
Clinical Nutrition for Oncology Patients

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JONES AND BARTLETT PUBLISHERS

Sudbury, Massachusetts

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World Headquarters

Jones and Bartlett Publishers
40 Tall Pine Drive
Sudbury, MA 01776
978-443-5000
info@jbpub.com
www.jbpub.com

Jones and Bartlett Publishers
Canada
6339 Ormindale Way
Mississauga, Ontario L5V 1J2
Canada

Jones and Bartlett Publishers
International
Barb House, Barb Mews
London W6 7PA
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Production Credits

Publisher: Michael Brown
Production Director: Amy Rose
Acquisitions Editor: Katey Birther
Editorial Assistant: Catie Heverling
Senior Production Editor: Tracey Chapman
Associate Production Editor: Kate Stein
Marketing Manager: Jessica Foucher

Manufacturing and Inventory Control
Supervisor: Amy Bacus
Composition: Cape Cod Compositors, Inc.
Art: AccurateArt, Inc.
Cover Design: Scott Moden
Cover Image: © Kyle Smith/Shutterstock, Inc.
Printing and Binding: Malloy, Inc.
Cover Printing: Malloy, Inc.

Library of Congress Cataloging-in-Publication Data

Clinical nutrition for oncology patients / [edited by] Mary Marian and Susan Roberts.

p. ; cm.

Includes bibliographical references.

ISBN-13: 978-0-7637-5512-6 (hardcover)

ISBN-10: 0-7637-5512-5 (hardcover)

1. Cancer—Diet therapy. 2. Cancer—Nutritional aspects. I. Marian, Mary, 1956– II. Roberts, Susan, 1951–

[DNLM: 1. Neoplasms—diet therapy. 2. Nutrition Therapy. QZ 266 C64178 2010]

RC271.D52C65 2010

616.99'40654—dc22

2008046220

6695

Printed in the United States of America

13 12 11 10 09 10 9 8 7 6 5 4 3 2 1

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*This book is dedicated to our families
for their support and love,
to our authors and colleagues
for their valuable time and contributions to this project,
and
to all cancer survivors and their caregivers
that may we continue to support you on your journey.*

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Cancer is the second leading cause of death in the United States for adults. While everyone diagnosed with cancer reacts differently, the diagnosis is often associated with fear, anger, hopelessness, and a range of other emotions. The American Cancer Society states that as many as one third of cancer deaths in the United States could be prevented if Americans consumed a diet rich in plants and maintained a healthy body weight.¹ Scientific evidence has shown consumption of a diet that consists mostly of plant-based foods such as vegetables, fruits, whole grains, and legumes together with restricting intake of saturated and trans fats and added sugars, and maintaining a body mass index (BMI) < 25, is associated with a reduced risk for chronic diseases such as cancer.¹ Evidence strongly suggests that obesity is associated with an increased risk for breast, colorectal, endometrial, esophageal, and kidney cancer; obesity is also linked with cancers of the cervix, gallbladder, ovary, pancreas, and thyroid; multiple myeloma, Hodgkin's lymphoma, and aggressive prostate cancer are also associated with excess body fat.¹ Alcohol consumption is associated with cancers of the mouth, larynx, pharynx, esophagus, and liver. Smoking is the leading cause of lung cancer, laryngeal and oral cavity and pharyngeal cancers; cancers of the mouth, esophagus, kidney, bladder, cervix, pancreas, and acute myelogenous leukemia are also linked with tobacco use.² Inadequate physical activity is strongly associated with the risk for developing many types of cancer. Sun exposure is another lifestyle habit influencing the risk for cancer. The World Health Organization (WHO) expects worldwide cancer rates to continue increasing because of lifestyle choices, including poor dietary intake and the increasing incidence of overweightness, obesity, physical inactivity, and tobacco use.³

The number of cancer survivors in the United States is over 11 million people⁴; therefore, healthcare clinicians are likely to care for someone with cancer or who has had cancer. Many cancer survivors become interested in changing their diets and lifestyle habits after being diagnosed with cancer. During treatment for cancer, many face a number of challenges, including trying to consume adequate food or liquid in order to maintain nutrition and

hydration status. After treatment, some survivors continue to struggle with intake while others strive to improve their diets to promote recovery and prevent cancer recurrence.

Because of the significant relationship between lifestyle and cancer, it is imperative for healthcare providers to serve as knowledgeable resources. This book is written by a variety of clinicians who not only care for cancer survivors and their caregivers but are also experts in the field of nutritional oncology. The goal of this text is to provide all clinicians interacting with cancer survivors with information to help their patients make informed choices and improve long-term outcomes. The chapters provide nutritional management recommendations for care prior to, during, and after treatment. Given the prevalence of widely available misinformation regarding nutrition and cancer, this text also serves as a reliable and accurate resource. Our hope is that the information provided by this text will assist all clinicians caring for cancer survivors to promote not only survivorship but also optimal quality of life.

Mary Marian and Susan Roberts

REFERENCES

1. The American Cancer Society. Nutrition and Cancer. <http://www.cancer.org>. Accessed September 21, 2008.
2. Centers for Disease Control and Prevention 2008. New Report Estimates More than 2 million Cases of Tobacco-related Cancers Diagnosed in the United States During 1999-2004. <http://www.cdc.gov/media/pressrel/2008/r080904a.htm>. Accessed September 21, 2008.
3. World Health Organization. Global cancer rates could increase by 50% to 15 million by 2020. <http://www.who.int/mediacentre/news/releases/2003/>. Accessed September 20, 2008.
4. The National Cancer Institute. Science Serving People: Why Cancer Research is Important. <http://www.cancer.gov/aboutnci/servingpeople/WhyItIsImportant/>. Accessed September 20, 2008.

Recent advantages in the recognition and treatment of many malignancies have allowed the development of effective and curative treatments for numerous patients with cancer. More than ever, patients who were diagnosed with cancer can say they have been cured. The mainstay of treatment involves chemotherapy, radiation, and surgery. Typically, these treatment modalities impair a patient's capacity to maintain adequate nutrition.

Chemotherapy utilized to eliminate cancer cells takes advantage of the growth preferential of malignant cells over normal cells. This implies, however, that normal healthy cells are also going to be affected by these therapies. Abnormalities of the mucosal lining or gastrointestinal tract are a major problem in the delivery of effective chemotherapy and radiotherapy. This results in significant mucositis, esophagitis, gastritis, and enteritis, with the end result of nausea, vomiting, abdominal pain, diarrhea, and often malabsorption.

Maintaining adequate nutrition during treatment for cancer is often a major ordeal. Treating physicians may have difficulty completing or keeping a patient on schedule due to the known side effects of the treatment. Also, it is not uncommon for cancer therapies to severely impair a patient's nutritional status.

In this book, leading experts in the field of cancer and nutrition provide insight into the challenges associated with the evaluation and maintenance of cancer patients' nutritional status. It is certainly a welcome asset to all health professionals who treat patients with cancer.

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