

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

---

## TECHNOLOGICAL MEDICINE

### The Changing World of Doctors and Patients

Advances in medicine have brought us the stethoscope, artificial kidneys, and computerized health records. They have also changed the doctor-patient relationship.

This book explores how the technologies of medicine are created and how we respond to the problems and successes of their use. Stanley Joel Reiser, MD, walks us through the ways medical innovations exert their influence by discussing a number of selected technologies including the X-ray, ultrasound, and respirator. Reiser creates a new understanding of thinking about how health care is practiced in the United States and thereby suggests new approaches to effectively meet the challenges of living with technological medicine.

As health care reform continues to be an intensely debated topic in America, *Technological Medicine* shows us the pros and cons of applying technological solutions to health and illness.

Stanley Joel Reiser, Clinical Professor of Health Care Sciences and of Health Policy at The George Washington University School of Medicine and Health Sciences, is known nationally and internationally for his scholarship and teaching in ethics, history, technology assessment, and health policy. Before arriving at The George Washington University, he held teaching positions at Harvard University and the University of Texas Health Science Center at Houston. He has written more than 120 books and essays. His articles have appeared in such publications as *Journal of the American Medical Association*, *New England Journal of Medicine*, *Annals of Internal Medicine*, *American Journal of Public Health*, *Health Affairs*, *Hastings Center Report*, *Scientific American*, and *The New York Times*.

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

# TECHNOLOGICAL MEDICINE

The Changing World of Doctors and Patients

---

STANLEY JOEL REISER

*The George Washington University School of Medicine and Health Sciences*



CAMBRIDGE  
UNIVERSITY PRESS

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,  
São Paulo, Delhi, Dubai, Tokyo

Cambridge University Press

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

[www.cambridge.org](http://www.cambridge.org)

Information on this title: [www.cambridge.org/9780521835695](http://www.cambridge.org/9780521835695)

© Stanley Joel Reiser 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*

Reiser, Stanley Joel.

Technological medicine : the changing world of doctors and patients /  
Stanley Joel Reiser.

p. ; cm.

Includes bibliographical references and index.

ISBN 978-0-521-83569-5 (hardback)

1. Medical innovations. 2. Medical technology. I. Title.

[DNLM: 1. Biomedical Technology – trends. 2. Biomedical Technology – history.  
3. History, Modern 1601–. W 82 R377e 2009]

RA418.5.M4.R45 2009

610.28'4 – dc22 2009010914

ISBN 978-0-521-83569-5 Hardback

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.

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

---

*Remembering: Sylvia and Harry Reiser  
and I. Bernard Cohen*

*Celebrating: Katharyn, Traci, Adam, Vanessa,  
Thomas, Caroline, and Tessa*

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

## CONTENTS

<i>List of Illustrations</i>	<i>page</i> ix
<i>List of Tables</i>	xi
<i>Preface</i>	xiii
1. Revealing the Body's Whispers: How the Stethoscope Transformed Medicine	I
2. Enigmatic Pictures: How Patients and Doctors Encountered the X-Ray	14
3. Lifesaving but Unaffordable: The Improbable Journey of the Artificial Kidney	31
4. Promising Rescue, Preventing Release: The Double Edge of the Artificial Respirator	52
5. The Quest to Unify Health Care through the Patient Record	74
6. Putting Technologies on Trial: From Bloodletting to Antibiotics to the Oregon Initiative	105
7. Amid the Technological Triumphs of Disease Prevention: Where Is Health?	129
8. The Technological Transformation of Birth	158
9. Governing the Empire of Machines	186
<i>Notes</i>	205
<i>Index</i>	223

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

## LIST OF ILLUSTRATIONS

1. Laennec, inventor of the stethoscope (1824).	<i>page</i> 6
2. The first X-ray of a human being (1895).	15
3. Muscles of the body, from the text of Vesalius (1543).	16
4. Hooke's depiction of cellular structure (1665).	17
5. Röntgen's X-ray through metal (1895).	22
6. Dialysis using a Kolff-Brigham artificial kidney (1951–1952).	38
7. Philip Drinker and a chalk drawing of a respirator (ca. 1930).	54
8. Construction and demonstration of an early iron lung (1927).	56
9. A child in a respirator (ca. early 1930s).	57
10. A room-sized respirator at the Children's Hospital in Boston (ca. early 1930s).	58
11. Codman's life history reduced to a chart (1934).	81
12. The Back Bay Golden Goose–Ostrich Cartoon (1934).	83
13. The therapy of bloodletting (1804).	107
14. A patient being mesmerized (1794).	114
15. Technology as a spur to disease prevention (ca. 1940).	147
16. "The race with death," mortality rates of tuberculosis, syphilis, and cancer (1926).	148
17. A birth stool and fetal positions in the womb (1545).	161
18. Delivering babies wholly by touch (1711).	165
19. The Chamberlen obstetric forceps (1813).	167
20. A hybrid portrait of male and female birthing practitioners (1795).	170

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

---

LIST OF ILLUSTRATIONS

21. Maternal mortality trends, 1880–1960.	181
22. The automatic contact ultrasound scanner (1959).	196
23. A five-month-old fetus depicted through ultrasound (2008).	198
24. The ultrasound postage stamp (1994).	198

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

---

## LIST OF TABLES

1. Health-care values elicited at community meetings in Oregon  
(1992). *page* 125
2. Categories used to prioritize health-care services in Oregon  
(1992). 126



Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

## PREFACE

This book explores how the technologies of medicine are created; how society, patients, and practitioners respond to the problems and successes of their use; and how this response changes them. For as we create technology and strive to apply its powers, it re-creates us. To demonstrate the different ways through which medical innovations exert their influence, a number of selected technologies are examined. We explore how the first widely used technology to diagnose illness, the stethoscope, transformed the relationship between patients and doctors as it revealed hidden sounds produced in us by disease. We probe the elation and benefits experienced by doctors and the public when the X-ray gave them the power to see into the body and the unanticipated problems its use created. We examine the creation of the artificial kidney and the public efforts first to ration its use and then to fund it. The development of the artificial respirator and a journey that led it to sustain polio victims and later irreversibly comatose patients is explored, with its generation of medical, legal, and ethical quandaries. The events leading to the electronic health record, hailed in contemporary times by doctors, policy makers, and the public as a key to a less costly and more effective health system are probed and the promises of this belief examined. This is followed by considering the rise of scientific means to determine whether therapies are effective or not, such as the randomized clinical trial; and the innovative social and medical decision process Oregon instituted to decide what therapies to offer through publicly funded programs. Technologies to prevent disease and the ambiguous place of securing health as a goal of medical practice are probed, after which the transformation of birth from a social to a technologically driven medical event is discussed, followed by an explanation of the nature of technology and how

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

## PREFACE

it exerts its compelling influence. The understandings gained from this exploration are then applied to suggest fundamental ways to change thinking and practice in health care, and thereby to meet more effectively the challenges of using and living with technological medicine. The book is written for a public, health professional, and health policy readership.

In developing the content for and in writing this book, I have had the constant support and insightful criticism of its editor at Cambridge University Press, Richard L. Ziemacki, to whom I am deeply grateful. In guiding the book through later stages of editing and production, Cambridge editor Eric Crahan made creative and valued contributions, and Shana Meyer, project manager at Aptara Inc., provided always perceptive suggestions.

Securing the literature and illustrations for the work was furthered greatly by the gracious assistance and informative suggestions of the staff of the Himmelfarb Health Sciences Library at The George Washington University Medical Center, among whom I am particularly indebted to Cynthia Kahn, whose bibliographical and historical expertise and timely help greatly furthered my research. The history librarian at the American College of Obstetricians and Gynecologists, Deborah Scarborough, gave me invaluable access to its extensive historical works. I received similarly gracious help from the staff of the National Museum of Health and Medicine of the Armed Forces Institute of Pathology: James Curley and Alan Hawk from its Historical Collections division, and Michael Rhode at the museum's Otis Historical Archives. The holdings of the National Library of Medicine were opened to me by its knowledgeable and always-helpful staff: Stephen Greenberg provided astute analysis of bibliographical issues, and Crystal Smith important assistance in securing documents and literature; Paul Thierman and Sara Eilers gave me expert guidance in finding excellent illustrations. These and other visual material for the book were electronically retrieved and formatted by Robert K. Foreman at the Computer Application and Support Services of The George Washington University Medical Center, for whose insightful work with this material I am most appreciative.

A number of individuals read and criticized different chapters in the book and offered helpful suggestions on aspects of my work. For this, I

Cambridge University Press

978-0-521-83569-5 - Technological Medicine: The Changing World of Doctors and Patients

Stanley Joel Reiser

Frontmatter

[More information](#)

## PREFACE

gratefully acknowledge the late Clifford Dancer, the late Ruth Luzzati, Mark Novitch, Adam Harry Reiser, and Vanessa Reiser Shaw.

The book was begun at the University of Texas Health Science Center at Houston, and I am especially indebted to Janice Glover, John Porretto, and R. Palmer Beasley for their important help with this effort. In 2005 I was invited to be the James Clark Welling Visiting Professor at The George Washington University School of Medicine and Health Sciences, and I made periodic visits to lecture at the university during the next two years. In 2007 I moved to Washington, D.C., to join the medical school faculty, and I completed a large portion of the book under the stimulus of its vibrant and humanistic environment. I am grateful to Stephen Joel Trachtenberg, James C. Scott, and W. Scott Schroth both for the initial opportunity to teach there and for their continued encouragement of my work.

Finally, my wife, Katharyn Dancer Reiser, provided support at all levels of the manuscript's development. Her presence pervades the pages of this book, which could not have been written without her devoted concern and effort.

Stanley Joel Reiser  
Washington, D.C.  
January 2009