POCKET NOTEBOOK

POCKET PRIMARY CARE

Second Edition

Meghan M. Kiefer
Curtis R. Chong

A Massachusetts General Hospital Handbook

Wolters Kluwer

POCKET NOTEBOOK

POCKET PRIMARY CARE

Second Edition

Meghan M. Kiefer
Curtis R. Chong

A Massachusetts General Hospital Handbook

Wolters Kluwer

POCKET NOTEBOOK

Pocket PRIMARY CARE

Second Edition

Edited by

MEGHAN M. KIEFER, MD, MPH

CURTIS R. CHONG, MD, PhD, MPhil, FACP

A Massachusetts General Hospital Handbook

Wolters Kluwer

Philadelphia · Baltimore · New York · London
Buenos Aires · Hong Kong · Sydney · Tokyo

Executive Editor: Rebecca Gaertner
Editorial Coordinator: Lindsay Ries
Development Editor: Kristina Oberle
Production Project Manager: Marian Bellus
Manufacturing Coordinator: Beth Welsh
Marketing Manager: Stephanie Manzo
Design Coordinator: Steve Druding
Production Service: Aptara, Inc.

Two Commerce Square
2001 Market Street
Philadelphia, PA 19103 USA
LWW.com

Printed in China

Library of Congress Cataloging-in-Publication Data

Names: Kiefer, Meghan, editor. | Chong, Curtis, editor.
Title: Pocket primary care / edited by Meghan M. Kiefer, Curtis R. Chong.
Other titles: Pocket primary care (Kiefer) | Pocket notebook.
Description: Second edition. | Philadelphia : Wolters Kluwer, [2018] | Series: Pocket notebook | “A Massachusetts General Hospital handbook.” |

Includes bibliographical references and index.
Identifiers: LCCN 2017055856 | ISBN 9781975106126 (loose-leaf)
Subjects: | MESH: Primary Health Care | Handbooks
Classification: LCC RA393 | NLM W 49 | DDC 362.1–dc23
LC record available at https://lccn.loc.gov/2017055856

To purchase additional copies of this book, call our customer service department at (800) 638-3030 or fax orders to (301) 223-2320. International customers should call (301) 223-2300.

Visit Lippincott Williams & Wilkins on the Internet: at LWW.com. Lippincott Williams & Wilkins customer service representatives are available from 8:30 am to 6 pm, EST.

10 9 8 7 6 5 4 3 2 1

CONTENTS

Lower Extremity Edema and Ulcers
Sports and Exercise Clearance
Adult Congenital Heart Disease

DERMATOLOGY

Sarah Gee

Approach to Skin Lesions
Common Benign Growths
Acne
Rosacea
Nonmelanoma Skin Cancer
Melanoma
Bites and Infestations
Tinea
Atopic Dermatitis
Dermatitis
Cutaneous Drug Eruptions
Urticaria
Psoriasis
Alopecia
Wound Care
Topical Corticosteroids
Classical Distribution of Common Skin Disorders

ENDOCRINE

Marc Wein, Lindsay Fourman

Diabetes Mellitus
Osteoporosis
Calcium Disorders
Vitamin D Deficiency
Thyroid Disease
Thyroid Nodules
Adrenal Insufficiency
Adrenal Nodules
Pituitary Disorders
Hyperprolactinemia

GASTROINTESTINAL

Kyle Staller, Long Nguyen

Abdominal Pain
Gastroesophageal Reflux Disease
Peptic Ulcer Disease
H. Pylori
Dysphagia
Constipation
Diarrhea
Irritable Bowel Syndrome
Celiac Disease
Inflammatory Bowel Disease
Abnormal Lfts
Cirrhosis
Gallstones
Pancreatic Disease
Gi Bleeding
Hemorrhoids
Diverticular Disease

HEMATOLOGY & ONCOLOGY

Curtis R. Chong

Anemia
Polycythemia
DVT and Pulmonary Embolus
Anticoagulation
Coagulation Disorders
Platelet Disorders
Abnormal WBCs
Lymphadenopathy & Splenic Disorders
Hemochromatosis
Folate & Vitamin B_{12} Deficiency

INFECTIOUS DISEASE

Jacqueline T. Chu

Influenza

Pneumonia
Sexually Transmitted Infections
Urinary Tract Infection
C. Difficile
Skin & Soft Tissue Infections
Herpes Simplex Virus
Varicella Zoster
Hepatitis B
Hepatitis C
HIV/AIDS
Pneumocystis Prophylaxis
Tuberculosis
Infectious Endocarditis Prophylaxis
Fever of Unknown Origin
Tick-Borne Illness
Travel Medicine

MUSCULOSKELETAL

Sara Schoenfeld, Zachary Wallace

Joint Pain and Monoarticular Arthritis
Polyarticular Arthritis
Rheumatologic Tests
Osteoarthritis
Back Pain
Hip Pain
Knee Pain
Shoulder Pain
Elbow Pain
Hand Disorders
Foot & Ankle Disorders
Fibromyalgia
Gout and Pseudogout
Myalgias
Myositis
Polymyalgia Rheumatica
Systemic Lupus Erythematosus
Glucocorticoids and Disease-Modifying Antirheumatic Drugs

NEUROLOGY

Michael Bowley, Renuka Tipirneni, Sarah Wahlster

Headache
Diplopia
Dizziness and Vertigo
Bell's Palsy
Dementia
Concussion
Weakness
Peripheral Neuropathy
Restless Legs Syndrome
Tremor
Parkinson's Disease
Seizure
Stroke, TIA, & Poststroke Care

HEENT

Rachel Huckfeldt, Aaron Remenschneider

Ophthalmic Evaluation
Vision Loss
Eye Complaints
Eye Injury
Findings in Common Eye Disorders
Allergic Rhinitis
Upper Respiratory Infection
Rhinosinusitis
Pharyngitis
Hoarseness
Dentofacial Pain
Otitis
Hearing Loss

PSYCHIATRY

John B. Taylor

Anxiety Disorders
Attention-Deficit Hyperactivity Disorder

Bipolar Disorder
Depression
Eating Disorders
Insomnia and Sleep Disorders
Obsessive-Compulsive Disorder
Psychotropic Medications
Posttraumatic Stress Disorder
Psychotic Disorders
Somatic Symptoms and Related Disorders
Suicide Risk Assessment

ADDICTION MEDICINE

Sarah Wakeman

Diagnosis and Treatment of Substance Use Disorders
Alcohol Use Disorder
Opioid Use Disorder
Other Drug Use Disorders
Tobacco Use

PULMONARY

Jessica McCannon, Jessica Zeidman

Pulmonary Function Tests
Asthma
Chronic Obstructive Pulmonary Disease
Interstitial Lung Disease
Obstructive Sleep Apnea
Chronic Cough
Hemoptysis
Pulmonary Nodules

RENAL/UROLOGY

Andrew Allegretti

Chronic Kidney Disease
Proteinuria
Hematuria
Nephrolithiasis

WOMEN'S HEALTH

Sara Schwanke Khilji, Alaka Ray

MEN'S HEALTH

J. Scott Gabrielsen, Allen Chang

ABBREVIATIONS

INDEX

Visit us on-line:
pocketprimarycare.com

facebook.com/MGHpocketprimarycare

Questions, comments, feedback? E-mail
editors@pocketprimarycare.com

CONTRIBUTING AUTHORS

Andrew Allegretti, MD, MSc
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Renal/Urology Section Editor)* MGH ’13

Brandon Auerbach, MD, MPH
Attending Physician, Virginia Mason Medical Center *(Obesity)* MGH ’15

Kimberly G. Blumenthal, MD
Attending Physician, Massachusetts General Hospital; Assistant Professor of Medicine, Harvard Medical School *(HEENT Section Editor)* MGH ’12

Michael Bowley, MD, PhD
Assistant in Neurology, Massachusetts General Hospital; Instructor in Neurology, Harvard Medical School *(Neurology Section Editor)* MGH Neurology ’13

Brian Boyle, MD
Psychiatry Resident, Massachusetts General Hospital *(Anxiety and Panic Disorders, Attention-Deficit Hyperactivity Disorder, Depression)*

Allen Chang, MD
Attending Physician, Department of Medicine, UMass Memorial Medical Center; Assistant Professor of Medicine, University of Massachusetts Medical School *(Men’s Health Section Editor)* MGH ’12

Curtis R. Chong, MD, PhD, MPhil, FACP

Attending Physician, Memorial Sloan Kettering Cancer Center *(Hematology and Oncology Section Editor, Elbow Pain)* MGH ’11

Jacqueline T. Chu, MD
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Infectious Disease Section Editor)* MGH ’14

Warren Chuang, MD
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Advance Care Planning, Dementia)*

Daniel Daunis, MD
Psychiatry Resident, Massachusetts General Hospital *(Bipolar Disorder, Difficult Patient, Psychotic Disorders, and Medications)*

Doreen DeFaria Yeh, MD
Attending Physician, Massachusetts General Hospital; Subspecialty Education Coordinator, MGH Division of Cardiology; Instructor in Medicine, Harvard Medical School *(Adult Congenital Heart Disease)* MGH ’06

David Dudzinski, MD, JD
Attending Physician, Massachusetts General Hospital; Director, Cardiac Intensive Care Unit, MGH Division of Cardiology; Instructor in Medicine, Harvard Medical School (*Cardiology Section Editor*) MGH ’09

Lindsay T. Fourman, MD
Endocrinology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Endocrine Section Editor)*

J. Scott Gabrielsen, MD, PhD
Fellow in Men’s Reproductive Surgery and Medicine, Scott Department of Urology, Baylor College of Medicine *(Men’s Health Section Editor, Incontinence)* MGH Urology ’17

Sarah N. Gee, MD
Attending Physician, Vitalogy Skincare *(Dermatology Section Editor)* MGH Dermatology ’12

Benjamin Gigliotti, MD
Endocrinology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Thyroid Disease)*

Stacey Gray, MD
Assistant Professor of Otolaryngology, Massachusetts Eye and Ear Infirmary, Harvard Medical School *(Otitis)*

Priya Gupta, MD, MPH
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School (Cervical Cancer Screening, PID, Vaginitis)

Josephine Henderson-Frost, MD
Medicine Resident, Massachusetts General Hospital *(Psychosocial Interventions)*

Aaron Hoffman, DO, MPH
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School (*Contraception, Menopause, Vaginitis*)

Rachel M. Huckfeldt, MD, PhD
Attending Physician, Massachusetts Eye and Ear Infirmary; Instructor in Ophthalmology, Harvard Medical School *(HEENT Section Editor)* MEEI ’13

Jacob Johnson, MD
Infectious Disease Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(URIs, Influenza, HIV/AIDS)* MGH ’15

April Jorge, MD

Rheumatology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Rheumatologic Tests)*

Sanjat Kanjilal, MD, MPH
Attending Physician, Massachusetts General Hospital; Clinical Microbiology Fellow, Brigham and Women's Hospital; Instructor in Medicine, Harvard Medical School (Pharyngitis, Pneumonia, Skin and Soft Tissue Infection, Urinary Tract Infection)

Sarah Keller, MD
Rheumatology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Approach to Joint Pain, Osteoarthritis)* MGH '16

Meghan M. Kiefer, MD, MPH
Attending Physician, Harborview Medical Center; Assistant Professor of Medicine, Department of Medicine, University of Washington School of Medicine *(General Medicine Section Editor, Wound Care)* MGH '12

Jared Klein, MD, MPH
Attending Physician, Harborview Medical Center; Assistant Professor of Medicine, University of Washington School of Medicine *(Chronic Pain, Chronic Opioid Use)*

Alec Macaulay, MD
Orthopedic Surgery Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Foot and Ankle Disorders)* MGH Orthopedics '16

Elizabeth Madva, MD
Psychiatry Resident, Massachusetts General Hospital *(Eating Disorders, Sleep Disorders, Psychotropic Medications, Somatic Symptoms and Related Disorders)*

Melissa Mattison, MD

Attending Physician and Chief, Hospital Medicine Unit, Massachusetts General Hospital; Associate Professor of Medicine, Harvard Medical School *(Advance Care Planning, Dementia)*

Jessica McCannon, MD
Attending Physician and Director, Critical Care Unit, Mount Auburn Hospital; Instructor in Medicine, Harvard Medical School *(Pulmonary Section Editor)* MGH ’08

Nino Mihatov, MD
Cardiology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Coronary Artery Disease, Chest Pain, Hypertension, Palpitations and Arrhythmias, Atrial Fibrillation, Basics of ECG, Noninvasive Testing, Syncope)* MGH ’16

Alexandra Molnar, MD
Attending Physician, Harborview Medical Center; Associate Professor of Medicine, University of Washington School of Medicine *(Wound Care)*

Ashley Miller, MD
Otolaryngology Fellow, Massachusetts Eye and Ear Infirmary Hospital; Research Fellow in Medicine, Harvard Medical School *(Hearing Loss)*

Mazen Nasrallah, MD
Rheumatology Fellow, Massachusetts General Hospital *(Myositis, Polymyalgia Rheumatica)*

Long Nguyen, MD
Gastroenterology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(GI Section Editor)*

Aria Olumi, MD

Attending Physician, Massachusetts General Hospital; Professor of Surgery—Urology, Harvard Medical School *(Scrotal and Testicular Lesions)*

Amar Oza, MD
Rheumatology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Knee Pain, Gout, and Pseudogout)*

Kerri Palamara, MD
Attending Physician, General Internal Medicine Unit, Massachusetts General Hospital; Director, Primary Care Program, Internal Medicine Residency, Massachusetts General Hospital; Assistant Professor of Medicine, Harvard Medical School *(General Medicine Section Editor)* MGH ’09

Nilay K. Patel, MD
Cardiology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Dyslipidemia, Heart Failure, Valvular Heart Disease, Vascular Disease: Aorta, Vascular Disease: Carotid, Vascular Disease: Peripheral Artery Disease, Lower Extremity Edema and Ulcers, Sports and Exercise Clearance)* MGH ’15

Anne Piantadosi, MD, PhD
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(HSV, Ticke-Borne Illness)* MGH ’14

Judith Puckett, MD
Psychiatry Resident, Massachusetts General Hospital *(Obsessive-Compulsive Disorder, PTSD, Suicide Risk Assessment)*

Alaka Ray, MD
Attending Physician, General Internal Medicine Unit, Massachusetts General Hospital; Associate Program Director for Ambulatory Training, MGH Internal Medicine Residency; Instructor in

Medicine, Harvard Medical School *(Women's Health Section Editor, Menstrual Disorders, Pelvic Pain)* MGH '10

Aaron K. Remenschneider, MD, MPH
Attending Physician, Massachusetts General Hospital/Massachusetts Eye and Ear Infirmary; Lecturer in Otolaryngology, Harvard Medical School *(HEENT Section Editor, Hearing Loss)* MEEI '14

Lacey B. Robinson MD
Allergy and Immunology Fellow, Massachusetts General Hospital; Research Fellow in Medicine, Harvard Medical School *(Allergic Rhinitis, Sinusitis)*

Jacob Rosenberg, MD, PhD
Medicine Resident, Massachusetts General Hospital *(Alcohol Use Disorder, Tobacco Use Disorder)*

Sara Schoenfeld, MD
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Musculoskeletal Section Editor, Back Pain, Polyarticular Arthritis, Hand Disorders, Myalgia)* MGH '13

Sara U. Schwanke Khilji, MD, MPH
Attending Physician, OHSU Hospital; Assistant Professor of Medicine, Oregon Health Sciences University *(Women's Health Section Editor, Breast Health, Female Infertility)* MGH '12

Kyle D. Staller, MD, MPH
Attending Physician, Massachusetts General Hospital; Director of MGH GI Motility Laboratory; Instructor in Medicine, Harvard Medical School *(GI Section Editor)* MGH '12

Ada Stefanescu Schmidt, MDCM, MSc
Clinical and Research Fellow, Harvard Adult Congenital Heart Disease Program, Massachusetts General Hospital; Research

Fellow in Medicine, Harvard Medical School *(Cardiology Section Editor, Adult Congenital Heart Disease)* MGH ’13

Shahin Tabatabaei, MD
Attending Physician, Massachusetts General Hospital; Assistant Professor of Surgery—Urology, Harvard Medical School *(Lower Urinary Tract Symptoms)*, MGH Urology ’03

Cigdem Tanrikut, MD
Attending Physician, Massachusetts General Hospital; Assistant Professor of Surgery—Urology, Harvard Medical School *(Erectile Dysfunction, Male Infertility)* MGH Urology ’05

Mina Tanaka, MD
Medicine Resident, Massachusetts General Hospital *(Other Drug Use Disorders)*

John B. Taylor, MD, MBA
Attending Physician, Massachusetts General Hospital; Instructor in Psychiatry, Harvard Medical School *(Psychiatry Section Editor)* MGH Psychiatry ‘13

Renuka Tipirneni, MD, MSc
Attending Physician; Assistant Professor of Internal Medicine, Department of Internal Medicine, Division of General Medicine, University of Michigan Medical School *(Neurology Section Editor)* MGH ’12

Miriam Udler, MD, PhD
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Diabetes)*

Tavé van Zyl, MD
Ophthalmology Fellow, Massachusetts Eye and Ear Infirmary Hospital; Research Fellow in Medicine, Harvard Medical School (*Ophthalmic evaluation, Vision Loss, Red & Painful eye, Eye injury, Classical Findings of Common Eye Disorders)*

Sarah Wahlster, MD
Attending Physician, Harborview Medical Center; Acting Assistant Professor of Neurology, University of Washington School of Medicine *(Neurology Section Editor)* MGH Neurology ’13

Sarah E. Wakeman, MD
Attending Physician, Massachusetts General Hospital; Medical Director of Substance Use Disorders, Center for Community Health Improvement, Massachusetts General Hospital; Assistant Professor of Medicine, Harvard Medical School *(Addiction Medicine Section Editor)* MGH ’12

Zachary S. Wallace, MD, MSc
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Musculoskeletal Section Editor, Hip Pain, Shoulder Pain, Fibromyalgia)* MGH ’13

John Weems, MD
Medicine Resident, Massachusetts General Hospital *(Opioid Use Disorder)*

Marc N. Wein, MD, PhD
Attending Physician, Massachusetts General Hospital; Assistant Professor of Medicine, Harvard Medical School *(Endocrine Section Editor)* MGH ’11

Brian Zanoni, MD
Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Tuberculosis, Bacterial Endocarditis)*

Jessica Zeidman, MD
Attending Physician, Massachusetts General Hospital; Associate Program Director for MGH Ambulatory Subspecialty Rotations; Instructor in Medicine, Harvard Medical School *(Pulmonary Section Editor)* MGH ’12

Joshua Ziperstein, MD

Attending Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School *(Preoperative Evaluation)*
MGH ’14

ACKNOWLEDGMENTS

Special thanks to Drs. Jeremy Abramson, D. Clay Ackerly, George Alba, Ashwin Ananthakrishnan, George Anesi, Steven Atlas, Aaron Baggish, Matthew Baker, Jason Barrera, Miriam Barshak, Leah Bauer, Jonathan Bean, Seth Bechis, Rachel Bender Ignacio, Rebecca Berman, Matthew Bevers, Ishir Bhan, Shamik Bhattacharyya, Michael Bierer, Shana, Birnbaum, Marcy Bolster, Bryn Boslett, Marjory Bravard, Brian Brennan, Laura Brenner, Judith Briant, Lynne Brodsky, Andrew Brunner, Dana Carne, Brett Carroll, Rodgrigo Cerda, Laura Certain, Kyle Chambers, Quinn Charbonneau, Justin Chen, Garrett Chinn, Josalyn Cho, Kathy Chuang, Ray Chung, Deborah Collier, Fernando Contreras-Valdes, Rebecca Cook, Kathleen Corey, Frank Cortazar, Francis Creighton, Paul Currier, Marie Demay, Amit Desai, Gillian Diercks, Abbie Donovan, Marlene Durand, Brooke Eastham, Meredith Eicken, Mark Eisenberg, Jeffrey Ellenbogen, Anne Emmerich, Katie Famous, Pouneh Fazeli, Shiri Feingold, Donna Felsenstein, Carina Fernandez-Golarz, Joel Finkelstein, Mark Fisher, Esteban Franco Garcia, Daniel Friedman, Jennifer Gao, Tian Gao, Matthew Gardiner, Yin Ge, Mark Geyer, Fiona Gibbons, Rebecca Gillani, Lauren Gilstrap, Charlotte Gore, Shawn Gregory, Daniel Guss, Maria Han, R. Scott Harris, Ardeshir Hashmi, Janae Heath, Amanda Hernandez, John Holden, William Hucker, Rocio Hurtado, Onyi Iweala, Benjamin Izar, Michael Jaff, Ray Jalian, James Januzzi, Richard Johnson, Brandon Jones, Boris Juelg, Norifumi Kamo, Emma Kaplan-Lewis, Anne Kasmar, Daniel Kelmenson, Emily Kendall, Arthur Kim, Alexa Kimball, Joshua Klein, Minna Kohler, John Korman, William Kormos, Paul Krezanoski, Daniela Kroshinsky, Gina Kruse, Braden Kuo, Pooja Lagisetty, Regina Larocque, Kelly Lauter, Brittany Lee Bychkovsky, Annie Lee, Richard Lee, Diana Lemly, William Lin, Michelle Long, Tiffany Lu, Steven Lubitz, Rebecca Luckett, Aparna

Mani, Michael Mannstadt, Gabriel Mansouraty, Nina Mayer Ritchie, Guy Maytal, Julie Miller, Tracey Milligan, Anthony Miuru, James Mojica, Anne Moulton, Erin Murphy DeBiasi, Amulya Nagarur, Kenta Nakamura, Sandra Nelson, Walter J. O'Donnell, Keri Oxley Brenner, Kim Parks, Zachary Peacock, Sashank Prasad, John Querques, Fadi Ramadan, Dina Reiss, Nancy Rigotti, David Ring, Dwight Robinson, Ellen Roh, Dianne Sacco, Mira Sachdeva, David Sallman, Zaven Sargsyan, Kai Saukkonen, William Schmitt, Elizabeth Scoville, Patricia Scripko, Sachin Shah, Meghan Shea, Stephanie Sherman, Derri Shtasel, Leigh Simmons, Naomi Simon, Arthur Sober, Ryan Smart, Jacob Soumerai, Nikolaos Stathatos, John Stone, Craig Surman, Ted Stern, David Sykes, Matthew Tobey, Van-Khue Ton, Nicholas Tritos, Thomas Weigel, Melvin Welinsky, Corrine Welt, Bradley Wertheim, Deborah Wexler, Craig Williamson, Monera Wong, James Young, Elain Yu, Kimon Zachary, Zachary Zator, Rodrigo Zepeda, and Mary Zhang Bechis for their contributions to the first edition. Without them, this book would not have been possible.

FOREWORD

The last decades have witnessed tremendous advances in scientific knowledge and medical technology. At the same time that these advances have transformed our ability to diagnose and treat disease, this new world has also served to remind us of the critical importance of the doctor–patient relationship. The longitudinal relationship between a patient and their doctor is at the heart of what makes medicine work and of what brought so many of us to the field. In many ways, the field of primary care embodies our commitment to that relationship. Thus, perhaps it should not be surprising that, even as technology grows around us, there is a widespread and growing reaffirmation of the importance of primary care to the field of medicine, to our health care system, and, ultimately, to the health of our nation.

The pace of change is accelerating. Thus, there are clear challenges to maintaining skills and knowledge in primary care in a manner that does not diminish the time available to sustain strong physician–patient relationships during periods of health and illness. Many of the most challenging and important communication opportunities reside in primary care as primary care providers try to change health-related behaviors, support informed decision making, and navigate the end of life. It is clear that new tools are needed to support education and practice in primary care.

The first edition of *Pocket Primary Care* arrived at the right moment to support this work. Representing the effort of a dedicated team of house staff and attending physicians at the Massachusetts General Hospital, it brought together evidence and experience to guide physicians through the many domains of primary care, providing concise and useful information for topics from chronic pain to incontinence. Building upon the tradition of the Pocket Medicine handbook, *Pocket Primary Care* understood that information is most

effective if it is accessed and understood when the question arises. As a result, *Pocket Primary Care* has become a valuable addition to the toolkit for primary care physicians. The second edition now arrives with key updates to help maintain the valuable role the guide can serve in the daily practice of primary care. We are deeply grateful to the outstanding team that assembled the second edition of *Pocket Primary Care* and their ongoing commitment to this important work.

KATRINA ARMSTRONG, MD, MS
Physician-in-Chief, Department of Medicine, Massachusetts General Hospital
Jackson Professor of Clinical Medicine, Harvard Medical School

JOSHUA METLAY, MD, PhD
Peter L. Gross, MD, Chair, Chief, Division of General Internal Medicine, Massachusetts General Hospital
Professor of Medicine, Harvard Medical School

DEDICATION

To Will, Liam, Rowan, Elliott, and BK—MMK
To my daughter Leilani Chong—CRC

PREFACE

More than a century ago, the great physician Sir William Osler wrote, “It is much more important to know what sort of patient has a disease than what sort of disease a patient has.” In an era of ever-evolving medical specialties, primary care can seem like an ancient or even anachronistic model of care. Until you practice it. Being someone’s “primary,” no matter the nature or level of your training, reveals the fundamental nature of this relationship to the practice of medicine. The field is changing: team-based care, the new emphases on population health and the medical home, and the evolving use of the electronic health record. These new demands are being met with innovations to create evolving workdays, but the value of the primary care provider role—for the patient, for the family, for the community, and indeed for the provider—can never be in doubt.

Pocket Primary Care was created out of a desire to support those practicing in the ambulatory setting—to recognize the unique and full spectrum of care provided there, from counseling patients on insomnia to diagnosing STIs, from interpreting PFTs to treating osteoporosis. The second edition includes innumerable updates in clinical practice, guidelines, and research from the past 5 years. It reflects the work of dozens of physicians from the MGH diaspora, and we hope that this edition, when combined with sound clinical judgment, improves the lives of its readers and their patients.

This book would not be possible without the tireless efforts of its contributors, who spent their nights and weekends hammering out the best way to share their wisdom with us. To these experts we extend our deepest appreciation. We also wish to thank Dr. Valerie Stone and Dr. Hasan Bazari, who believed in this project even when it was just a fledgling idea in the minds of their trainees. The encouragement and leadership of Dr. Katrina Armstrong and Dr. Josh Metlay have been instrumental in the book’s success, and Dr.

Marc Sabatine provided critical mentorship to us along the way. To them, and to the larger MGH community, for the value it places on primary care and for its belief in the capabilities and responsibilities of its members, we are forever grateful.

MEGHAN M. KIEFER, MD, MPH and CURTIS R. CHONG, MD, PhD, MPhil, FACP

EVIDENCE-BASED MEDICINE

Definitions (Gordis L., *Epidemiology*. 4th ed.)

		Disease	
		+	–
Test of exposure	+	A	B
	–	C	D

- **Incidence:** (New cases of a disease)/(pop at risk) in a given period of time (e.g., 1 case of flu/10,000 elderly in February 2018)
- **Prevalence:** (Cases of disease)/(pop), can be at single timepoint ("point prevalence") or over a period of time ("period prevalence")
- **Sensitivity (True-positive rate):** *Among pts w/ disease,* probability of the disease will be detected by ⊕ test (↑ sens desirable for screening); **A/(A+C)**
- **Specificity (True-negative rate):** *Among pts w/o disease,* probability of the disease will be excluded by ⊖ test (↑ spec desirable for confirming dx); **D/(B+D)**
- **Positive predictive value:** *Among pts w/ ⊕ test,* probability of a ⊕ result being due to disease; PPV depends on disease prevalence in pop (↑ prevalence → ↑ PPV); **A/(A+B)**
- **Negative predictive value:** *Among pts w/ ⊖ test,* probability of a ⊖ result being due to lack of disease; NPV depends on disease prevalence (↑ prevalence → ↓ NPV); **D/(C+D)**
- **Odds ratio (OR):** (Odds of exposure in disease group)/(odds of exposure in control group) = A/C divided by B/D = **AD/BC;** approximates relative risk

- **Relative risk (RR):** (Disease risk in exposed group)/(disease risk in unexposed group), e.g., 15% risk of CA in exposed vs. 5% risk in unexposed → 3 × ↑ RR in exposed group; RR of 1 suggests no assoc between exposure & outcome
- **Risk difference (reduction in RCTs):** (Disease risk in exposed group) – (disease risk in unexposed group), e.g., 15% risk of CA in exposed vs. 5% risk in unexposed → risk difference of 10% or 0.1
- **Number needed to treat/harm:** No. of pts that must be treated to prevent/cause 1 pt to have the measured outcome; 1/(risk difference), e.g., 5% reduction in MI with drug X, 1/(0.05) → NNT of 20

Types of Studies (Weiss NS. *Clinical Epidemiology*. 3rd ed.)

- **Observational Studies:** often only practical/ethical way to look for association (exposure & outcome are somehow linked)
  - *Case-control:* using groups characterized by *outcome,* goal is to identify differences in *risk factors/exposures;* e.g., using groups of pts w/ & w/o lung cancer & comparing smoking exposure; assoc measured w/ odds ratio
  - *Cohort*: using groups characterized by *exposure/risk factor,* goal is to identify differences in *outcome;* e.g., using groups of patients who do & don't smoke & following them over time to compare lung cancer incidence; assoc measured w/ relative risk (RR)
  - *Cross-sectional:* Assess simultaneously for outcome & exposure at single point in time (e.g., how many people in telephone survey are smokers? How many have lung cancer?); may use RR or OR
- **Randomized control trial:** Enrolled participants randomly assigned to intervention groups (e.g., diet vs. exercise for wt loss) & then followed over time to identify differences in outcome; allows for inferred *causality* (exposure → outcome) rather than just association
  - *Single-blinded:* study participants unaware of group assignment (e.g., placebo pill vs. active study drug)
  - *Double-blinded:* both study participants & investigators unaware of group assignment

- **Meta-analysis:** Analysis that pools data from several studies to ↑ statistical power; can be limited by weaknesses in individual studies or by combining disparate groups (e.g., combining studies for tx for acute LBP & chronic LBP)

Considerations in Study Review

- **Internal Validity:** Can I believe these results? Does study accurately answer its question?
- **Bias/study design:** Depending on nature of bias, can minimize **or** exaggerate true association; intrinsic to study itself
  - *Selection bias:* (Primarily an effect of how study was designed) Other than the *known* way they differ (exposed/unexposed in cohort, disease/healthy in case control), how comparable are the two groups? Are they from the same time period, geographic location, SES, occupational group? Was one group more likely to be "lost to follow-up?" & thus not to have their events counted?
  - *Information bias:* (Primarily an effect of how data were collected) Pts w/ known diseases may be prone to differential recall of exposure(s), providers may have different testing patterns for pts w/ risk factors or elicit different hx based on presence/absence of disease; nature of measurement may differ across groups (minimized by blinding)
- **Confounding:** Minimized by randomization in RCT, but major limitation of observational studies; when the assoc between 2 factors is at least partially explained by another, unmeasured factor; can lead to misattribution (e.g., hormone replacement therapy assoc w/ ↓ CAD risk in cohort study, but only because healthier women more likely to take HRT & less likely to have CAD; all other things being equal, HRT can actually ↑ CAD risk)
- **External Validity:** Do these results apply outside the context of this study? Was study population drawn from community it is meant to represent (e.g., people willing to enroll in weight-loss study may be more willing to start exercise program than random sampling from general population)? Who was excluded from the study? How pragmatic was the intervention (e.g., were participants called weekly to ensure adherence?)

- **Applicability:** How closely do study subjects resemble my pt?
- **Generalizability:** Can the results of this study be replicated elsewhere?

HEALTH LITERACY

Background (*Institute of Med* 2004; *NEJM* 2010;363:2283)

- **Definition:** Set of skills/abilities needed to gain access to, understand, & use health-related info; interaction between individual skills & health system demands
- **Numeracy:** Related concept; the math skills needed for timing, scheduling, dosing medications & understanding math concepts (arithmetic, percentages, probability) to understand & apply provider recommendations
- **Epidemiology:** 33% of US adults read at <5th grade level; 55% have difficulty w/ basic calculations; **36% have basic or below-basic health literacy** (e.g., unable to calculate healthy BMI on chart for a given ht, unable to correctly interpret Rx label re: Timing of medication in relation to food)
- **Risk factors:** ↑ Prevalence among elderly, ↓ education, ↓ income, ethnic/racial minorities, ESL (http://nces.ed.gov/pubs2006/2006483.pdf)
- **Role in health disparities:** Poor health literacy is more strongly assoc w/ poor health than race or education level (↓ med adherence, ↓ f/u, ↓ DM control, ↑ costs, ↑ morbidity, ↑ mortality; may mediate some health care disparities
- **Simpler communication improves outcomes:** Pts w/ ↓ health literacy may benefit most from education targeted at their level of understanding, esp for chronic disease mgmt (*JAMA* 2004;292:1711; *JGIM* 2011;27:190)

Evaluation

- **Screening:** Either of the following questions appropriate (*Fam Med* 2004;36:588):

  "How confident are you filling out medical forms by yourself?"

"How often do you have problems learning about your medical condition because of difficulty understanding written information?"

Many recommend "universal precautions" w/ all pts; okay to ↑complexity/speed/terminology of explanation as indicated by pt responses & questions

Management (ahrq.gov)

Health Literacy Universal Precautions	
• **Slow down** • **Use plain language; avoid confusing terms (e.g., "positive test")** • **Show/draw pictures**	• **Limit info provided to most important** • **Use "teach-back" method (below)** • **Encourage questions (below)**

- **Teach-back:** Have pt explain in own words; not asking, "Do you understand?" but instead, "Show me how you're going to take this…" or "What are you going to tell your partner about this?"
- **Encourage questions:** Pts who don't have questions often have not fully understood; ask "*What* questions or concerns do you have?" rather than "*Do* you have any questions?"
- **Medication review:** Ask pts to bring in their meds to appts & describe how they take them; can help w/ clarifying pt understanding & med adherence
- **Medication adherence:** Provide pill boxes, simplify refills (90-day supply, 3 ref), use medication charts (https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/healthlittoolkit2_tool16.pdf)
- **Discussing risk** (*BMJ* 2003;327:745)

  Frequency is easier to understand than percentages, i.e., "Two in 10 people will have a side-effect" is better understood than "a 20 percent chance of side-effect"

  Framing influences pts, i.e., "If 100 pts are treated with drug A, 94 will experience no side effects" vs. "Six of 100 patients using drug A will experience hair loss"

  Present absolute and relative risk: "5 out of 100 people will die of disease X in 10 y; If all 100 people are screened annually, 2 of

them will be saved from dying of X”

Visual aids (e.g., bar graphs) & comparisons to common risks (e.g., driving) are helpful

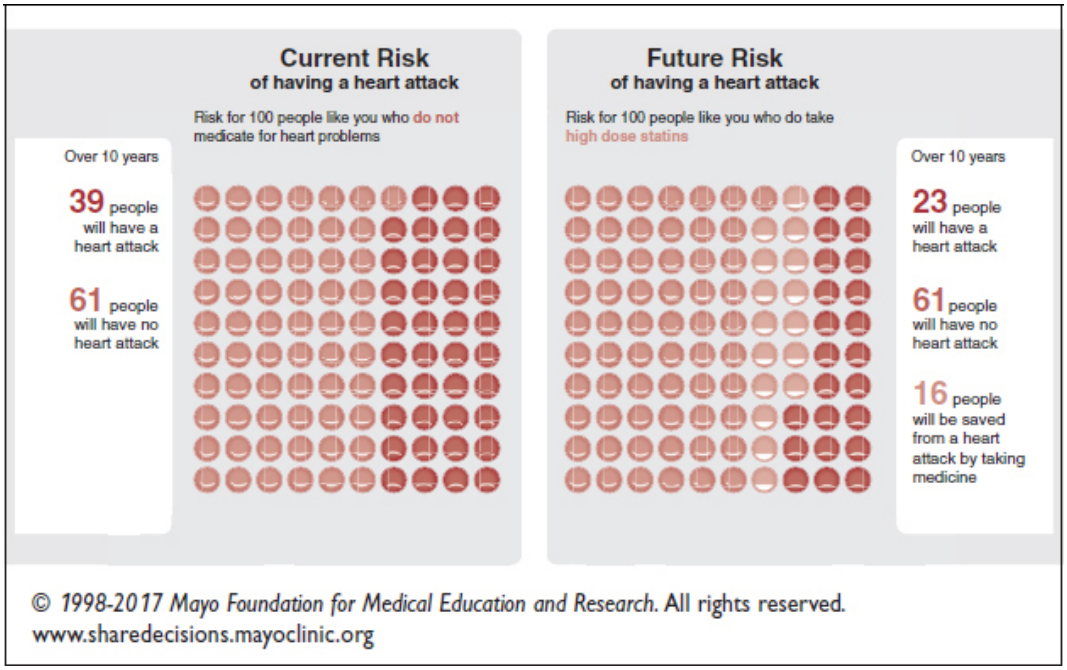
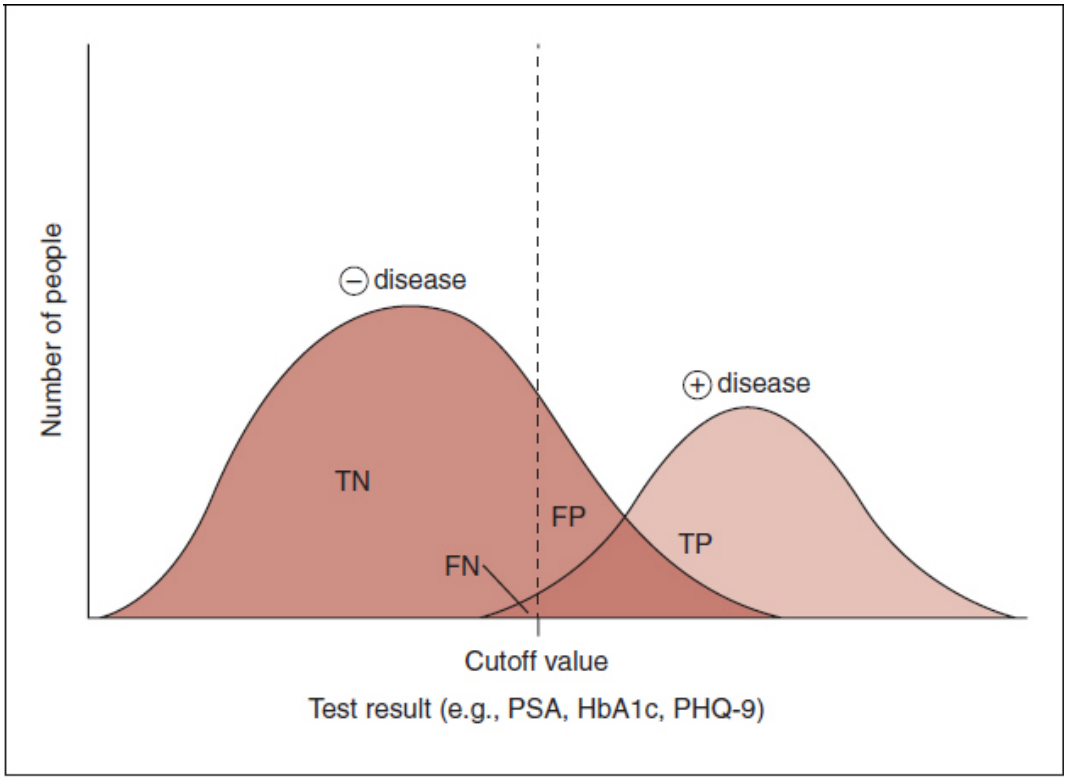


Figure 1-1. Example of Visual Representation of Risk Reduction; Mayo Clinic Statin Decision Aid; for use during clinical encounter)

DISEASE SCREENING

Background

- **Definition:** Screening intended to identify disease in asx individuals when **early detection** is feasible & early tx **improves outcomes**
- Screening test rarely used to to *diagnose* dz; instead used to identify persons at ↑ risk → further testing



Higher cutoff value leads to false ⊕,↑Sp/PPV, ↓Se/NPV; lower cutoff value leads to ↑Se/NPV, ↑Sp/PPV

Figure 1-2. Characteristics of Screening Test

- **Benefits of screening:** Can be difficult to compare direct outcomes btw screened & unscreened groups; often established using:
    1. Proportion of tested population who test positive
    2. Ability of test result to detect disease while still asx
    3. Treatment effectiveness in test-positive people
- **Harms of screening:** False ⊕ can → overdiagnosis & overtreatment, which can have individual & public health costs; screening may identify disease early w/o being able to modify outcome; risks/harms vary based on test & disease

Characteristics of Ideal Screening Test	
Disease	High disease prevalence (↑ PPV of ⊕ test) Tx of early disease is effective: can improve outcomes/avoid complications Disease has known asx/early stage which can be identified
Test	Can detect disease while still asymptomatic Is not overly time-consuming, cumbersome, or financially prohibitive Is sensitive (unlikely to give false ⊖); ideally, is also very specific (unlikely to give false ⊕), but this is more important for confirmatory tests

- **Screening recommendations:** Several government agencies (incl US Preventive Services Task Force, or USPSTF; CDC, NCI) periodically undertake systematic reviews of available data to make recommendations; professional societies (ACOG, AUA, ACP, AAFP) & advocacy organizations (ADA, ACS) also offer independent screening recommendations; may refer to www.guidelines.gov to compare
- **Applying recommendations:** All recommendations are *population-based* & based on principle of long-term/future benefit; they may not apply to certain individuals, particularly those w/ limited life expectancy
- Patients w/ active sx concerning for disease → *testing,* not screening (diagnostics may be different: e.g., hx/PE concerning for cervical CA → referral for colposcopy, not Pap)

Evaluation

- During routine visits, consider which screenings are indicated; guidelines typically by age & gender; can be helpful to organize screening by category (below)
- Potential risks & benefits of screening tests should be discussed w/ pt; goal is shared decision-making (*NEJM* 2012;366:780)

USPSTF Screening Recommendations	
Disease	**Population, preferred test & interval (if given), & notes**
Cancer	
Colon Cancer	**50–75 y:** FOBT (q1y), sigmoidoscopy or FIT-DNA (q1–3y), CT colonoscopy (q5y, requires bowel prep) or colonoscopy (q10y) benefits & burdens greatest w/ colonoscopy (most lives saved, most complications)
Breast Cancer	**40–49 y ♀:** Consider mammography q2y after discussion w/ pt **50–74 y ♀:** Mammography q2y Excludes those at ↑ risk (known genetic mutation, hx chest XRT) ACOG, ACS, ACR recommend more screening (annual mammogram + CBE ± SBE starting at age 40); other groups (AAFP) recommend individual shared decision-making re: screening for ♀ 40–49 y; consider local practice patterns in light of medicolegal risk (*JAMA* 2013;309:2555)
Cervical cancer	**21–29 y ♀:** Pap q3y **30–64 y ♀:** Pap q3y **or** (Pap + HPV q5y), n.b. draft 2018 recommendation See *"Cervical Cancer Screening"*
Prostate cancer	See *"Prostate Cancer";* most groups recommend pt discussion
Lung cancer)	55–79 y w/ 30 pack-y tobacco hx **and** smoked w/in past 15 y: Annual low-dose CT, stop 15 y after quit; quitting >> effective in ↓ lung CA than screening CT
Cardiovascular	
HTN	**All adults:** q1y if last SBP 120–139 or last DBP 80–89; q2y if <120/<80
AAA	**65–75 yo ♂ ever-smokers:** Abd U/S, 1-time screening
Endocrine	
Diabetes	**Adults w/ BP** > 135/80**:** HbA1c, FPG, glucose tolerance test all ok ADA recommends screening all adults >45 & overwt adults <45 w/ 1 add'l risk factor (e.g., ⊕ FHx or PCOS); see *"Diabetes"*
Hyperlipidemia	**All adults at ↑ risk; all ♂ >35:** Total chol, HDL, LDL q5y May ↓ testing interval if borderline; ↑ interval if repeatedly nl
Osteoporosis	**All ♀ >65; ♀ <65 at ↑ risk:** DXA of hip & lumbar spine **For ♀ <65, calculate FRAX score:** If 10 y fx risk >9.3%, considered ↑ risk; see *"Osteoporosis"*
Infectious Disease	

USPSTF Screening Recommendations	
HCV	**Hx IVDU, blood transfusion, all adults born 1945–1965:** Once **Pts at ongoing risk (IVDU):** More frequent testing
HIV	**All adults:** Once ↑ **Risk (MSM, IVDU):** More frequently (see *"HIV"*)
Chlamydia	**Sexually active & (<26 y or ↑ risk):** Screen (see *"Sexually Transmitted Infection"*)
Gonorrhea	Adults at ↑ risk (see *"Sexually Transmitted Infection"*)
Syphilis	Adults at ↑ risk (see *"Sexually Transmitted Infection"*)
Social, Ψ,& Substance Use	
Depression	**All adults:** Brief screening, e.g., PHQ-2, if clinic has care support (SW, mental health counselor to assist in depression care)
EtOH abuse	**All adults:** Brief screening, e.g., AUDIT-C, single question (see *"Alcohol Use Disorders"*)
Tobacco use	**All adults (see *"Tobacco"*):** If screen ⊕, offer counseling
Intimate partner violence	**All ♀ of childbearing age:** Brief screen; see *"Domestic Violence,"* if screen ⊕, provide or refer to intervention services

(USPSTF uspstf.org, *Diabetes Care* 2013;36:S11)

Provider Tools

- USPSTF recommendations available as application for mobile devices at http://epss.ahrq.gov/PDA/index.jsp; enter basic pt info (age, gender) to see list of screening & other recommendations
- National Guidelines Clearinghouse at http://www.guidelines.gov lists recommendations from major government/nongovernment groups, organized by topic

IMMUNIZATIONS

Background (*Healthy People 2020,* cdc.gov, *MMWR Surveill Summ* 2016;65:1)

- Current US guidelines recommend adults be immunized against up to 14 pathogens w/ the goal of ↓ infectious disease incidence & complications
- **Immunization goals:**