

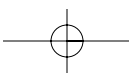
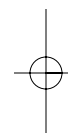
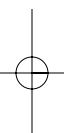
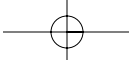
# Health Informatics

---

Kathryn J. Hannah   Marion J. Ball  
Series Editors

**Springer**

*New York*  
*Berlin*  
*Heidelberg*  
*Barcelona*  
*Hong Kong*  
*London*  
*Milan*  
*Paris*  
*Singapore*  
*Tokyo*



Naakesh A. Dewan Nancy M. Lorenzi  
Robert T. Riley Sarbori R. Bhattacharya  
Editors

# Behavioral Healthcare Informatics

With a Foreword by Howard H. Goldman, M.D., Ph.D.



Springer

Naakesh A. Dewan, M.D.  
Executive Director  
Center for Quality  
Innovations & Research  
Department of Psychiatry  
University of Cincinnati  
Cincinnati, OH 45219-8048,  
USA

Nancy M. Lorenzi Ph.D.  
Professor and Assistant  
Vice Chancellor  
for Health Affairs  
Vanderbilt University  
Medical Center  
Nashville, TN 37232-8340,  
USA

Robert T. Riley, Ph.D.  
President  
Riley Associates  
Nashville, TN 37215,  
USA

Sarbori R. Bhattacharya, M.D.  
Resident Physician  
Department of Psychiatry  
University of Cincinnati  
Cincinnati, OH 45219-8048  
USA

*Series Editors:*  
Kathryn J. Hannah,  
Ph.D., R.N.  
Professor, Department of  
Community Health  
Science  
Faculty of Medicine  
The University of Calgary  
Calgary, Alberta, Canada

Marion J. Ball, Ed.D.  
Adjunct Professor  
Johns Hopkins University  
School of Nursing  
*formerly*  
Vice President  
First Consulting Group  
Baltimore, MD 21210  
USA

Cover illustration ©2001 Artville, Inc.  
With 7 illustrations

Library of Congress Cataloging-in-Publication Data

Behavioral healthcare informatics / edited by Naakesh A. Dewan . . . [et al.]

p. ; cm.—(Health informatics)

ISBN 0-387-95265-9 (h/c : alk. paper)

1. Managed mental health care. 2. Medical informatics. I. Dewan, Naakesh A. II.

Series

[DNLM: 1. Behavioral Medicine—organization & administration. 2. Managed Care  
Programs—organization & administration. 3. Medical Informatics. WB 103 B4195 2001]  
RA790.5 .B365 2001  
362.2—dc21

2001020192

Printed on acid-free paper.

©2002 Springer-Verlag New York Inc.

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer-Verlag New York Inc., 175 Fifth Avenue, New York, NY 10010, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use of general descriptive names, trade names, trademarks, etc. in this publication, even if the former are not especially identified, is not to be taken as a sign that such names, as understood by the Trade Marks and Merchandise Marks Act, may accordingly be used freely by anyone.

While the advice and information in this book are believed to be true and accurate at the date of going to press, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Production managed by Terry Kornak; manufacturing supervised by Erica Bresler.

Typeset by Matrix Publishing Services, York, PA.

Printed and bound by Edwards Brothers, Inc., Ann Arbor, MI.

Printed in the United States of America.

9 8 7 6 5 4 3 2 1

ISBN 0-387-95265-9

SPIN 107997803

Springer-Verlag New York Berlin Heidelberg

A member of BertelsmannSpringer Science+Business Media GmbH

This book is dedicated to the people whose support, love, and encouragement have been essential to the success of my efforts. To Nancy Lorenzi, my informatics guru, for her mentorship and unselfishness. To my father, Amrit L. Dewan, a world-class athlete and information systems analyst, who taught me to always strive for the very best in all endeavors. To my mother, Gopi Dewan, a physician, who showed me the joy of healing and caring for others. To my sons, Ashwin and Shyam, for reminding me every day what is really important in life. Finally, to my wife, Devaki, a radiologist with boundless energy, whose love, sacrifice, and daily support and encouragement make life wonderful and all dreams possible.

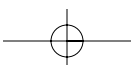
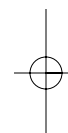
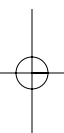
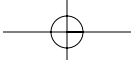
**Naakesh A. Dewan**

We dedicate this book to all the behavioral and informatics pioneers who are helping to create a better future.

**Nancy M. Lorenzi and Robert T. Riley**

“It takes a village to raise a child.” I would like to dedicate my first work to the village chiefs, Drs. Naakesh Dewan and Nancy Lorenzi, for giving me the opportunity to write a dedication in the first place. Then, of course, there are my parents, Amar and Minati Bhattacharya, whose guidance, love, and unending quest for knowledge kept me from being the village idiot. Next is the village doctor, who also happens to be my husband, Sambhu Choudhury. His support, wisdom, and generosity mean the world to me, and I would not be where or who I am today without him. Finally, there are my friends, who made my village the best one on the planet. Lali, Deepak, Arturo, Diana, and Karen, thanks for all your patience and encouragement.

**Sarbori R. Bhattacharya**



## Foreword

*Mental Health: A Report of the Surgeon General* underscores the need for a volume on behavioral informatics without mentioning the field by name even once.

The bulk of the 500 pages of the first-ever report from the surgeon general is devoted to the advances in science in the mental health field. It places mental health within the mainstream of health, as a fundamental component of individual well-being. The report details the evidence for the effectiveness of mental health treatments and services. Further, the report encourages Americans to seek help and to fight the stigma associated with mental illness. The surgeon general identifies the gap between the potential of science and the reality of limited access and actual practice as a serious problem for mental health policy to address. All of these issues turn on the availability of information and a set of techniques and specifications for storing, sharing, and using it. At one level that involves data from research. At another level it means information for service delivery and decision making. The benefits of science and effective treatment cannot be accomplished without a strong information base. Consequently, we need a science of informatics to guide our choices and our decisions. A definitive book like *Behavioral Healthcare Informatics* is an important contribution, because it supports research and practice.

The report of the surgeon general also cautioned about the threats to privacy and confidentiality in the information age. A chapter was devoted to this topic, expressing concern that a loss of confidentiality might threaten the trust needed for individuals with a mental health problem or mental disorder to overcome the stigma and their resistance and to seek treatment.

As a society we must resolve the tension between the promise of information and the threat to privacy posed by its ready availability. We need a technology to make information more accessible and more quickly available to provide better care and treatment to individuals troubled by mental disorders and mental health problems. But individuals must feel comfortable coming forward to receive that care. Confidentiality is essential to the process. Resolving these tensions is a critical step toward better mental health.

This new book, *Behavioral Healthcare Informatics*, written by experts with a

## viii Foreword

concern for technology and humanity, is a dramatic step in the right direction. It will be useful to service users and service providers, researchers and clinicians, as well as program managers and policy makers.

*Howard H. Goldman, M.D., Ph.D.*  
Scientific Editor, *Mental Health: A Report of the Surgeon General*  
Professor of Psychiatry  
University of Maryland School of Medicine  
Baltimore, Maryland



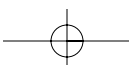
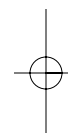
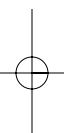
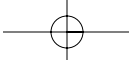
## Series Preface

This series is directed to healthcare professionals who are leading the transformation of health care by using information and knowledge. Launched in 1988 as *Computers in Health Care*, the series offers a broad range of titles: some addressed to specific professions such as nursing, medicine, and health administration; others to special areas of practice such as trauma and radiology. Still other books in the series focus on interdisciplinary issues, such as the computer-based patient record, electronic health records, and networked healthcare systems.

Renamed *Health Informatics* in 1998 to reflect the rapid evolution in the discipline now known as health informatics, the series will continue to add titles that contribute to the evolution of the field. In the series, eminent experts, serving as editors or authors, offer their accounts of innovations in health informatics. Increasingly, these accounts go beyond hardware and software to address the role of information in influencing the transformation of healthcare delivery systems around the world. The series also increasingly focuses on “peopleware” and the organizational, behavioral, and societal changes that accompany the diffusion of information technology in health services environments.

These changes will shape health services in this new millennium. By making full and creative use of the technology to tame data and to transform information, health informatics will foster the development of the knowledge age in health care. As coeditors, we pledge to support our professional colleagues and the series readers as they share advances in the emerging and exciting field of health informatics.

*Kathryn J. Hannah  
Marion J. Ball*



# Preface

In a recent report sponsored by the World Health Organization and the World Bank, behavioral health disorders combined accounted for almost half of the top ten causes of disease burden worldwide. Informatics is just beginning to transform behavioral health and care as it has transformed medical and surgical care. Nowhere else can a little investment in information technology research and development mean so much for so many worldwide. The promise and future of behavioral informatics is outlined in the chapters that follow.

The book is divided into sections that can serve as “modules” for the reader. Sections cover both the science and practice of clinical computing, consumer informatics, quality, technological issues, and organizational imperatives. The authors are physicians, psychologists, informatics executives, researchers, engineers, and sociologists. This diversity of perspectives brings richness to the book and will keep the reader interested and focused.

In the first section, the editors overview the entire landscape of behavioral informatics, which is then followed by a simple, yet comprehensive, chapter on the technologies that will support the convergence of behavioral health care and informatics. The next section covers the entire array of emerging clinical technologies from psychotherapy, to medication management, to care management. The third section focuses on the impact of technology on quality in both the public and private sectors. The final section focuses on the organization and leadership issues involved in transforming a behavioral healthcare organization into an e-behavioral healthcare organization.

In this book, Naakesh A. Dewan, M.D., a leader in behavioral informatics, managed care, and quality improvement, joins with Nancy Lorenzi, Ph.D., Robert Riley, Ph.D., and Sarbori Bhattacharya, M.D., in editing an essential book on behavioral informatics. The editors have crafted a book in collaboration with nationally recognized experts in the field to fill the discipline’s tremendous void.

This book is essential for students and faculty in departments of psychiatry, psychology, social work, other human service disciplines, and informatics departments. It is for clinicians, administrators, information technology (IT) executives, and consumers who wish to know what is possible today and what lies ahead as both technology and behavioral health care converge.

## xii Preface

We hope this book will be considered a “must read” in the field of health informatics. We feel that it is a necessary reference book for any educational, public, or personal library.

*Naakesh A. Dewan*  
*Nancy M. Lorenzi*  
*Robert T. Riley*  
*Sarbori R. Bhattacharya*

# Contents

Foreword	vii
<i>Howard Goldman</i>	
Series Preface	ix
Preface	xi
Contributors	xvii

## PART I OVERVIEW

---

CHAPTER 1	Behavioral Health and Informatics: An Overview	3
<i>Naakesh A. Dewan, Nancy M. Lorenzi, Robert T. Riley, and Sarbori R. Bhattacharya</i>		
CHAPTER 2	Technology Infrastructures	9
<i>David Olson</i>		

## PART II CLINICIANS' ISSUES

---

	Introduction	31
	<i>Ross D. Martin</i>	
CHAPTER 3	Knowledge Delivery and Behavioral Healthcare Professionals	32
	<i>Robert Kennedy</i>	
CHAPTER 4	Decision Support Tools in Psychotherapy and Behavioral Health Care	45
	<i>Lawrence G. Weiss</i>	
CHAPTER 5	Computerized Medication Algorithms in Behavioral Health Care	53
	<i>Madhukar H. Trivedi, Janet K. Kern, Tracy M. Voegtler, Shannon M. Baker, and Kenneth Z. Altshuler</i>	

### **PART III CONSUMERS' ISSUES**

---

- Introduction 67  
*Richard Thompson and Ellen Graves*
- CHAPTER 6 Behavioral Health Consumerism and the Internet 68  
*Norman Alessi and Milton Huang*
- CHAPTER 7 Older Adults, Information Technology, and Behavioral Health Care 77  
*Raymond L. Ownby, Sara J. Czaja, and Chin Chin Lee*

### **PART IV INFORMATICS AND QUALITY IMPROVEMENT**

---

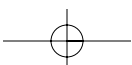
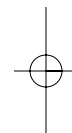
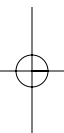
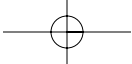
- Introduction 89  
*William S. Edell*
- CHAPTER 8 Managing Clinical Care in a Pervasive Computing Environment. 91  
*Les DelPizzo, Sarbori R. Bhattacharya, Naakesh A. Dewan, and Suresh Bangara*
- CHAPTER 9 Improving Quality and Accountability Through Information Systems 105  
*Charles Ruetsch, David M. Wadell, and Naakesh A. Dewan*
- CHAPTER 10 Decision Support 2000+: A New Information System for Public Mental Health Care 125  
*Marilyn J. Henderson, Sarah L. Minden, and Ronald W. Manderscheid*

### **PART V ORGANIZATIONAL ISSUES**

---

- Introduction 139  
*Nancy M. Lorenzi*
- CHAPTER 11 Barriers and Resistance to Informatics in Behavioral Health Care 140  
*Robert T. Riley, Nancy M. Lorenzi, and Naakesh A. Dewan*
- CHAPTER 12 Leadership Roles and Responsibilities of the Chief Executive Officer and Chief Information Officer 149  
*Nancy M. Lorenzi, Robert T. Riley, and Naakesh A. Dewan*

CHAPTER 13	Organizational Aspects of Implementing Informatics Change 156
	<i>Nancy M. Lorenzi and Robert T. Riley</i>
CHAPTER 14	Evaluating the Impact of Behavioral Healthcare Informatics 171
	<i>Nancy M. Lorenzi, Naakesh A. Dewan, and Robert T. Riley</i>
Index	181





## Contributors

*Norman Alessi, M.D.*

Associate Professor and Chief Information Officer, University of Michigan Department of Psychiatry, Ann Arbor, MI 48109, USA

*Kenneth Z. Altshuler, M.D.*

Professor Emeritus, Department of Psychiatry, University of Texas Southwestern Medical Center, Dallas, TX 75235, USA

*Shannon M. Baker, M.A.*

Research Assistant, University of Texas Southwestern Medical Center, Dallas, TX 75390-9101, USA

*Suresh Bangara, M.D.*

Founder and President, Integrated Health Partners, Woodinville, Washington; Assistant Professor, Clinical Department of Psychiatry and Behavioral Sciences, Koeck School of Medicine, University of Southern California, Los Angeles, CA 90033, USA

*Sarbori R. Bhattacharya, M.D.*

Resident Physician, Department of Psychiatry, University of Cincinnati College of Medicine, Cincinnati, OH 45219-8048, USA

*Sara J. Czaja, Ph.D.*

Professor of Engineering and Psychiatry, University of Miami; Director, Center for Research and Education on Aging and Technology Advancement (CREATE), Miami, FL 33136, USA

*Les DelPizzo*

Director, Strategic Sales, CMHC Systems, Inc., Dublin, OH 43017, USA

*Naakesh A. Dewan, M.D.*

Executive Director, Center for Quality Innovations & Research; Adjunct Assistant Clinical Professor of Psychiatry, University of Cincinnati College of Medicine, Cincinnati, OH 45219-8048, USA

## xviii Contributors

*William S. Edell, Ph.D.*

Senior Vice President, Clinical Development Mental Health Outcomes, Inc.,  
Horizon Health Corporation, Lewisville, TX 75057-6011

*Howard Goldman, M.D., Ph.D.*

Scientific Editor, *Mental Health: A Report of the Surgeon General*; Professor of  
Psychiatry, University of Maryland School of Medicine, Baltimore, MD 21201,  
USA

*Ellen Graves*

Marketing Manager, McKesson Clinical Reference Products, Broomfield, CO  
80021, USA

*Marilyn J. Henderson, Ph.D.*

Assistant Chief, Survey and Analysis Branch, Center for Mental Health Services  
Administration, Rockville, MD 20857, USA

*Milton Huang, M.D.*

Assistant Director, University of Michigan Psychiatric Informatics Program; Lec-  
turer, University of Michigan Department of Psychiatry, Ann Arbor, MI 48109,  
USA

*Robert Kennedy, M.S.*

Editor and Program Director of Medicine, Psychiatry, and Mental Health Divi-  
sion, Medscape, New York, NY 10001-4905, USA

*Janet K. Kern, Ph.D., R.N.*

Fellow, University of Texas Southwestern Medical Center, Dallas, TX 75390-  
9101, USA

*Chin Chin Lee, M.S.*

Research Fellow, Center for Research and Education on Aging and Technology  
Advancement (CREATE), University of Miami, Miami, FL 33136, USA

*Nancy M. Lorenzi, Ph.D.*

Assistant Vice Chancellor for Health Affairs and, Professor of Biomedical In-  
formatics, Vanderbilt University Medical Center, Nashville, TN 37232, USA

*Ronald W. Manderscheid, M.D.*

Chief, Survey and Analysis Branch, Center for Mental Health Services Admin-  
istration, Rockville, MD 20857, USA

*Ross D. Martin, M.D., MHA*

Senior Manager, Business Technology, Pfizer Pharmaceuticals Group, New  
York, NY 10017, USA

*Sarah L. Minden, M.D.*

Assistant Professor of Psychiatry, Harvard Medical School, Boston, MA; Senior Scientist, Abt Associates, Cambridge, MA 02138-1168, USA

*David Olson M.D., Ph.D.*

Assistant Professor in Psychiatry, University of Massachusetts School of Medicine, Worcester, MA 01655, USA

*Raymond L. Ownby, M.D., Ph.D.*

Director, Geriatric Psychiatry Research, and Director, Cognitive Neuroscience Group, Department of Psychiatry and Behavioral Sciences, University of Miami, Miami, FL 33140-2800, USA

*Robert T. Riley, Ph.D.*

President, Riley Associates, Nashville, TN 37215, USA

*Charles Ruetsch, Ph.D.*

Senior Scientist, IMR, an AdvancePCS Company, Hunt Valley, MD 21031, USA

*Richard Thompson*

Vice President, McKesson Clinical Reference Products, Broomfield, CO 80021, USA

*Madhukar H. Trivedi, M.D.*

Director, Depression and Anxiety Disorders Program; Associate Professor, University of Texas Southwestern Medical Center, Dallas, TX 75390-9101, USA

*Tracy M. Voegtler, M.A.*

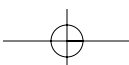
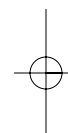
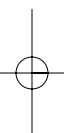
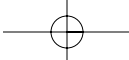
Research Assistant, University of Texas Southwestern Medical Center, Dallas, TX 75390-9101, USA

*David M. Wadell, M.S.*

Vice President Quality Improvement, Workplace Group, Magellan Behavioral Health, Columbia, MD 21046, USA

*Lawrence G. Weiss, Ph.D., M.S.*

Director of Behavioral Healthcare and Personality Group, Psychological Corporation, San Antonio, TX 78204-2498, USA



Behavioral Healthcare Informatics

Dewan, N.A.; Lorenzi, N.M.; Riley, R.T.; Bhattacharya,  
S.R. (Eds.)

2002, XIX, 187 p., Hardcover

ISBN: 978-0-387-95265-9