

# HOSPITAL PHYSICIAN®

## CARDIOLOGY BOARD REVIEW MANUAL

### PUBLISHING STAFF

#### PRESIDENT, GROUP PUBLISHER

Bruce M. White

#### EDITORIAL DIRECTOR

Debra Dreger

#### SENIOR EDITOR

Miranda J. Hughes, PhD

#### ASSISTANT EDITOR

Rita E. Gould

#### EDITORIAL ASSISTANT

Kara V. Warner

#### EXECUTIVE VICE PRESIDENT

Barbara T. White, MBA

#### EXECUTIVE DIRECTOR

##### OF OPERATIONS

Jean M. Gaul

#### PRODUCTION DIRECTOR

Suzanne S. Banish

#### PRODUCTION ASSOCIATES

Tish Berchtold Klus

Mary Beth Cunney

#### PRODUCTION ASSISTANT

Stacey Caizzo

#### ADVERTISING/PROJECT MANAGER

Patricia Payne Castle

#### MARKETING MANAGER

Deborah D. Chavis

#### 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.

## Update on Fibrinolytic Therapy: New Treatment Regimens

### Series Editor: A. Maziar Zafari, MD, PhD, FACC

*Assistant Professor of Medicine, Division of Cardiology, Department of Medicine, Emory University School of Medicine, Atlanta, GA, Staff Cardiologist, Atlanta Veterans Affairs Medical Center, Decatur, GA*

### Contributors:

#### Philip R. Huber, MD

*Cardiology Fellow, Division of Cardiology, Department of Medicine, Emory University School of Medicine, Atlanta, GA, Atlanta Veterans Affairs Medical Center, Decatur, GA*

#### Mark E. Leimbach, MD

*Assistant Professor of Medicine, Division of Cardiology, Department of Medicine, Emory University School of Medicine, Atlanta, GA, Atlanta Veterans Affairs Medical Center, Decatur, GA*

## Table of Contents

Introduction . . . . .	2
Case Patient 1 . . . . .	2
Next-Generation Fibrinolytic Agents . . . . .	3
Adjunctive Therapy . . . . .	6
Summary Points . . . . .	10
References . . . . .	11

### Cover Illustration by Christie Grams

Copyright 2002, Turner White Communications, Inc., 125 Strafford 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.

# Update on Fibrinolytic Therapy: New Treatment Regimens

Philip R. Huber, MD, and Mark E. Leimbach, MD

## I. INTRODUCTION

Fibrinolytic therapy emerged from the large “mega-trials” in the 1980s and 1990s as the mainstay of treatment in acute myocardial infarction (MI). It has clearly resulted in a significant reduction in mortality when compared with previous standard therapy (eg, prolonged bedrest, nitrates, and occasional heparin).<sup>1</sup> Despite the success of traditional fibrinolytic agents (ie, tissue plasminogen activator [t-PA] and streptokinase), these agents still have their shortcomings. Unsuccessful reperfusion still occurs in 20% of patients, and restoration of normal coronary artery blood flow is only achieved in about 50% of patients.<sup>2</sup> After successful fibrinolysis, a small subset of patients will experience reocclusion of the infarct-related artery within hours to days.<sup>3</sup> Bleeding complications with fibrinolytic therapy, including intracranial hemorrhage, remain an additional concern. Also, infusion regimens of some of the traditional fibrinolytics are complex.

To address some of these shortcomings, numerous attempts have been made to improve on current therapy. Newer fibrinolytic agents have been developed to ease administration, potentially improve reperfusion rates, and possibly decrease the rate of bleeding complications. The utilization of various agents in combination with fibrinolytic therapy has also been studied in an effort to achieve more complete thrombolysis.

This is the second part of a 2-part review on fibrinolytic therapy. The first part emphasized the early “mega-trials” that laid the groundwork for fibrinolytic use in acute MI (see “Update on Fibrinolytic Therapy: Mega-Trials” in the *Hospital Physician Cardiology Board Review Manual*, Volume 8, Part 2). This second part discusses the use of newer generation fibrinolytic agents and examines more recent adjunctive therapies to fibrinolytic therapy, including platelet glycoprotein IIb/IIIa inhibitors, low-molecular-weight (LMW) heparins, direct thrombin inhibitors, and thienopyridines. A case patient will be provided to highlight features of adjunctive therapy to fibrinolytic therapy in acute MI.

## II. CASE PATIENT I

### PRESENTATION

Patient 1 is a 66-year-old woman who presented to the emergency department 45 minutes after developing severe chest heaviness at work. Except for some mild chest pain that morning (3 hours ago), she has no history of chest pain. Her medical history is significant for type 2 diabetes, diagnosed 6 months ago, and hypercholesterolemia, which is treated with a 3-hydroxy-3-methylglutaryl coenzyme A (HMG CoA) reductase inhibitor. At work, she had taken 2 nitroglycerin tablets (obtained from a colleague) without relief. On physical examination, patient 1 is moderately obese and somewhat anxious. She has a blood pressure of 105/60 mm Hg, a heart rate of 95 bpm, and a respiratory rate of 22 breaths per minute. There is no jugular venous distention. Her chest is clear. The cardiac examination is notable for a II/VI systolic ejection murmur at the upper sternal border. The remainder of the physical examination is within normal limits. An electrocardiogram (ECG) shows normal sinus rhythm with 2 to 3 mm of ST-segment elevation in the inferior leads and 1 to 2 mm of ST-segment depression in leads V<sub>1</sub> through V<sub>3</sub> (Figure 1). She is treated with aspirin, unfractionated heparin, supplemental oxygen, and a  $\beta$ -blocker.

• Which of the following would be the most appropriate therapy for patient 1 at this point?

- A) Administer a glycoprotein IIb/IIIa inhibitor and transfer to the coronary care unit for close monitoring
- B) Administer tenecteplase (TNK-t-PA, 40-mg intravenous [IV] bolus)
- C) Order a ventilation-perfusion lung scan and continue current therapy
- D) Transfer without further medications to a tertiary care facility 2 hours away for cardiac catheterization