

SIXTH EDITION

BREASTFEEDING *and* HUMAN LACTATION

Karen Wambach, PhD, RN, IBCLC, FILCA, FAAN

Professor

School of Nursing

University of Kansas

Kansas City, Kansas, USA

Becky Spencer, PhD, RN, IBCLC

Associate Professor

College of Nursing

Texas Woman's University

Denton, Texas, USA



JONES & BARTLETT
LEARNING



World Headquarters
Jones & Bartlett Learning
5 Wall Street
Burlington, MA 01803
978-443-5000
info@jblearning.com
www.jblearning.com

Jones & Bartlett Learning books and products are available through most bookstores and online booksellers. To contact Jones & Bartlett Learning directly, call 800-832-0034, fax 978-443-8000, or visit our website, www.jblearning.com.

Substantial discounts on bulk quantities of Jones & Bartlett Learning publications are available to corporations, professional associations, and other qualified organizations. For details and specific discount information, contact the special sales department at Jones & Bartlett Learning via the above contact information or send an email to specialsales@jblearning.com.

Copyright © 2021 by Jones & Bartlett Learning, LLC, an Ascend Learning Company

All rights reserved. No part of the material protected by this copyright may be reproduced or utilized in any form, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from the copyright owner.

The content, statements, views, and opinions herein are the sole expression of the respective authors and not that of Jones & Bartlett Learning, LLC. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not constitute or imply its endorsement or recommendation by Jones & Bartlett Learning, LLC, and such reference shall not be used for advertising or product endorsement purposes. All trademarks displayed are the trademarks of the parties noted herein. *Breastfeeding and Human Lactation, Sixth Edition*, is an independent publication and has not been authorized, sponsored, or otherwise approved by the owners of the trademarks or service marks referenced in this product.

There may be images in this book that feature models; these models do not necessarily endorse, represent, or participate in the activities represented in the images. Any screenshots in this product are for educational and instructive purposes only. Any individuals and scenarios featured in the case studies throughout this product may be real or fictitious, but are used for instructional purposes only.

The authors, editor, and publisher have made every effort to provide accurate information. However, they are not responsible for errors, omissions, or for any outcomes related to the use of the contents of this book and take no responsibility for the use of the products and procedures described. Treatments and side effects described in this book may not be applicable to all people; likewise, some people may require a dose or experience a side effect that is not described herein. Drugs and medical devices are discussed that may have limited availability controlled by the Food and Drug Administration (FDA) for use only in a research study or clinical trial. Research, clinical practice, and government regulations often change the accepted standard in this field. When consideration is being given to use of any drug in the clinical setting, the healthcare provider or reader is responsible for determining FDA status of the drug, reading the package insert, and reviewing prescribing information for the most up-to-date recommendations on dose, precautions, and contraindications, and determining the appropriate usage for the product. This is especially important in the case of drugs that are new or seldom used.

18997-1

Production Credits

VP, Product Management: Amanda Martin
Director of Product Management: Matthew Kane
Product Manager: Teresa Malmberg
Product Assistant: Melina Leon
Project Specialist: Kelly Sylvester
Project Specialist, Navigate: Kelly Sylvester
Digital Project Specialist: Angela Dooley
Senior Marketing Manager: Lindsay White
Product Fulfillment Manager: Wendy Kilborn

Composition: S4Carlisle Publishing Services
Cover Design: Kristin E. Parker
Media Development Editor: Troy Liston
Rights Specialist: John Rusk
Cover Image (Title Page, Part Opener, Chapter Opener): © Jasper Cole/Getty Images
Printing and Binding: Sheridan Books
Cover Printing: Sheridan Books

Library of Congress Cataloging-in-Publication Data

Names: Wambach, Karen, editor. | Spencer, Becky, editor.
Title: Breastfeeding and human lactation/[edited by] Karen Wambach, Becky Spencer.
Description: Sixth edition. | Burlington, Massachusetts : Jones & Bartlett Learning, [2021]
Identifiers: LCCN 2019015369 | ISBN 9781284151565 (hardback)
Subjects: | MESH: Breast Feeding | Infant Nutritional Physiological Phenomena | Lactation | Milk, Human
Classification: LCC RJ216 | NLM WS 125 | DDC 649/.33--dc23
LC record available at <https://lccn.loc.gov/2019015369>

6048

Printed in the United States of America
23 22 21 20 19 10 9 8 7 6 5 4 3 2 1

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

SECTION TWO ANATOMIC AND BIOLOGICAL IMPERATIVES **47**

Chapter 3	Anatomy and Physiology of Lactation.....	49
Chapter 4	The Composition and Specificity of Human Milk.....	85
Chapter 5	Drug Therapy and Breastfeeding.....	127
Chapter 6	Viral Infections and Breastfeeding.....	159

SECTION THREE PRENATAL, PERINATAL, AND POSTNATAL PERIODS **175**

Chapter 7	Perinatal and Intrapartum Care.....	177
Chapter 8	Newborn Assessment.....	215
Chapter 9	Postpartum Care.....	247
Chapter 10	Breast-Related Problems.....	281
Chapter 11	Low Intake in the Breastfed Infant: Maternal and Infant Considerations.....	313

Chapter 12	Jaundice and the Breastfed Baby.....	355
Chapter 13	Breast Pumps and Other Technologies	365
Chapter 14	The Use of Human Milk and Breastfeeding in the Neonatal Intensive Care Unit.....	397
Chapter 15	Donor Milk Banking.....	443

SECTION FOUR	BEYOND POSTPARTUM	469
---------------------	--------------------------	------------

Chapter 16	Maternal Nutrition and Breastfeeding	471
Chapter 17	Women's Health and Breastfeeding	481
Chapter 18	Maternal Employment and Breastfeeding	549
Chapter 19	Child Health	577
Chapter 20	The Ill Child: Breastfeeding Implications	619

SECTION FIVE	SOCIOCULTURAL AND RESEARCH ISSUES	675
---------------------	------------------------------------------	------------

Chapter 21	Research, Theory, and Lactation	677
Chapter 22	Breastfeeding Education.....	713
Chapter 23	The Cultural Context of Breastfeeding.....	739
Chapter 24	The Familial and Social Context of Breastfeeding	759

Index		787
--------------	--	------------

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

vi Contents

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
Galactoceles.....	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

viii Contents

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

x Contents

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

Preface



This book is dedicated to Dr. Janice (Jan) Riordan, the founding editor of *Breastfeeding and Human Lactation* and pioneer in the field of human lactation and the lactation consultant profession. Jan passed away on September 17, 2018. I, like many others, miss her very much, but I am eternally grateful to her for her longtime mentoring and the opportunity to serve as an author and editor of *Breastfeeding and Human Lactation*. Jan was an extraordinary scholar who abundantly gave to the lactation and breastfeeding clinical, education, and research community, both nationally and internationally. Professionally, she was a nurse, an international board-certified lactation consultant (IBCLC), a nurse educator, and a breastfeeding researcher with a specialty in instrument development and testing. She was a prolific author, publishing many books and papers in several outstanding peer-reviewed journals, including the *Journal of Obstetric, Gynecologic and Neonatal Nursing (JOGNN)* and the *Journal of Human Lactation*. Jan was a fierce breastfeeding advocate and professional whose efforts were widely demonstrated through La Leche League; Wichita State University, where she taught in the School of Nursing for 23 years and established the Janice M. Riordan Distinguished Professorship in Maternal Child Health; the International Lactation Consultant Association, where she led the research committee and served on the ILCA board of directors; and the International Board of Lactation Consultant Examiners, as a founding member of this important credentialing organization. Her beliefs and values related to breastfeeding and lactation stemmed from her nursing background as well as her personal experiences as a mother of six children. We miss you, Jan, and your love of the lactation and breastfeeding discipline will live on for years to come in *Breastfeeding and Human Lactation*, the classic evidence-based bible of lactation and breastfeeding.

In this *sixth edition*, I welcome Becky Spencer as the new coeditor of *Breastfeeding and Human Lactation*. Becky comes to the coeditor position from Texas Woman's University School of Nursing, where she was recently promoted to associate professor. Becky teaches in the master's and doctoral programs at TWU and conducts breastfeeding research, with a focus on disparities in breastfeeding, especially among African American women. Becky's expertise in qualitative research and excellent writing and editing skills (exhibited in the recently published *Core Curriculum for Interdisciplinary Lactation Care*) will serve her well in her role. Welcome, Becky!

Changes to this *Sixth Edition* are once again plentiful and, it is hoped, useful to our readers. We now have 24 chapters in the book; we have included again a chapter on maternal nutrition in breastfeeding, authored by Alicia Simpson. Extensive changes and revisions were made to some chapters while fewer revisions/changes were made to others. We are fortunate that the evidence underlying the science of breastfeeding and human lactation continues to grow, and we have done our best to include such evidence in the chapters. We welcome several new contributors to the book; many took on chapters authored by Dr. Riordan and retiring authors or joined existing senior authors. Our goal was to include knowledgeable experts, and we believe we have done so.

Since the last edition of the book, advances were again made in the promotion of and support for breastfeeding in the United States. Following in the footsteps of the Best Fed Beginnings program, the EMPower hospital-based quality improvement initiative was implemented between September 2014 and September 2018 to focus on maternity care practices leading to Baby-Friendly designation. Implemented in partnership with the Carolina Global Breastfeeding Institute and Population Health Improvement Partners and with guidance from Baby-Friendly USA, the Centers for Disease Control and Prevention-funded initiative included 91 hospitals in 23 states and led to the designation of 66 new Baby-Friendly hospitals.

As lactation care providers, educators, and researchers, we have an obligation to do our part in

enhancing support for breastfeeding mothers. We hope that our book provides the evidence and information on practical application of that evidence in support of breastfeeding mothers.

Birth practices affect lactation. Thus, this edition again contains considerable content on obstetric issues, especially the importance of skin-to-skin care and keeping mothers and babies together 24 hours a day during the birth hospitalization. Maternity practices and obstetric intervention that impact breastfeeding have retained considerable attention from professional healthcare organizations. This is good news for efforts to support breastfeeding initiation and continuation. Examples include the American College of Obstetrics and Gynecology Committee Opinion #756, *Optimizing Support for Breastfeeding as Part of Obstetric Practice*, and the Association of Women's Health, Obstetric and Neonatal Nurses Practice Brief #4, *Breastfeeding Recommendations for Women Who Receive Medication-Assisted Treatment for Opioid Use Disorders*.

As is true of earlier editions, the sixth edition of this text has a clear clinical focus. Nearly every chapter contains a clinical implications section. Important concepts discussed in chapters are summarized at the end of each chapter—a feature that makes studying easier. Throughout the book are new references deemed by the authors to be the most important from the vastly expanded research and clinical literature. Some older references—which introduced then-new ideas that are now accepted common knowledge—have been removed to make room for the new.

Section 1 contrasts the past and present relative to breastfeeding and the International Board Certified Lactation Consultant (IBCLC)[®]. Chapter 1 concentrates on the work of the present-day IBCLC and the healthcare team who support lactation and breastfeeding, and it addresses work-related issues of lactation consulting, such as staffing. Chapter 2, with its new title, “Breastfeeding and Lactation: Roots and Wings,” presents a historical context of breastfeeding within the greater context of infant feeding practices. Paige Hall Smith and Ellen Chetwynd are new authors of this chapter and have eloquently included an international focus and a sociocultural

context of breastfeeding past and present as well as visions for the future.

Section 2 focuses on basic anatomic and biologic imperatives of lactation. Clinical application of techniques must be based on a clear understanding of the relationships among form, function, and biological constructs. Researchers continue to find and validate the amazing properties in human milk, as described in the newly named Chapter 4, “The Composition and Specificity of Human Milk.”

Section 3 remains the clinical heart of the book and describes the basics of what to do, when to do it, and how to do it when one assists the lactating mother. Section 3 thus centers on the perinatal period in the birth setting and concerns during the postpartum period following the family's return home—notably, breast problems, neonatal jaundice, and infant weight gain. This section also addresses special needs of preterm and ill babies and their mothers, and it presents a critical evaluation of breastfeeding devices and recommends how and when they can be most appropriately used. It concludes with a review of the development and current activities of human milk banking.

The first part of Section 4 focuses on the mother: the mother's health and returning to work. The topics then turn to the infant's health and special health needs. The techniques of infant assessment are explained and demonstrated with photographs.

Section 5 begins with a careful look at research—how it is conducted, why ongoing research is needed, how research findings can be applied in clinical settings, and what theories are related to lactation practice. The principles of education, the cornerstone of clinical practice, are explored next. The book concludes with chapters on culture's effect on breastfeeding and the sociological context of the breastfeeding family functions.

To avoid linguistic confusion, the book uses the following conventions: The masculine pronoun is used to denote the infant or child throughout the text as a matter of convenience to distinguish the child from the breastfeeding mother; nurses, lactation consultants, and other healthcare workers are referred to by feminine pronouns, although we recognize that men serve in all healthcare professions.

Acknowledgments

We are grateful to all current and past researchers and clinicians for providing the foundation for our breastfeeding knowledge and to those institutions that encouraged and supported us in writing the book over the years: the University of Kansas School of Nursing in Kansas City, Kansas; the Wichita State University School of Nursing during the years of Jan Riordan's

editorship; and currently, Texas Woman's University, Denton, Texas.

Finally, we would like to thank our families for their help and encouragement over the years:

The Wambach family: Bill; Jackie, Brian, and Brianne; and Nathan, Sugar, Logan, and Samantha.

The Spencer Family: Phil, Erin, Owen, and Nathan.

Contributors

Teresa E. Baker, MD, FACOG

Professor
Department of Obstetrics and Gynecology
Texas Tech University Health Sciences Center
Amarillo, Texas, USA

Suzanne Bentley, DNP, CNM, APRN, IBCLC

Clinical Nurse Specialist
The University of Kansas Health System
Kansas City, Kansas, USA

Elizabeth C. Brooks, JD, IBCLC, FILCA

Private Practice Lactation Consultant
Wyndmoor, Pennsylvania, USA

Caroline J. Chantry, MD

Professor Emerita
Clinical Pediatrics
University of California Davis HEALTH
Sacramento, California, USA

Ellen Chetwynd, PhD, MPH, BSN, IBCLC

Research Scientist
Center for Women's Health & Wellness
School of Health and Human Sciences, UNC
Greensboro
Greensboro, North Carolina, USA
and
Research Scientist of Clinical Lactation
Department of Food, Bioprocessing and Nutrition
Sciences
North Carolina State University
Raleigh, North Carolina, USA

Eva Chevreux, MS, APRN, IBCLC

Family Nurse Practitioner
Department of Pediatrics
The University of Kansas Health System
Kansas City, Kansas, USA

Jabina Coleman, LSW, MSW, IBCLC

LIFE House Lactation and Perinatal
Services, LLC
Philadelphia, Pennsylvania, USA

Jolynn Dowling, MSN, APRN, NNP-BC, IBCLC

Associate Educator, Janice M. Riordan Distinguished
Professorship in Maternal Child Health
School of Nursing
Wichita State University
Wichita, Kansas, USA

Valerie J. Flaherman, MD, MPH, IBCLC

Associate Professor of Pediatrics
Associate Professor of Epidemiology and Biostatistics
University of California, San Francisco
San Francisco, California, USA

Jimi Francis, BS, MS, PhD, IBCLC, RLC, RDN, LD

Assistant Professor
Health and Kinesiology
University of Texas at Tyler
Tyler, Texas, USA

Catherine Watson Genna, BS, IBCLC

Private Lactation Consultant Practice
New York, New York, USA

Thomas W. Hale, PhD

University Distinguished Professor
Department of Pediatrics
Texas Tech University Health Sciences Center
Amarillo, Texas, USA

Kay Hoover, MEd, IBCLC, FILCA

Lactation Consultant
Riddle Hospital
Media, Pennsylvania, USA

Frances Jones, RN, MSN, IBCLC

Coordinator, Lactation Services and
Provincial Milk Bank
BC Women's Hospital and Health Centre
Vancouver, British Columbia, CA

Laura R. Kair, MD, MAS, FABM

Assistant Professor, Clinical Pediatrics
Medical Director, Well Newborn Care
University of California, Davis
Sacramento, California, USA

Mary Koehn, PhD, APRN, FACCE

Associate Education Professor
 School of Medicine
 University of Kansas, Wichita
 Wichita, Kansas, USA
 and
 Associate Professor Emerita
 School of Nursing
 Wichita State University
 Wichita, Kansas, USA

Rebecca Mannel, MPH, IBCLC, FILCA

Clinical Assistant Professor
 Department of Obstetrics and Gynecology
 University of Oklahoma Health Sciences Center
 Oklahoma City, Oklahoma, USA

Barbara Morrison, PhD, RN, NM, FNP, CKC, IBCLC

Founder & CEO, DrBarbCNM, LLC
 Traverse City, Michigan, USA

Sallie Page-Goertz, MN, APRN, IBCLC, FILCA

Clinical Associate Professor
 Department of Pediatrics
 School of Medicine
 University of Kansas
 Kansas City, Kansas, USA

Wilaiporn Rojjanasirrat, PhD, RNC, IBCLC

Professor, Director of Research and Scholarship
 School of Nursing
 Graceland University
 Independence, Missouri, USA

Hilary Rowe, BSc (Pharm), PharmD, ACPR

Clinical Pharmacy Specialist, Maternal Fetal
 Medicine
 Neonatal and Pediatric Pharmacy
 Surrey Memorial Hospital, Fraser
 Health Authority
 Surrey, British Columbia, CA

Elizabeth P. Schlaudecker, MD, MPH

Assistant Professor
 Pediatrics
 Division of Infectious Diseases, Global
 Health Center
 Cincinnati Children's Hospital Medical Center
 Cincinnati, Ohio, USA

Alicia Simpson, MS, RD, IBCLC, LD

Executive Director, Lead Dietician, and Lactation
 Consultant
 Pea Pod Nutrition and Lactation Support
 Atlanta, Georgia, USA

Paige Hall Smith, MSPH, PhD

Professor, Public Health Education
 Director, Center for Women's Health & Wellness
 School of Health and Human Sciences
 University of North Carolina, Greensboro
 Greensboro, North Carolina, USA

Linda J. Smith, MPH, IBCLC, FACCE, FILCA, FAAN

Owner and Director
 Bright Future Lactation Resource Centre, Ltd.
 Dayton, Ohio, USA

Diane L. Spatz, PhD, RN, FAAN

Professor of Perinatal Nursing and Helen M. Shearer
 Professor of Nutrition
 School of Nursing
 University of Pennsylvania
 and
 Nurse Researcher and Manager of the Lactation
 Program
 Children's Hospital of Philadelphia
 Philadelphia, Pennsylvania, USA

Becky Spencer, PhD, RN, IBCLC

Associate Professor
 College of Nursing
 Texas Woman's University
 Denton, Texas, USA

Marsha Walker, RN, IBCLC

Executive Director
 National Alliance for Breastfeeding Advocacy
 Weston, Massachusetts, USA

Jenny Walters, MPH, IBCLC

Lactation Consultant
 The University of Kansas Health System
 Kansas City, Kansas, USA

Karen Wambach, PhD, RN, IBCLC, FILCA, FAAN

Professor, Director PhD Program, Co-Coordinator
 BSN Honors Program
 School of Nursing
 University of Kansas
 Kansas City, Kansas, USA

Alice Li Ching Wang, BSc (Pharm), ACPR

Clinical Pharmacist
 Surrey Memorial Hospital, Fraser Health
 Surrey, British Columbia, CA

Elaine Webber, DNP, PPCNP-BC, IBCLC

Associate Clinical Professor
 School of Nursing
 University of Detroit Mercy
 Detroit, Michigan, USA

