.....	416
Measuring Milk Transfer.....	421

Discharge Planning for Postdischarge Breastfeeding.....	426
Postdischarge Breastfeeding Management.....	428
Acknowledgment .....	429
Summary.....	429
Key Concepts.....	429
Internet Resources.....	430
References .....	430
Appendix 14-A .....	440

### **Chapter 15 Donor Milk Banking ..... 443**

Introduction.....	443
Use of Donor Milk .....	443
History of Donor Milk Banking .....	445
Donor Milk Today.....	447
Safety .....	452
Availability.....	453
Milk Banking Procedures.....	453
Informed Decision Making.....	456
Wet-Nursing, Informal Sharing, and Sale of Milk .....	456
For-Profit and Not-for-Profit Milk Banking .....	458
Research Findings on Donor Milk .....	458
Selected Case Studies .....	460
A Tribute to Mary Rose Tully.....	462
Summary.....	462
Key Concepts.....	462
Internet Resources.....	463
References .....	463
Appendix 15-A .....	467
References .....	467

## **SECTION FOUR Beyond Postpartum 469**

### **Chapter 16 Maternal Nutrition and Breastfeeding ..... 471**

Introduction.....	471
General Nutritional Assessment of the Lactating Mother or Parent .....	471
General Dietary Guidelines During Lactation.....	472
Calorie Restriction and Exercise .....	475
Special Circumstances That May Influence Dietary Needs During Lactation.....	475
Nutrient–Drug Interactions in Lactating Mothers and Parents.....	477

Key Concepts..... 479  
 References ..... 479

**Chapter 17 Women’s Health and Breastfeeding ..... 481**

Postpartum Health and Care ..... 481  
 Lactation, Fertility, Sexuality, and Contraception..... 483  
 Fertility ..... 484  
 Postpartum Well-Being and Sexual Health ..... 490  
 Women’s Health Across the Childbearing Years ..... 495  
 Acute Illnesses and Infections..... 509  
 Chronic Illnesses..... 514  
 Mood Disorders During Lactation..... 522  
 Autoimmune Diseases..... 526  
 Physically Challenged Mothers..... 530  
 Sensory Challenged Mothers ..... 533  
 Epilepsy (Seizure Disorders)..... 533  
 Surgery..... 534  
 Transplants ..... 535  
 Donating Blood ..... 535  
 The Impact of Maternal Illness and Hospitalization ..... 535  
 Acknowledgment ..... 536  
 Summary..... 536  
 Key Concepts..... 536  
 Internet Resources..... 538  
 References ..... 538

**Chapter 18 Maternal Employment and Breastfeeding ..... 549**

Introduction..... 549  
 Historical Perspective and Statistics on Maternal Employment ..... 549  
 The Effect of Work on Breastfeeding ..... 550  
 Facilitators and Barriers to Breastfeeding in the Workplace ..... 551  
 Individual Strategies to Manage Breastfeeding and Work ..... 552  
 Special Issues Related to Returning to Work..... 555  
 Workplace Strategies to Support Breastfeeding and Work ..... 560  
 Community Strategies to Support Breastfeeding and Work..... 565  
 National and Global Strategies in Promoting and Supporting Breastfeeding ..... 566  
 Clinical Implications ..... 569

Summary..... 570  
 Key Concepts..... 570  
 Internet Resources..... 571  
 References ..... 572

**Chapter 19 Child Health ..... 577**

Developmental Outcomes and Infant Feeding ..... 577  
 Oxytocin and Breastfeeding..... 581  
 Growth and Development..... 581  
 Theories of Development..... 585  
 Clinical Implications ..... 595  
 Immunizations ..... 596  
 Car Seat Safety..... 600  
 Vitamin D and Rickets..... 600  
 Dental Health and Orofacial Development ..... 601  
 Solid Foods..... 603  
 Obesity..... 607  
 Long-Term Breastfeeding ..... 609  
 Weaning ..... 609  
 Implications for Practice ..... 610  
 Acknowledgment ..... 610  
 Summary..... 610  
 Key Concepts..... 610  
 Internet Resources..... 611  
 References ..... 611

**Chapter 20 The Ill Child: Breastfeeding Implications..... 619**

Team Care for the Child with Feeding Difficulties..... 619  
 Feeding Behaviors of the Ill Infant/Child..... 620  
 What to Do If Weight Gain Is Inadequate..... 621  
 Pain Management Concerns..... 625  
 Breastfeeding Care of the Hospitalized Infant..... 625  
 Perioperative Care of the Breastfeeding Infant/Child ..... 627  
 Emergency Room ..... 627  
 Care of Children with Selected Conditions ..... 628  
 Alterations in Neurologic Functioning..... 634  
 Congenital Heart Disease ..... 639  
 Oral/Facial Anomalies..... 641  
 Gastrointestinal Anomalies and Disorders..... 646  
 Metabolic Dysfunction ..... 651

Allergies ..... 657  
 Food Intolerance ..... 658  
 Neonatal Abstinence Syndrome ..... 659  
 Psychosocial Concerns ..... 659  
 Acknowledgment ..... 663  
 Summary ..... 663  
 Key Concepts ..... 663  
 Internet Resources ..... 664  
 References ..... 664

**SECTION FIVE Sociocultural and Research Issues 675**

**Chapter 21 Research, Theory, and Lactation ..... 677**

Introduction ..... 677  
 Theories Related to Lactation Practice ..... 677  
 Origins of Research Methodologies ..... 681  
 Types of Research Methods ..... 682  
 Elements of Research ..... 687  
 Application of Methods  
     to Qualitative Approaches ..... 693  
 Application of Methods  
     to Quantitative Approaches ..... 695  
 Data Analysis ..... 699  
 Evaluating Research for Use in Practice ..... 703  
 Using Research in Clinical Practice ..... 705  
 Summary ..... 706  
 Key Concepts ..... 707  
 Internet Resources ..... 708  
 References ..... 708

**Chapter 22 Breastfeeding Education ..... 713**

Introduction ..... 713  
 Factors Creating the Need for Breastfeeding  
     and Lactation Education ..... 713  
 The Changing Landscape of Breastfeeding  
     Education ..... 714  
 Breastfeeding Programs for Healthcare  
     Professionals ..... 718  
 The Breastfeeding Team ..... 720  
 Parent Education ..... 723  
 Adult Learning Principles  
     and Education ..... 727  
 Curriculum Development ..... 729

Teaching Strategies ..... 730  
 Educational Materials ..... 732  
 Summary ..... 734  
 Key Concepts ..... 734  
 Resources ..... 735  
 References ..... 735

**Chapter 23 The Cultural Context of Breastfeeding ..... 739**

Introduction ..... 739  
 The Dominant Culture ..... 740  
 Ethnocentrism Versus Relativism and  
     Cultural Sensitivity ..... 741  
 Cultural Competence ..... 741  
 Assessing Cultural Practices ..... 742  
 Language Barriers ..... 744  
 The Effects of Culture on Breastfeeding ..... 745  
 Colostrum Discarding, Prelacteal Feeding,  
     and Timely Initiation of Breastfeeding ..... 748  
 Maternal Foods ..... 751  
 Weaning ..... 753  
 Implications for Practice ..... 754  
 Summary ..... 755  
 Key Concepts ..... 755  
 Internet Resources ..... 755  
 References ..... 756

**Chapter 24 The Familial and Social Context of Breastfeeding ..... 759**

Family Forms and Functions ..... 759  
 Family Theory ..... 760  
 Social Factors That Influence Breastfeeding ..... 760  
 Fathers ..... 763  
 The Adolescent Mother ..... 767  
 The Adoptive Mother and Family ..... 769  
 The Low-Income Family ..... 770  
 Breastfeeding During Pregnancy and  
     Tandem Nursing ..... 775  
 The Downside of Family Experience ..... 776  
 Summary ..... 780  
 Key Concepts ..... 780  
 Internet Resources ..... 780  
 Other Resources ..... 780  
 References ..... 781

**Index ..... 787**