

# HOSPITAL PHYSICIAN®

## NEPHROLOGY BOARD REVIEW MANUAL

### PUBLISHING STAFF

#### PRESIDENT, GROUP PUBLISHER

Bruce M. White

#### EDITORIAL DIRECTOR

Debra Dreger

#### SENIOR EDITOR

Bobbie Lewis

#### EDITOR

Robert Litchkofski

#### 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 Caiazzo

#### 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.

## Daily Dialysis

### Series Editor: Stanley Goldfarb, MD, FACP

*Professor of Medicine*

*Interim Chairman*

*Department of Medicine*

*University of Pennsylvania School of Medicine*

*Philadelphia, PA*

### Contributor: Ajay K. Israni, MD

*Research Fellow*

*Renal-Electrolyte and Hypertension Division*

*Center for Clinical Epidemiology and Biostatistics*

*University of Pennsylvania School of Medicine*

*Philadelphia, PA*

## Table of Contents

Introduction . . . . .	2
Case Patient 1: SDHD . . . . .	2
Case Patient 2: NDHD . . . . .	6
The Future of Daily Dialysis . . . . .	10
References . . . . .	10

Cover Illustration by Scott Holladay

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.

# Daily Dialysis

Ajay K. Israni, MD

---

## INTRODUCTION

---

The major limitation of chronic dialysis treatment for patients with end-stage renal disease (ESRD) is a high annual mortality rate. The annual mortality rate among patients requiring dialysis is approximately 20% in the United States, despite well-trained physicians and broad access to therapy due to Medicare and other health insurance coverage (**Figure 1**).<sup>1</sup> This mortality in ESRD patients is at or above the rate seen in patients with malignant diseases such as metastatic colorectal and breast cancer, advanced heart failure, cirrhosis, and AIDS. In sharp contrast, an annual mortality rate of less than 10% has been reported from a French hemodialysis group that provided 8-hour treatments 3 times per week.<sup>2</sup> Another small, retrospective study has reported an annual mortality of less than 10% in ESRD patients undergoing *daily dialysis* 6 times per week in multiple centers in Europe and the United States.<sup>3</sup>

The term *daily dialysis* is a misnomer in that it does not accurately reflect either the frequency or the timing of hemodialysis. For example, the frequency of daily dialysis varies from 5 to 7 times per week. Daytime hemodialysis provided at this frequency for a duration of 2 to 4 hours per session has been referred to as short daily hemodialysis (SDHD). In this manual, SDHD is defined as daytime hemodialysis provided 6 times per week for a duration of 2 hours in a dialysis center. Hemodialysis provided 6 to 7 times per week for a duration of 8 to 10 hours per session while the patient is asleep has been referred to as nocturnal daily hemodialysis (NDHD). In this manual, NDHD is defined as nocturnal hemodialysis provided 6 times per week for 8 hours at home. The term high-intensity dialysis is also appropriate when referring to either SDHD or NDHD.<sup>4</sup> High-intensity does not refer to any specific urea or solute clearance but rather to the increased duration or frequency (greater than 4 times per week) of dialysis. It can be provided either at home or in a dialysis center. Thus, daily dialysis is very different from the conventional intermittent hemodialysis (IHD) being provided 3 times per week for 3 to 4 hours in dialysis centers in the United States.

When chronic dialysis was recognized as a life-saving measure in the United States in the 1970s, nephrologists generally considered IHD provided 3 times per week to be the standard of care. The consensus on frequency of treatment was based primarily on practical considerations of transportation and scheduling of a rapidly growing number of patients requiring chronic dialysis,<sup>5</sup> but it also recognized the importance of a higher frequency of dialysis. Chronic dialysis performed 2 times per week was better than dialysis performed every 5 to 7 days for 20 to 24 hours.<sup>6</sup> Recently, several investigators in the United States, Canada, and Europe have conducted small case series highlighting the advantages of daily dialysis.<sup>5</sup>

Daily dialysis has potential benefits over IHD, but because a randomized clinical trial comparing the 2 modalities has not been done, the possible mortality benefits of daily dialysis are not clear. This manual describes the potential advantages and disadvantages of daily dialysis, discusses patient selection criteria, and highlights aspects of the management of patients receiving this form of dialysis treatment.

---

## CASE PATIENT 1: SDHD

---

### PRESENTATION AND HISTORY

A 57-year-old white man with a history of ESRD due to type 2 diabetes who receives IHD at a frequency of 3 times per week presents with a complaint of persistent nausea and vomiting on his nondialysis days. The patient would like to increase the frequency of his dialysis treatment in order to resolve the nausea and vomiting on his nondialysis days. He was seen by a gastroenterologist, who performed several tests, including an upper endoscopy, all of which were normal. The patient does not have diabetic neuropathy or gastroparesis. He has been treated with IHD for the past 3 months and has been compliant with his 4-hour hemodialysis treatment sessions performed 3 times per week. He uses an F8 polysulfone dialyzer (Fresenius Medical Care, Bad Homburg, Germany) with a dialysate flow rate of 800 mL/min and a blood flow rate of 500 mL/min. He has a fistula that is functioning