

# HOSPITAL PHYSICIAN®

## ONCOLOGY BOARD REVIEW MANUAL

### PUBLISHING STAFF

**PRESIDENT, PUBLISHER**  
Bruce M. White

**EXECUTIVE EDITOR**  
Debra Dreger

**SENIOR EDITOR**  
Miranda J. Hughes, PhD

**ASSISTANT EDITOR**  
Melissa Frederick

**EDITORIAL ASSISTANT**  
Rita E. Gould

**SPECIAL PROGRAMS DIRECTOR**  
Barbara T. White, MBA

**PRODUCTION DIRECTOR**  
Suzanne S. Banish

**PRODUCTION ASSOCIATES**  
Tish Berchtold Klus  
Christie Grams

**PRODUCTION ASSISTANT**  
Mary Beth Cunney

**ADVERTISING/PROJECT MANAGER**  
Patricia Payne Castle

#### NOTE FROM THE PUBLISHER:

This publication has been developed without involvement of or review by the American Board of Internal Medicine.



The Association for Hospital Medical Education endorses HOSPITAL PHYSICIAN for the purpose of presenting the latest developments in medical education as they affect residency programs and clinical hospital practice.

## Medical Emergencies in Oncology: I

### Series Editor:

**Arthur T. Skarin, MD, FACP, FCCP**  
*Attending Physician, Department of Adult Oncology  
Dana-Farber Cancer Institute and  
Brigham and Women's Hospital  
Associate Professor of Medicine  
Harvard Medical School, Boston, MA*

### Contributing Author:

**Wolfram Goessling, MD, PhD**  
*Clinical Fellow in Hematology/Oncology  
Department of Adult Oncology  
Dana-Farber Cancer Institute and  
Brigham and Women's Hospital  
Harvard Medical School  
Boston, MA*

## Table of Contents

Introduction . . . . .	2
Metabolic Emergencies . . . . .	2
Neutropenic Fever . . . . .	8
Summary . . . . .	10
References . . . . .	10

Cover Illustration by Christie Grams

Copyright 2000, Turner White Communications, Inc., 125 Stafford Avenue, Suite 220, Wayne, PA 19087-3391, www.turner-white.com. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without the prior written permission of Turner White Communications, Inc. The editors are solely responsible for selecting content. Although the editors take great care to ensure accuracy, Turner White Communications, Inc., will not be liable for any errors of omission or inaccuracies in this publication. Opinions expressed are those of the authors and do not necessarily reflect those of Turner White Communications, Inc.

# HOSPITAL PHYSICIAN®

## ONCOLOGY BOARD REVIEW MANUAL

### Medical Emergencies in Oncology: I

#### Series Editor:

**Arthur T. Skarin, MD, FACP, FCCP**

*Attending Physician*

*Department of Adult Oncology  
Dana-Farber Cancer Institute and  
Brigham and Women's Hospital  
Associate Professor of Medicine  
Harvard Medical School  
Boston, MA*

#### Contributing Author:

**Wolfram Goessling, MD, PhD**

*Clinical Fellow in Hematology/Oncology  
Department of Adult Oncology  
Dana-Farber Cancer Institute and  
Brigham and Women's Hospital  
Harvard Medical School  
Boston, MA*

---

#### I. INTRODUCTION

---

Recent years have brought advances in cancer therapies, resulting in increased cure rates and survival often because of more aggressive treatment regimens. However, emergencies occur frequently in oncologic patients because of either disease progression or treatment. The morbidity and mortality of these complications is substantial. Only quick access to an emergency department, identification of the underlying pathophysiology, and rapid administration of appropriate therapy (complication specific, disease specific, or both) will prevent death or loss of quality of life.

This is the first part of a 2-part review on oncologic emergencies. The first part discusses the management of metabolic emergencies and neutropenic fever. The second part discusses the management of space-occupying lesions and also provides sample board review questions and answers for self assessment.

---

#### II. METABOLIC EMERGENCIES

---

##### A. Tumor lysis syndrome

1. Definition. The tumor lysis syndrome is a life-threatening derangement of electrolytes

caused by massive cytolysis of tumor cells that arises spontaneously or during treatment with chemotherapy or radiation therapy of predominantly hematologic malignancies. It is characterized by the acute development of:<sup>1-3</sup>

- a. Hyperkalemia
  - b. Hyperuricemia
  - c. Hyperphosphatemia
  - d. Hypocalcemia, as a secondary occurrence
  - e. Acute renal failure, as a secondary occurrence
2. Etiology
    - a. Massive lysis or necrosis of radiosensitive or chemosensitive tumor cells results in a sudden release of intracellular components, causing hyperkalemia, hyperphosphatemia, and hyperuricemia. Steroids have also been described as causing tumor lysis syndrome in patients with acute leukemias and non-Hodgkin's lymphoma.
    - b. Calcium phosphate precipitation in the tissue occurs because of acute hyperphosphatemia.
    - c. Oxidation of hypoxanthine and xanthine by xanthine oxidase leads to accumulation of uric acid.