

Stahl's Illustrated

Antidepressants

Stephen M. Stahl

University of California at San Diego

Nancy Muntner
Illustrations

Angela Felker Editor





CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,
São Paulo, Delhi

Cambridge University Press 32 Avenue of the Americas, New York, NY 10013-2473, USA

www.cambridge.org
Information on this title: www.cambridge.org/9780521758529

© Neuroscience Education Institute 2009

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2009

Printed in the United States of America

A catalog record for this publication is available from the British Library.

Library of Congress Cataloging in Publication Data

Stahl, S. M.

Antidepressants / Stephen M. Stahl.

p.; cm. - (Stahl's illustrated series)

Approved for a maximum of 3.0 AMA PRA Category 1 credits.

Includes bibliographical references and index.

ISBN 978-0-521-75852-9 (pbk.)

1. Antidepressants. I. Title. II. Series: Stahl's illustrated series.

[DNLM: 1. Antidepressive Agents-pharmacology. 2. Depressive Disorder-drug therapy. QV 77.5 S781a 2009]

RM332.S727 2009 615'.78-dc22

15°./8-dc22 2008054879

ISBN 978-0-521-75852-9 paperback

Every effort has been made in preparing this book to provide accurate and up-to-date information that is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors, and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors, and publishers therefore disclaim all liabilty for direct or consequential damages resulting from the use of material contained in this book. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party Internet Web sites referred to in this publication and does not guarantee that any content on such Web sites is, or will remain, accurate or appropriate. Information regarding prices, travel timetables, and other factual information given in this work are correct at the time of first printing, but Cambridge University Press does not guarantee the accuracy of such information thereafter.



PREFACE

These books are designed to be fun. All concepts are illustrated by full-color images. The text can be used as a supplement to figures, images, and tables. The visual learner will find that this book makes psychopharmacology concepts easy to master, while the non-visual learner may enjoy a shortened text version of complex psychopharmacology concepts. Each chapter builds upon previous chapters, synthesizing information from basic biology and diagnostics to building treatment plans and dealing with complications and comorbidities.

Novices may want to approach this Pocketbook by first looking through all the graphics, gaining a feel for the visual vocabulary on which our psychopharmacology concepts rely. After this once-over glance, we suggest going back through the book to incorporate the images with text from figure legends. Learning from visual concepts and textual supplements should reinforce one another, providing you with solid conceptual understanding at each step along the way.

Readers more familiar with these topics should find that going back and forth between images and text provides an interaction with which to vividly conceptualize complex psychopharmacology. You may find yourself using this book frequently to refresh your psychopharmacological knowledge. You may also find yourself referring your colleagues to this desk reference.

This Pocketbook is intended as a conceptual overview of different topics; we provide you with a visual-based language to incorporate the rules of psychopharmacology at the sacrifice of discussing the exceptions to these rules. A Suggested Readings section at the end of this Pocketbook gives you a good start for more in-depth learning about particular concepts presented here.

When you come across an abbreviation or figure you don't understand, you can refer to the Abbreviation and Symbols legend in the back. After referring to these several times you will begin to develop proficiency in the visual vocabulary of psychopharmacology. Stahl's Essential Psychopharmacology, 3rd Edition, and Stahl's Essential Psychopharmacology: The Prescriber's Guide, 2nd Edition can be helpful supplementary tools for more in-depth information on particular topics in this Pocketbook. Now you can also search topics in psychopharmacology on the Neuroscience Education Institute's website (www.neiglobal.com) for lectures, courses, slides and related articles.

Whether you are a novice or an experienced psychopharmacologist, hopefully this book will lead you to think critically about the complexities involved in psychiatric disorders and their treatments.

Best wishes for your educational journey into the fascinating field of psychopharmacology!

CAMBRIDGE

Cambridge University Press 978-0-521-75852-9 - Antidepressants Stahl's Illustrated Frontmatter More information



Table of Contents

Prefaceiii
CME Informationvii
Objectives xiii
Chapter1: Neurobiology of Depression
Chapter 2: Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin Norepinephrine Reuptake Inhibitors (SNRIs)
Chapter 3: Norepinephrine and Dopamine Reuptake Inhibitors (NDRIs) and Selective Norepinephrine Reuptake Inhibitors (NRIs)
Chapter 4: Alpha 2 Antagonists as Serotonin and Norepinephrine Disinhibitors (SNDIs) and Serotonin Antagonist/Reuptake Inhibitors (SARIs)
Chapter 5: Monoamine Oxidase Inhibitors (MAOIs) and Tricyclic Antidepressants (TCAs)
Chapter 6: Building a Treatment Plan with Novel Treatment and Augmentation Options For Depression
Chapter 7: Depression in Women: Treating Symptoms Throughout the Life Span
Chapter 8: Pharmacokinetics and Algorithms to Treat Depression
Summary
Abbreviations and Symbols
Suggested Readings
Index
CME: Posttest

CAMBRIDGE

Cambridge University Press 978-0-521-75852-9 - Antidepressants Stahl's Illustrated Frontmatter More information



CME Information

CME credit has expired for this activity (2/28/15). You are welcome and encouraged to complete the activity and posttest for your personal enrichment, but will not be able to receive credit nor print a certificate for this activity.

(Original CME Information)

Overview

This book aims to visually explain the concepts behind the neurobiology of depression, as well as the current and novel treatment options available to clinicians to treat depression. The book is divided into eight chapters for ease of reading and referencing. Chapter 1 focuses on the neurobiology behind depression, with an emphasis on the neurotransmitters involved in the experience of depressive symptomatology: serotonin, norepinephrine and dopamine. Chapter 2 begins the introduction of antidepressant drug classes, with an overview and in-depth explanation of each drug in the SSRI and SNRI classes. Chapter 3 covers NDRIs and NRIs; Chapter 4 features SNDIs and SARIs; Chapter 5 examines the older generation of antidepressants— MAOIs and TCAs; and Chapter 6 introduces novel treatment options for managing depression. Chapter 7 focuses on depression in women, emphasizing the role that estrogen plays in the experience of depressive symptomatology. Chapter 8 reviews the pharmacokinetics of antidepressants, and introduces algorithms commonly used to treat depression. The visual component of this book is designed to allow the reader to easily grasp complex concepts.

Target Audience

This activity has been developed for prescribers specializing in psychiatry. There are no prerequisites. All other health care providers interested in psychopharmacology, are welcome for advanced study.

Statement of Need

The following unmet needs and professional practice gaps regarding antidepressants were revealed following a critical analysis of activity feedback, expert faculty assessment, literature review, and through new medical knowledge:

- Not all antidepressants are efficacious in all patients; thus, it is important for mental health professionals to be aware of alternative options.
- Full remission and recovery is still the gold standard for depression, yet only 50% of responders actually achieve remission.
- The most common residual symptoms of treatments for depression are insomnia, hypersomnia and physical fatigue/pain, and executive dysfunction.



To help address clinician performance deficits with respect to treating depression, quality improvement efforts need to provide education that will increase understanding of the neurobiology of psychiatric disease states and the pharmacology of available, new, and in-development medications.

Learning Objectives

After completing this activity, participants should be better able to:

- Recognize the symptoms and circuits of depression and how to treat them in clinical practice
- Understand the pharmacology of antidepressants
- Describe the pharmacodynamics and pharmacokinetics of antidepressants
- Discuss how to select and combine antidepressant treatments
- Highlight new drugs in development for the treatment of depression

Accreditation and Credit Designation Statements

The Neuroscience Education Institute is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The Neuroscience Education Institute designates this enduring material for a maxi \neg mum of 3.0 AMA PRA Category 1 CreditsTM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Nurses: for all of your CNE requirements for recertification, the ANCC will accept AMA PRA Category 1 CreditsTM from organizations accredited by the ACCME.

Physician Assistants: the NCCPA accepts AMA PRA Category 1 CreditsTM from organizations accredited by the AMA (providers accredited by the ACCME).

A certificate of participation for completing this activity will also be available.

Activity Instructions

This CME activity is in the form of a printed monograph and incorporates instructional design to enhance your retention of the information and pharmacological concepts that are being presented. You are advised to go through the figures in this activity from beginning to end, followed by the text, and then complete the posttest and activity evaluation. The estimated time for completion of this activity is 3.0 hours.

NEI Disclosure Policy

It is the policy of the Neuroscience Education Institute to ensure balance, independence, objectivity, and scientific rigor in all its educational activities. Therefore, all individuals in a position to influence or control content development are required by



NEI to disclose any financial relationships or apparent conflicts of interest. Although potential conflicts of interest are identified and resolved prior to the activity being presented, it remains for the participant to determine whether outside interests reflect a possible bias in either the exposition or the conclusions presented.

These materials have been peer-reviewed to ensure the scientific accuracy and medical relevance of information presented and its independence from commercial bias. The Neuroscience Education Institute takes responsibility for the content, quality, and scientific integrity of this CME activity.

Individual Disclosure Statements

Author

Stephen M. Stahl, MD, PhD

Adjunct Professor, Department of Psychiatry, University of California, San Diego School of Medicine

Honorary Visiting Senior Fellow, University of Cambridge, UK

Grant/Research: AstraZeneca, BioMarin, Dainippon Sumitomo, Forest, Genomind, Lilly, Merck, Pamlab, Pfizer, PGxHealth/Trovis, Schering-Plough, Sepracor, Servier, Shire, Torrent

Consultant/Advisor: Abbott, Advent, Alkermes, Arena, AstraZeneca, BioMarin, Boehringer Ingelheim, Bristol-Myers Squibb, Cypress, Dainippon Sumitomo, Forest, Genomind, Janssen, Division of Ortho-McNeil-Janssen, Jazz, Labopharm, Lilly, Lundbeck, Merck, Neuronetics, Novartis, Ono, Orexigen, Otsuka America, Pamlab, Pfizer, PGxHealth/Clinical Data, Rexahn, Royalty, Schering-Plough, Servier, Shire, Valeant, VIVUS

Speakers Bureau: Dainippon Sumitomo, Lilly, Merck, Pamlab, Sepracor, Sunovion

Content Editors Angela Felker, MA

Associate Medical Writer, Neuroscience Education Institute, Carlsbad, CA No financial relationships to disclose.

Meghan Grady

Director, Content Development, Neuroscience Education Institute, Carlsbad, CA No financial relationships to disclose.

Peer Reviewers

(for original release)

Scott A. Irwin, MD, PhD

Director, Psychiatry Programs, The Institute for Palliative Medicine, at San Diego Hospice, San Diego, CA

No financial relationships to disclose.



(for rerelease)

Steven S. Simring, MD, MPH

Clinical Associate Professor, Department of Psychiatry, Columbia University College of Physicians and Surgeons, New York State Psychiatric Institute, New York City No financial relationships to disclose.

Design Staff Nancy Muntner

Director, Medical Illustrations, Neuroscience Education Institute, Carlsbad, CA No financial relationships to disclose.

Disclosed financial relationships with conflicts of interest have been reviewed by the Neuroscience Education Institute CME Advisory Board Chair and resolved. All faculty and planning committee members have attested that their financial relationships do not affect their ability to present well-balanced, evidence-based content for this activity.

Disclosure of Off-Label Use

This educational activity may include discussion of unlabeled and/or investigational uses of agents that are not currently labeled for such use by the FDA. Please consult the product prescribing information for full disclosure of labeled uses.

Disclaimer

Participants have an implied responsibility to use the newly acquired information from this activity to enhance patient outcomes and their own professional development. The information presented in this educational activity is not meant to serve as a guideline for patient management. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this educational activity should not be used by clinicians without evaluation of their patients' conditions and possible contraindications or dangers in use, review of any applicable manufacturer's product information, and comparison with recommendations of other authorities. Primary references and full prescribing information should be consulted.

Sponsorship Information

This activity is sponsored by the Neuroscience Education Institute.

Support

This activity is supported solely by the sponsor, Neuroscience Education Institute. Neither the Neuroscience Education Institute nor Stephen M. Stahl, MD, PhD, has received any funds or grants in support of this educational activity.



Stahl's Illustrated

Objectives

- Recognize the symptoms and circuits of depression and how to treat them in clinical practice
- Understand the pharmacology of antidepressants
- Describe the pharmacodynamics and pharmacokinetics of antidepressants
- Discuss how to select and combine antidepressant treatments
- Highlight new drugs in development for the treatment of depression

xii