

WCHM

WOUND CARE AND HYPERBARIC MEDICINE

VOLUME 8, ISSUE 2 — SUMMER 2017

INSIDE THIS ISSUE

Overutilization of Antibiotics in
the Outpatient Wound Care/
Hyperbaric Program

Practitioner Poll

UHMS Celebrates 50 Years of
Dedicated Service to the
Field of Undersea and
Hyperbaric Medicine

Oxygen and the Brain

Begin Summer Training by
Understanding the History
Components of Evaluation and
Management

Protective Footwear

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CONTENTS

NOTE FROM THE EDITOR..... 3

HYPERBARIC MEDICINE

**Overutilization of Antibiotics in the Outpatient
Wound Care/Hyperbaric Program..... 4**

By Laura Josefsen, RN, ACHRN

Practitioner Poll

Please take the survey 7

**UHMS Celebrates 50 Years of Dedicated
Service to the Field of Undersea and
Hyperbaric Medicine 8**

By Renée Duncan and Dr. Enoch Huang

Oxygen and the Brain..... 11

By Philip B. James, MB, ChB, DIH, PhD, FFOM

BILLING AND CODING

**Begin Summer Training by Understanding
the History Components of Evaluation
and Management 14**

*By Gretchen Dixon, MBA, RN, CCS, CPCP, ICD-10-CM/
PCS Trainer*

WOUND CARE

Protective Footwear

Part 4B in the Diabetic Wound Prevention series 23

By Anna M. Tan, Michael B. Strauss, and Lientra Q. Lu

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The GOOD news: The 2017 Annual Meeting has been approved for **18** credit hours.

The EVEN-BETTER news: You can get an **EXTRA 23** credit hours!

Here's how: NEW this year, you'll have the opportunity to receive an **ADDITIONAL 23** credit hours for the Poster Sessions. It will involve reviewing approximately 100 posters approved by the Scientific Committee for the live meeting and answering a question about each one online as a CME activity. All registered attendees will receive a special coupon code to 'purchase' the Poster Sessions for free on the UHMS Course website.

TO RECAP:

Attend our LIVE UHMS 2017 Annual Scientific Meeting, and earn up to 41 credit hours!

Come to Naples, Florida, and celebrate our 50th Anniversary with us.

It's well worth your time and money... all those credit hours . . . the ambiance of beautiful Naples: **YES!**

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<https://www.uhms.org/asm-new.html>

Save **the Date** ♦ **Join us in June!**

NOTE FROM THE EDITOR

Congratulations to the Undersea and Hyperbaric Medical Society on their 50th anniversary! This year the UHMS 2017 Annual Scientific Meeting, held in sunny Naples, Florida, will create a forum for professional scientific growth and development of participants to improve knowledge and competence to further patient outcomes. The meeting provides a basis for exchange of ideas, both scientific and practical, among physicians, researchers, and other health professionals. This is an event you don't want to miss! Read the article in this issue of *WCHM* for more information.

Also at the Annual Scientific Meeting, Best Publishing Company is releasing these two important publications:

- *Hyperbaric Medicine Practice, 4th Edition*, the long-awaited, completely revised and updated edition of Dr. Harry Whelan and Dr. Eric Kindwall's keystone textbook in hyperbaric medicine
- *Policy and Procedural Guidelines for Hyperbaric Facilities*, edited by Dr. Owen O'Neill, a needed resource and reference for new and established hyperbaric facilities

More information on these publications as well as presale and customized-version opportunities are included in this issue.

Antibiotic overutilization has become a national priority for

patient safety by governmental health-care agencies. Laura Josefsen describes how nursing can make a difference.

The UHMS solicits and reports on feedback from its members and other practitioners from the Supervision of Hyperbaric Oxygen Therapy Survey. Read how you can participate in this effort.

Dr. Philip James discusses oxygen and the brain, while Gretchen Dixon focuses on the troubled topic for the elements of clinical documentation in the Evaluation and Management (E/M) visit levels, which need reviewing.

Prolific contributors Dr. Strauss, Anna Tan, and Lientra Lu continue their Diabetic Wound Prevention series with Part 4b, where they continue to expound on protective footwear as an essential component for the prevention of new and recurrent wounds.

Please consider authoring an article for *WCHM*, where you will reach an audience of thousands of wound care and hyperbaric medicine practitioners. Please submit your articles to info@bestpub.com or call 561.776.6066, ext 4. We also invite you to join our elite group of *WCHM* advertisers to reach your target audience.

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Lorraine Fico-White
Managing Editor, *WCHM*

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Overutilization of Antibiotics in the Outpatient Wound Care/Hyperbaric Program

How nursing can make a difference by using quality-improvement processes

By Laura Josefsen, RN, ACHRN

*“If you cannot measure it, you cannot improve it.”
— Lord Kelvin*

It is known that antibiotics are necessary and save lives. It is also known that the overutilization and/or inappropriate use of antibiotics may result in drug-resistant bacteria that can lead to complications resulting in less-than-optimal outcomes for the patient as well as in increased costs. The issue of antibiotic overutilization has become a national priority for patient safety by governmental health-care agencies.

Antibiotic stewardship programs (ASPs) are quality-improvement processes to gather data to evaluate and determine evidence-based practice guidelines to better define diagnostic criteria for antibiotic use. These data include the following:

- Assessing wound
- Obtaining wound cultures
 - Determine whether wound is colonized or infected.
 - Perform cultures prior to antibiotic use.
 - Ensure wound culture is not contaminated.
- Monitoring the antibiotics being prescribed
 - Recommend pharmacy oversight.
- Utilizing antibiotic time-out after 48 hours
 - Determine correct antibiotic per culture result (may need specific antibiotic).
 - Determine if wound is multiply infected (may need broad spectrum antibiotic).
 - Determine if modifications are needed.
- Administering antibiotic medication by nursing staff
 - Education for patient
- What to expect from medication — drug action and side effects
- Indications
- Correct dosage

- Right route of administration
- Have automatic stop orders in place
- Monitoring patient compliance
- Nursing assessment includes the following:
 - Medication list, medication history, medication reconciliation
 - Allergies and allergy reconciliation
 - Culture results monitored to ensure appropriate antibiotic
 - Change in condition or adverse reaction to antibiotics monitored for patient
- Ongoing assessment of the patient and the wound
 - Wound healing progress
 - Determine when wound is no longer infected

Recommended system for evaluating data:

- A physician leader
- Leadership commitment
- Education
 - Patient education
 - Regular updates on data
 - Transparency of ongoing results with clinical staff
 - Ensuring staff competencies
 - Wound cultures
 - Understanding colonization vs. infection
- Chart reviews — current and retrospective for completeness of information above
- Development of clinical pathways

Patient safety is the primary goal for the process of ASPs. Now is the time to be proactive in developing this process for your unit as data are being gathered around the nation to provide evidence-based practice guidelines for antibiotic use.

Resources

Centers for Disease Control and Prevention. Measuring outpatient antibiotic prescribing. Updated March 22, 2017. Available at: <https://www.cdc.gov/getsmart/community/programs-measurement/measuring-antibiotic-prescribing.html>

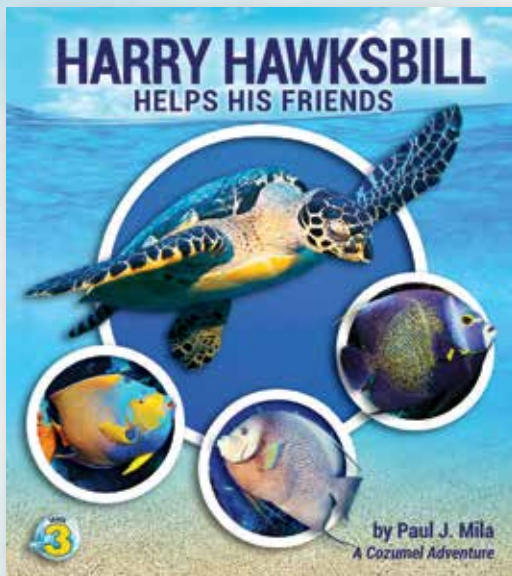
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Sanchez GV, Fleming-Dutra KE, Roberts RM, Hicks LA. Core elements of outpatient antibiotic stewardship. *MMWR Recomm Rep*. 2016;65(No. RR-6):1–12. Updated November 10, 2016. Available at: DOI: <http://dx.doi.org/10.15585/mmwr.rr6506a1> ■

About the Author

LAURA JOSEFSEN, RN, ACHRN, has been involved in hyperbaric nursing since 1982. A founding member of the Baromedical Nurses Association (BNA) in 1985, she served as BNA president from 1996 to 1998 and as a board member in several positions throughout the years. She served on the Undersea and Hyperbaric Medical Society (UHMS) Associates Council for six years, with two of those years as Nurse Representative on the UHMS Board of Directors. She has been a member of the UHMS Accreditation Team as a nurse surveyor, served for many years as an executive board member of the National Board of Diving and Hyperbaric Medical Technology and is a previous chairman of the BNA Certification Board. She is a member of the UHMS Associates, former member of Divers Alert Network, and former member of the Hyperbaric Technologists and Nurses Association (HTNA) of Australia. She has numerous publications and is an internationally recognized speaker in the field of hyperbaric medicine. Her passions are quality improvement and education to promote hyperbaric nursing, safety, and optimal standards of care and practice for patients and the community.



About the Author:

Paul J. Mila devotes his time to writing, scuba diving, underwater photography, and speaking to groups about ocean conservation.



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— **David Flatley**, Superintendent Carle Place Schools

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Practitioner Poll

Please take the survey

The Undersea and Hyperbaric Medical Society (UHMS) solicits and reports on feedback from its members and other practitioners on a critical matter: issues with third-party payers. This includes the Centers for Medicare/Medicaid Services and its contractors, as they continue to dominate the reimbursement landscape.

If you are on the CMS database of providers who billed for “99183: Supervision of Hyperbaric Oxygen Therapy” or a member of UHMS, you should have received the link to the UHMS biannual Supervision of Hyperbaric Oxygen Therapy (99183) survey 2017: <http://www.surveymonkey.com/r/SupervisionOfHyperbaricOxygen17>

Results of the survey, which was developed through the UHMS Quality, Utilization, Authorization and Reimbursement Committee (QUARC), will be made available to the membership as well as all nonmembers who complete it.

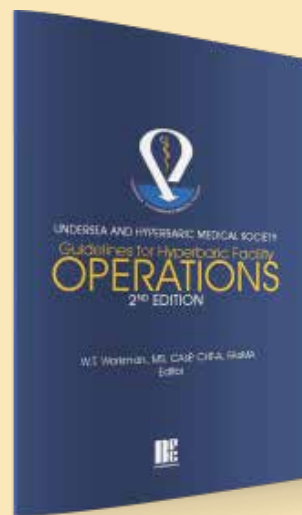
“We encourage all practitioners to complete the survey,” said John Peters, UHMS executive director.

To date, 75% of the providers who have responded to the UHMS 2017 Supervision of Hyperbaric Oxygen Therapy (99183) survey question “Which activity of the UHMS is most important?” ranked “representation to federal, state and local agencies on matters related to efficacy, standards of care, reimbursement, etc.” as most important, Peters said.

This is the second survey performed by the UHMS. The organization compares the results of both surveys, as applicable, and updates and shares them on an ongoing basis.

“The information is important for practitioners to understand their peers, how they practice, how much income they are generating, and the challenges they’re seeing in the marketplace,” Peters said.

For more on this project and to read about other QUARC projects, visit the UHMS regulatory affairs web page at <https://www.uhms.org/resources/regulatory-affairs.html> ■



UHMS Guidelines for Hyperbaric Facility Operations

2ND EDITION

This collection of recommendations from hyperbaric medicine experts is a ready reference for practitioners to ensure competency, quality of care, and safety in the practice of hyperbaric medicine.

The new 2015 edition incorporates information from two major society position statements:

- Clinician Attendance of Hyperbaric Oxygen Therapy (March 2009)
- UHMS Credentialing and Privileging Guidelines for Hyperbaric Medicine Physicians in the USA (June 2014)

This edition also includes input by UHMS associates on matters related to nursing and technical personnel.

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UHMS Celebrates 50 Years of Dedicated Service to the Field of Undersea and Hyperbaric Medicine

By Renée Duncan and Dr. Enoch Huang

This year the UHMS is golden. The Undersea and Hyperbaric Medical Society celebrates its golden anniversary this year in style, with a special Annual Scientific Meeting (ASM) in Naples, Florida, and the introduction of PATH, a new comprehensive training program.



Annual Scientific Meeting

A distinguished body of speakers will discuss the often-unique issues that practitioners of undersea and hyperbaric medicine face, with an eye to both past and future. Plus, a stable of courses, both pre- and postmeeting, promise a wealth of useful learning. Here's a snapshot of what to expect.

Speakers

- John Feldmeier gives the Kindwall keynote lecture, discussing the intertwined history of hyperbaric medicine and chronic radiation tissue injury.
- In the Lambertsen keynote, Tom Neuman will discuss one of the quintessential maladies of undersea medicine: arterial gas embolism.
- In the ASM's first plenary session of the Society's 50th anniversary celebration, Richard Moon and Peter Bennett lead off with a review of the history of the UHMS.
- Lindell Weaver will present the most recent research on mild traumatic brain injury.
- John Feldmeier and Jaleh Mansouri have an update on the clinical practice guidelines for carbon monoxide poisoning, compromised flaps/grafts and chronic radiation tissue injury.
- Gerardo Bosco, Folke Lind and Mahito Kawashima plan to review developments in hyperbaric medicine outside the United States.

- Daniel Popa (UCSD) and Mark Binkley (University of Pennsylvania) will provide the annual UHM Fellow review of new undersea and hyperbaric literature.
- Peter Witucki and Ian Grover discuss what the Emergency and Critical Care Hyperbaric Oxygen Working Group has done to address the lost art of emergency and critical care hyperbaric medicine.
- In addition to reviewing UHMS' first 50 years, Simon Mitchell and Stephen Thom will look ahead at what UHMS might be doing 50 years from now in the field of undersea and hyperbaric medicine.

E-Posters and More Credit Hours

- Earn up to 41 continuing education credits. As an added bonus to the 18 credits available for the general session, ASM attendees are eligible to earn up to 23 additional credits for 93 posters.
- Times are changing, and so is UHMS. E-poster sessions join the lineup of what's new this year. The live interactive format allows presenters to give a more thorough explanation of their work. The online session is a self-study: After viewing the posters, attendees answer a question on each one. Attendees can view any poster at any time.

Precourses and a Postcourse

Three precourses and a postcourse bookend the meeting. Choose to attend one of these pre-ASM sessions:

WEDNESDAY, June 28

- Hyperbaric Oxygen Safety: Clinical and Technical Issues
- Management of DCI in the Field and Development of Best Practice Guidelines
- How to Prepare for Accreditation

Stay an extra day for this offering:

SUNDAY, July 2

- Reimbursement Rollercoaster: Provider and Faculty Update

The UHMS PATH

The UHMS Program for Advanced Training in Hyperbarics (PATH) has launched Block 1. PATH is a comprehensive program for physicians and advanced practice clinicians (APCs). Nine blocks total include 100-plus hours of self-directed learning, case reviews by PATH faculty, case conferences, and an emergency hyperbaric management and procedure skills lab.

“Given the huge gap in education between the 40-hour course ‘floor’ and fellowship training ‘ceiling,’ we needed to create another rung in the ladder to raise the level of knowledge of hyperbaric practitioners,” said UHMS

President and Course Director
Dr. Enoch Huang.



Upon completion of the PATH, physicians will be awarded a certificate of added qualification; APCs will be awarded a certificate of advanced education.

Find out more information online in *Pressure*, the open-access newsletter of the UHMS.


Dr. Huang has posted a Q&A section in the second-quarter edition. (Go to <https://www.uhms.org/publications/pressure.html?task=document.viewdoc&id=2003>).

To learn more about UHMS or to join, visit www.uhms.org. ■






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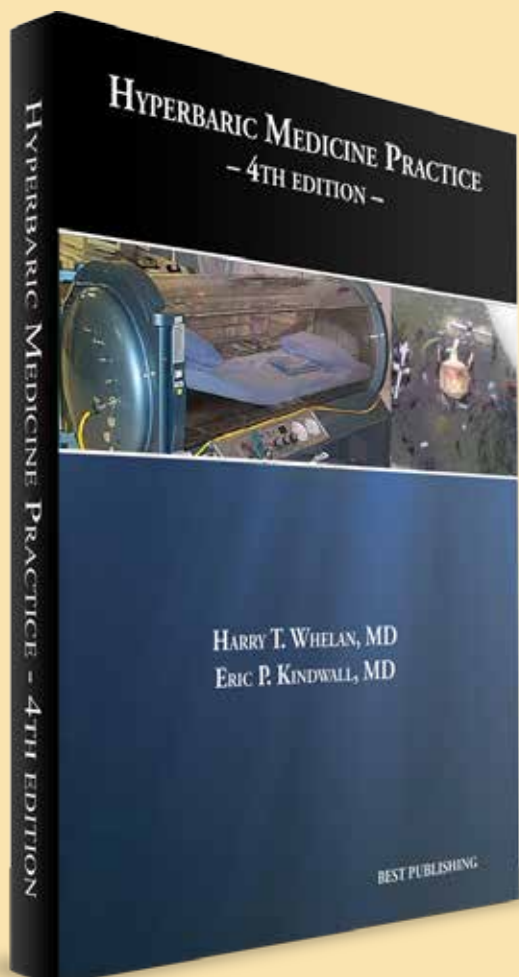
UHMS Accreditation means that your facility has met the highest standards of care and patient safety through our rigorous evaluation of the adequacy of your facility, equipment, staff and training to ensure that the utmost quality is maintained within our specialty. UHMS is committed to providing, promoting, developing and raising quality of care across the spectrum in scientific communication, life sciences and clinical practices of hyperbaric medicine by promoting high standards of patient care and operational safety. If your facility is part of this elite group, congratulations! If not, let us help you get started.

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The long-awaited, **COMPLETELY REVISED AND UPDATED** edition of Dr. Harry Whelan and Dr. Eric Kindwall's keystone textbook in hyperbaric medicine is available for presale.



HYPERBARIC MEDICINE PRACTICE

4TH EDITION

by Dr. Harry Whelan and Dr. Eric Kindwall

Harry T. Whelan, MD, lead editor, collected some of the most renowned practitioners in hyperbaric medicine to create this revised and updated 4th edition, which adds new information of interest to all in the field of diving and clinical hyperbaric medicine.

New contributors have written or revised most chapters, but many authors have returned to update their chapters. New chapters cover areas recently approved for hyperbaric oxygen treatment, such as idiopathic sudden sensorineural hearing loss and central retinal vein occlusion. There are also chapters about submarine rescue and problems that pertain to technical and rebreather diving.

This book will be an essential addition to the library of physicians, nurses, CHTs, CHRNs, and allied health professionals who practice clinical hyperbaric medicine and those involved with the treatment of injured divers.

**Save 10% during the presale,
which runs through June 28.**

The official book release will be **June 29–July 1** at the UHMS Annual Scientific Meeting in Naples, Florida.

Presale orders of the print book and book on PDF thumb drive will ship the week of **July 10**. The eBook version will be available starting **September 1**.



Dr. Whelan, a Milwaukee native, is professor of neurology, pediatrics and hyperbaric medicine at the Medical College of Wisconsin. He is also a captain and a diving medical officer (DMO) in the U.S. Navy and a consultant to the Navy Experimental Diving Unit (NEDU). He recently served as commanding officer of Marine Air Control Group 48 Medical and undersea medical officer for Deep Submergence Unit, which is the Navy's submarine rescue team and its deep-sea research component.



Oxygen and the Brain

By Philip B. James, MB, ChB, DIH, PhD, FFOM,

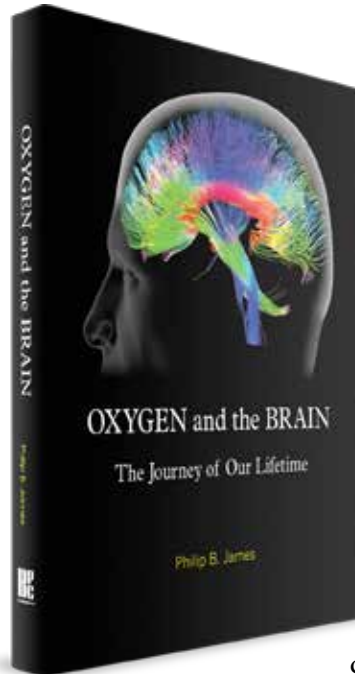
Emeritus Professor of Medicine, University of Dundee Scotland UK

Few people would dispute that the brain needs oxygen. *Oxygen and the Brain*, now released by Best Publishing Company for global distribution through Ingram, reinforces its importance.

It gives long-overdue recognition of the brilliant Scottish scientist John Scott Haldane, who pioneered many of the discoveries that today we take for granted. For example, Haldane showed that, curiously, it is carbon dioxide, not lack of oxygen, that drives breathing: A sudden reduction of oxygen level, in fact, increases cardiac output and blood flow, not breathing. He also advocated giving oxygen as a treatment, not simply as a supplement.¹

Oxygen is probably the most widely prescribed agent in medical practice, but it is only to ensure “saturation” of the oxygen reservoir hemoglobin: in other words, to ensure that blood is as red as possible.² The book points out that blood oxygen levels can be normal when a patient has a heart attack or a stroke because of a reduction of blood flow in an artery and because cells may die of lack of oxygen, which is called anoxia. The pathology caused by lack of oxygen extends well beyond the volume where cells die because of the localized tissue swelling known as edema.

Oxygen is poorly soluble in water. Cells in this zone are short of oxygen — not dead, but sleeping. Loss of function may be due to the death of cells or simply due to lack of sufficient oxygen to maintain their normal activity, a condition known as hypoxia (*hypo* meaning below and *oxia* obviously is oxygen).



These two states are widely separated in the brain but cannot be differentiated on clinical examination. The objective of using a high level of oxygen as a treatment, that is, “hyperoxia” — usually delivered in a room at increased pressure known as a hyperbaric chamber — is to allow cells to recover function from an inactive state.

The highlight of the book is an account of the astonishing research showing that oxygen actually controls our most important genes. Beginning with the creation of blood vessels in the embryo, a mechanism that continues throughout life in healing wounds³ from skin to the brain. It ranks in importance with the determination of the structure of DNA.

“[O]xygen actually controls our most important genes. Beginning with the creation of blood vessels in the embryo, a mechanism that continues throughout life in healing wounds from skin to the brain. It ranks in importance with the determination of the structure of DNA.”

Research into the effects of lack of oxygen is beginning to be featured in prestigious journals, such as the *New England Journal of Medicine* (NEJM). A nine-page review in the NEJM in 2011 highlighted the close relationship between cellular hypoxia and inflammation,⁴ and the latest review published in

the journal on May 18, 2017, details the physiological effects of chronic hypoxia.⁵ The author advocates oxygen conditioning of rooms at altitude by pumping oxygen in from an atmospheric oxygen concentrator, comparing it with air conditioning, suggesting it would improve boardroom decisions.

Tissue hypoxia affects us whenever we are ill or injured. Higher levels of oxygen are needed in treatment, especially for injuries and disease of the brain. It is the next frontier for mainstream medicine.

COMMERCIAL DIVER TRAINING MANUAL



The 6th edition of the *Commercial Diver Training Manual* is an almost total rewrite. Where previous editions were designed to be utilized in conjunction either the NOAA *Diving Manual* or the U.S. Navy *Diving Manual*, the 6th edition has been written as a stand-alone work that covers history, physics, physiology, diving medicine, and first aid in addition to diving techniques, diving equipment, and working underwater.

Updates in the 6th edition include the following:

- comprehensive rewrite that can be used as stand-alone reference
- extensive index
- easy-to-read formatting
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- colorful book cover

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“At its very core of commercial diver training are two essentials: going up and down in the water column safely and performing useful and effective work underwater. This textbook is the first to combine both of these objectives into a single, well-written resource. The author combines vast and diverse skill sets gleaned from decades of experience with the fundamental foundations of the U.S. Navy Diving Manual. This text is a must for the diving library of any working diver or entry-level trainee worldwide.”

— Don Barthelmess

Professor, Santa Barbara City College
Marine Diving Technology Department

Hal Lomax ran his own diving business for a couple of decades and at the same time operated his own school, where he wrote all of the course material and texts. In 2006, he went back to work offshore as a freelance supervisor. He is a founding member of the Divers Association International and currently sits on the Board of Directors as board member for Canada. Since hanging up his helmet at the end of 2007, Hal has worked in various locations around the world as a diving superintendent and supervisor.



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About the Author

PHILIP B. JAMES, MB, CHB, DIH, PHD, FFOM, is emeritus professor of medicine at the University of Dundee. He qualified in medicine from Liverpool Medical School, and after a fellowship in surgical research he studied industrial medicine in Dundee, Scotland. After Royal Navy training, he specialized in diving medicine, combining an academic post in the University of Dundee with consultancies to many international diving contractors, including IUC, Oceaneering, Comex, and Ocean Technical Services.



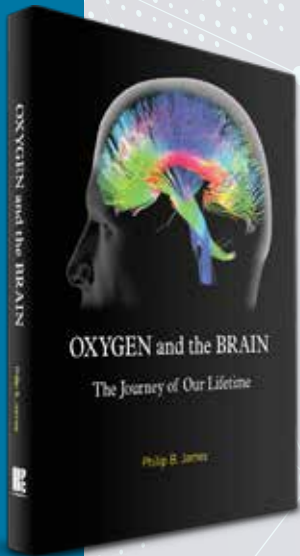
In 1983 he received the Craig Hoffman Award from the Undersea and Hyperbaric Medical Society for diver paramedic training and contributions to diving safety, including minimum oxygen content in helium, high oxygen partial pressures in divers' emergency supplies, and the use of helium/oxygen mixtures in recompression treatment. Dr. James also holds a US patent for a cabin membrane oxygen enrichment system for commercial aircraft.

In 1982 he published evidence for subacute fat embolism as a cause of multiple sclerosis in the *Lancet*, comparing the pathology to decompression sickness and endorsing the use of hyperbaric oxygen treatment. Later studies with Professor Brian A. Hills at the University of Texas in Houston showed that microemboli disturb the blood-brain barrier. Further research in Dundee demonstrated that inflammation, the hallmark of multiple sclerosis (MS), may produce profound tissue oxygen deficiency.

Five MS patients treated by Dr. James in 1981 founded a community hyperbaric facility in Dundee, and there are now 65 charity centers operating in the UK and the Republic of Ireland that provide low-cost hyperbaric oxygen treatment for neurological conditions. The centers were deregulated by Act of Parliament in 2008. Dr. James retired in the same year, but he continues as honorary adviser to the charity, as a consultant to the offshore oil and gas industry, and a passionate advocate for using oxygen in treating disorders of the brain.

Due to global demand,
Oxygen and the Brain: The Journey of Our Lifetime
by Philip James and ***Deep into Deco*** by Asser Salama
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OXYGEN AND THE BRAIN: *The Journey of Our Lifetime*

by Philip B. James, MB, ChB, DIH, PhD, FFOM

Following the human journey from conception to old age, *Oxygen and the Brain* presents evidence amassed over more than a century that can transform the care of patients with birth injury, head trauma, multiple sclerosis, and stroke and can even reverse decline in old age. There is no more necessary and scientific action than to correct a deficiency of oxygen, especially in the brain, and it is simple to give more.



DEEP INTO DECO

by Asser Salama

Deep Into Deco is a comprehensive and well-written reference text that covers various topics of decompression theory. It portrays the latest developments and controversial issues in technical diving in a way that is straightforward, easy to read, understandable and free from technical jargon.

From the early history of experimental trial and error to the latest innovations and changes in decompression concepts, *Deep Into Deco* brings the science into sharp focus. Without elaborating on mathematical equations or source code, the book demonstrates how commercial software packages calculate deco schedules. It also explores in detail a grab bag of additional points of interest that contribute to our current understanding of decompression theory.

With a writing style that is a mix of strict no-nonsense reporting along with interesting storytelling, *Deep Into Deco* includes interviews with accomplished divers, industry professionals, researchers and software developers.

This book is a must read for any diver who wants to understand decompression theory, how it evolved, what it accomplished and where the latest research is headed.

Begin Summer Training by Understanding the History Components of Evaluation and Management

By Gretchen Dixon, MBA, RN, CCS, CPCP, ICD-10-CM/PCS Trainer

Summer is the time to relax and catch up on to-do list items. This fits in especially for the elements of clinical documentation in the Evaluation and Management (E/M) visit levels, which need reviewing.

Now is the time to focus on this troubled topic of Evaluation and Management as they affect the accuracy score for your visit levels. Some may feel like this is drudgery in action again when there is a request of the provider to either clarify or add details into the clinical documentation. By tweaking your clinical information through adding details, you may bring forward those misplaced or partially forgotten nuggets of value (details relating to the patient's current visit).

The OIG in their 2017 Work Plan continues to monitor the data regarding the E/M levels billed, knowing our weak spots in the clinical documentation. The accuracy score after an audit of your E/M documentation will provide either a benchmark or validation of the compliance with clinical documentation expectations. These expectations are clearly documented by the Department of Health and Human Services (HHS) and the Centers for Medicare and Medicaid Services (CMS) with their Evaluation and Management Service guide, which is updated annually, with August 2016 as the most recent.

Take time to review your accuracy score. If it is below 90%, have your coder take a sample of five of your medical records, reviewing to validate the level of clinical documentation in supporting the level of billed services. Think of establishing 90% as a goal for your documentation improvement activity. Discussion will cover those areas of weaknesses discovered over the last year through provider audits and working with external auditors. There also will be

NOTE: Even though there is complete clinical documentation by the provider, the documented information may not be sufficient or relevant to explain medical necessity to government attorneys and auditors.

suggestions on how to improve your clinical documentation details, thus supporting the most accurate E/M visit level based on the patient's medical necessity.

Before starting any type of documentation, THINK-N-INK: "If it is not documented, it was not considered or not done." This sounds simple, but with today's busy practice, staff may forget to document thoughts or misplace notes — paper scratch notes may get lost or, worse, documented on the wrong patient's chart. It happens more frequently than you may expect.

Using the E/M history documentation components, this article will describe what providers need to document by thoroughly recording specific clinical information *relevant to the reason for the visit*. To reiterate, all clinical information must be relevant to the reason for the visit.

FOCUS: The documentation of each patient encounter should include:*

- Reason for the encounter (chief complaint) and RELEVANT history, physical examination findings and prior diagnostic test results
- Assessment, clinical impression or diagnosis
- Medical plan of care
- Signature and date of provider

*Per DHHS and CMS Evaluation and Management Services, August 2016

History Component Elements

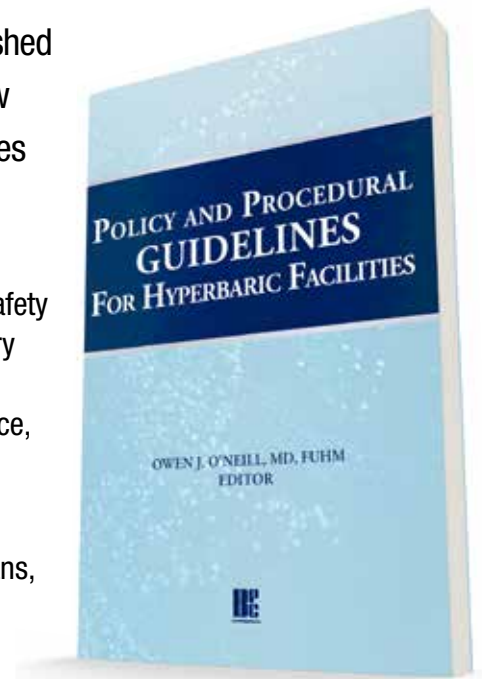
Within the history component are four elements that should be completed to their highest level of documented clinical information relevant to the reason for the visit: chief complaint (CC) or reason for the visit, history of present illness (HPI), review of systems (ROS) and past, family, social history (PFSH). The history components can

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be documented separately by element or inclusive in the History of Present Illness, as long as they can be specifically identified by the reader.

Chief Complaint (CC) Establishes the Need for Medical Necessity

The chief complaint, considered stage one of two in identifying medical necessity, sets the stage for which all other components in the medical record must be relevant. The CC should be a concise statement in the patient's own words describing the reason for his or her visit with the health-care provider. There should always be a documented statement from the patient for each visit.

Ensure there are specifics when documenting the CC. Avoid valueless CCs such as "here for follow-up," "patient returns today," "patient here for appointment" or "here for check-up." Ideally the CC could be the patient stating, "I am here for a follow-up about last week's MRI or test," which would be considered appropriate.

FOCUS: Ensure the chief complaint is documented in the patient's own words to establish the medical necessity of the visit.

History of Present Illness (HPI) Establishes Medical Necessity

Stage two provides the level of details supporting the need for medical necessity of the visit. The HPI provides the details of the condition by asking pointed questions to elicit patient responses relevant to the chief complaint. A chronological description of details about how the patient developed his or her present illness, the HPI should include the eight specific elements below. Each element is provided with but not limited to the following examples.

1. Location — area of the body, such as "lower right leg," or the site of problem or condition, always include documenting laterality when appropriate
2. Quality — the patient's description of the specific attribute or character of the symptom or condition
 - a. Pain, described as sharp, dull, throbbing, stabbing, constant, intermittent
 - b. Acute, chronic, stable, worse, scratchy
3. Severity — intensity, degree, measure of the symptom or condition
 - a. Rate pain on a scale of 1 to 10.
 - b. Pain description: "Worse I have ever had," "Not bad," "Severe," "Getting to the point where I can't stand it"
4. Duration — length of time the symptoms or conditions have been present

5. Timing — the onset of the symptoms, or when they occur
 - a. Worse at night
 - b. Hurts all the time
 - c. Only at night
 - d. Starts when I sit for more than an hour
6. Context — surrounding events
 - a. Where the patient is and what the patient is doing when the symptoms/problems begin
 - b. Situational stress-anxiety episodes due to life event
7. Modifying factors — what was done to alleviate the symptom or problem when it happens
 - a. Ice pack or heat applied
 - b. Antibiotic cream
 - c. Tylenol for pain
 - d. Must lay down
8. Associated signs and symptoms — additional signs and symptoms related to or part of the patient's problem(s) that may not fit in any of the other categories

The HPI often lacks the amount of details describing the history of the present illness that external auditors are beginning to focus on. In the wound care environment, there needs to be a consistency of documented details on the past treatments, interventions and other medical care provided to the patient for the specific condition to include both positive and negative outcomes. It is this level of detail that supports the medical necessity and demonstrates the higher level of acuity, complexity of care and intensity of services the patient requires.

Now with the understanding of the importance of setting and establishing the medical necessity for the visit with the CC and HPI, it is vital to recognize that all the other components in the E/M must be relevant to both items. Copying and or pasting past clinical information does not always provide the relevancy for the visit. This process may actually be detrimental to the content of clinical information.

The HPI is one area in which your E/M visit level may be down-coded a level during an audit.

FOCUS:

- Establishing medical necessity with clear and accurate clinical documented details of the patient's problem.
- Review current documentation process to improve by adding value to the clinical information, ensuring all eight elements are included.

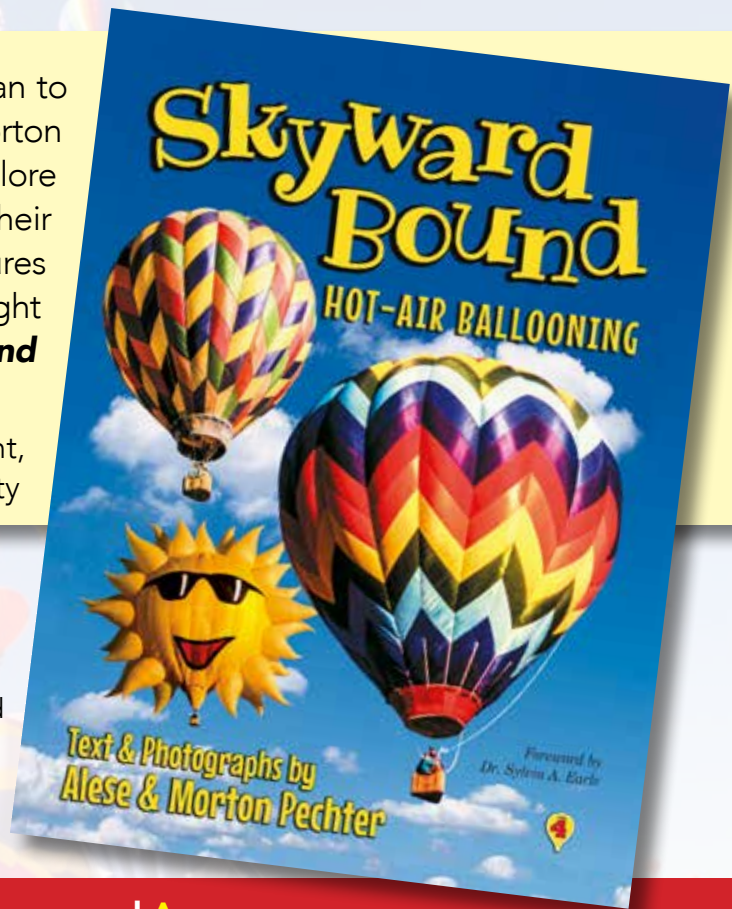
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ABOUT THE AUTHORS:

Alese and Morton Pechter are world-renowned photo-journalists and authors. They have flown and photographed hot-air ballooning for more than a decade and their work has appeared in periodicals and texts internationally.



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About the Author:

Dr. Neil Hampson, a Seattle native, is a retired pulmonary, critical care, and hyperbaric medicine physician. He has an international reputation in hyperbaric medicine, specifically in the area of carbon monoxide poisoning. During his clinical career, he treated more than 1,000 patients with carbon monoxide poisoning and published numerous papers in medical journals about the condition.

Review of Systems (ROS)

The review of systems is another component where external auditors are beginning to focus due to recognizing another area in which clinical documentation is weak when validating the E/M visit level. The ROS entails inquiries or questions concerning the system(s) directly related to the problem(s) identified in the HPI. This is a different interpretation from the past, when all systems were identified either by the patient completing a dedicated form or the ancillary staff asking questions of the patient and documenting the patient's response. The HHS and CMS Evaluation and Management Services (published August 2015 and 2016, respectively) notes on page 7: "ROS inquiries about the system directly related

to the problem(s) identified in the HPI and a number of additional systems."

Past, Family, Social History (PFSH)

Although this element is usually documented only at the time of the initial visit, if a patient is on medications that may change between visits, the medication list must be updated. If a follow-up visit results in an E/M, then the medication needs to be recorded under the past medical history.

FOCUS: Although a wealth of information is recorded in the PFSH element, take credit only for the information that is relevant to the problem(s) identified in the HPI.

Any relevant medical updates such as tests, interventions, and procedures since the last visit need to be included in the documentation. Additionally, when a patient advises of "no known allergies," this is always considered a part of the patient's past medical history.

In the past, we have been accustomed to taking credit for everything documented in this section whether it is relative or not to the reason for the visit. As stated in the HHS/CMS Evaluation and Management Services documentation guide,

NOTE: Never record the phrase "no known allergies" in the ROS for the allergic system. It belongs under the patient's past medical history in the PFSH element.

FOCUS: Ensure credit is only for those systems relevant to the problems identified in the HPI.

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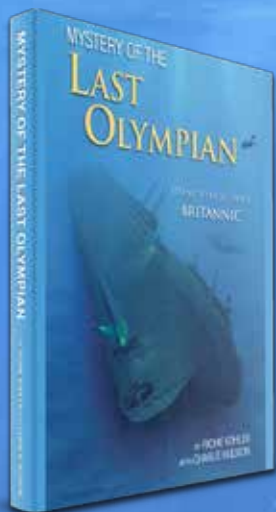
Jennifer Idol is the first woman to dive 50 states and author of *An American Immersion*. She's earned more than 27 certifications and has been diving for 20 years. Her photography and articles are published in *DIVER*, *Sport Diver*, *Alert Diver*, *SCUBA Diving*, *X-Ray Mag*, *Outdoor Oklahoma*, *Underwater Speleology*, *SCUBA & H2O Adventure*, and *Texas Aquatic Science*.



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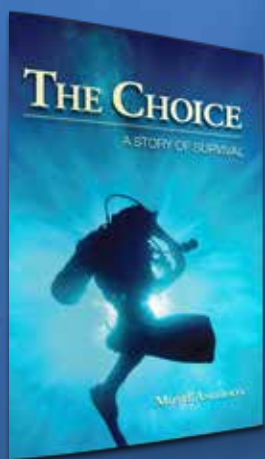
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~ Jean-Michel Cousteau, explorer, environmentalist, educator, and producer

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THE CHOICE: *A Story of Survival*

by Monte Anderson

As three friends drove across the Navajo Reservation in northern Arizona after backcountry skiing in Colorado, they talked about their lives. Then one said, "I really shouldn't be alive today."

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About the Author: Monte Anderson completed a medical residency at Creighton University and continued his studies with subspecialty training in gastroenterology and hepatology as an army officer at Fort Sam Houston in San Antonio, Texas. After his discharge from the military, most of his career was happily devoted to the Mayo Clinic in Arizona. Feeling that true tales tend to be more compelling than fiction, he has always preferred reading nonfiction, especially since something is always learned in the process. *The Choice: A Story of Survival*, his first effort outside of scientific writing, is nonfiction.



"Dr. Monte Anderson makes his debut in nonmedical writing with *The Choice: A Story of Survival* and does so with a splash. The nonfiction book relates the fascinating story of his friend's 1982 diving accident near a remote island in Mexico. Dr. Anderson's recounting of the details reflects his tremendous investigative ability, as well as the diver's will to survive."

~ Neil B. Hampson, MD, author of *Cherry Red*

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however, documenters are specifically notified that the PFSH is a review of the medical, family and social history areas directly related to the problem(s) identified in the HPI. Auditors will remove credit for information not relevant to the medical problem in the HPI.

Synopsis of History Elements

As you read through the above history elements, you should have discovered two common threads that must be followed to avoid overreporting of an E/M visit level. The first is establishing and validating medical necessity, and the second is ensuring all elements documented are relevant to the identified problem(s) in the HPI for credit of this component supporting the reported E/M visit level.

Irrelevant information added through the electronic health record (EHR) by the automatic populating option of copying and pasting past information into these components is easily discoverable. Often providers do it to try to save time from having to document similar information. If an audit discovers the irrelevant clinical documentation, the visit level may result in a lower visit level. Is this activity worth the risk? The risk is not only overcoding a visit level but also possibly having a pattern discovered, which may require an extensive retrospective audit, possibly validating a pattern of overbilling visit levels resulting in false claims. Now you have entered the realm of compliance issues involving not only governmental payers but also third party-payers.

About the Author

GRETCHEN DIXON, MBA, RN, CCS, is the owner of Professional Compliance Strategies (PCS), LLC, and consults on outpatient departments and physician services. She has provided revenue-cycle compliance audits of services with a focus on wound care department operations for more than 10 years. She holds several credentials including an MBA in healthcare management, an RN with a practicing license in New York, and 23 multistate licensure from Virginia, AHIMA Certified Coding Specialist (CCS), AHIMA ICD-10-CM/PCS Approved Trainer, and is an AAPC Certified Professional (Healthcare) Compliance Officer. A longtime internal healthcare auditor, Dixon identifies issues through audits of D, C, B (documentation, coding and billing) of provided services. The outcome of each audit determines the topics of education to be provided to the staff and physicians, as she proactively believes education is the key to having complete, accurate, and consistent documentation supporting reimbursement for billed services. If you are interested in her services, contact Dixon at gmdixon@cox.net or call 1-615-210-7476.



Third party-payers are increasing their audits, picking up on what Medicare has audited for years knowing E/M levels supporting clinical documentation has a deep weakness, resulting in anticipating overpayments to be refunded. (Refer to the Federal Register dated February 12, 2016, titled “Medicare Program: Reporting and Returning of Overpayments; Final Rule.”)

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Resources

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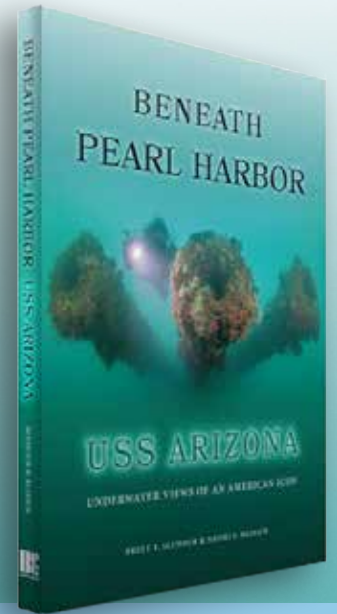
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Brett Seymour is the Deputy Chief of the U.S. National Park Service's Submerged Resources Center (SRC).

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Protective Footwear

Part 4B (of 5) in the Diabetic Wound Prevention series

By Anna M. Tan, Michael B. Strauss, and Lientra Q. Lu

In the previous issue of *WCHM*, Part 4A in the Diabetic Wound Prevention series provided detailed descriptions of shoe characteristics and sock components along with various types of protective footwear, ranging from quality athletic walking shoes to Charcot restraint orthotic walker (CROW) boots. Now, in Part 4B, we continue to expound on protective footwear as an essential component for the prevention of new and recurrent wounds by addressing some common misconceptions and discussing custom foot orthotics and total contact casting (TCC). In addition, this article details the Medicare “Therapeutic Shoe Bill” and highlights a few challenging situations in which protective footwear may be insufficient and surgery and other interventions may be necessary.

Making Sense of Orthotics

Orthotic considerations. In the previous section, orthotics were mentioned as a prescription item added to off-the-shelf footwear to control alignment of the feet and ankles. Simply stated, orthotics are devices that improve or straighten the alignment of body parts. They can be as simple as a heel pad added to a shoe or as complicated as a total-control lower-extremity brace.

Orthotics play an important role in prescription footwear because deformities are frequently a precursor to foot wounds. Many patients with feet that are at risk for wounds have deformities.

The three largest user groups for orthotics are children with foot concerns articulated by their parents, athletes and others who experience foot pain with activities, and patients who have neurological impairments (especially patients with diabetes).

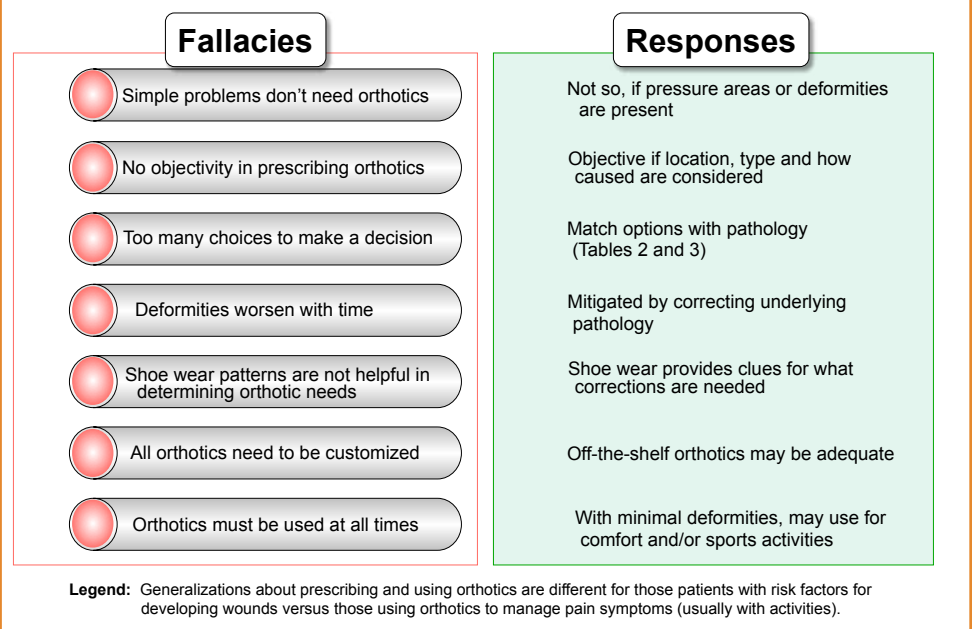
Much confusion exists as to what orthotics do and when they are needed (Figure 9).⁸ The consequences of this are overutilization, inappropriate applications, and needless expenditures for these devices. The following information discusses seven misconceptions and/or fallacies pertaining to orthotics. The goals are twofold: to make sense out of their use and to delineate their indications

for foot conditions at risk for wounds (Table 3). Indications for prescribing and using orthotics are different for those patients with risk factors for developing wounds (deformity, previous amputation, previous wound, peripheral artery disease and/or neuropathy) versus those using orthotics to manage symptoms that are associated with walking and running.

Misconception 1: A minimal discrepancy or deformity — for example, mild flattening of the feet or tilting of the heels — never needs an orthotic.

Fact: The answer to this question is tricky. If the problem causes symptoms — for example, pain, stiffness, soreness,

FIGURE 9. Fallacies and responses regarding orthotics



A good example of the effective use of an orthotic is in the situation of a shortened limb. The shortening will cause a person to limp and lean to the side when standing unless compensatory measures are done, such as bending the opposite knee or the spine. This puts an extra strain on the muscles and joints that control these body parts and will likely become a source of pain.

The easiest solution is to add a lift to the shoe of the shorter extremity to equalize the extremity lengths. This will correct the alignment and prevent the extra stresses and strains placed on the body parts used to compensate for the limb length discrepancy.

Comment: This exemplifies the principle of using an orthotic. In the case of the foot at risk with deformities, one role of orthotics is to prevent wounds.

TABLE 3. Frequently observed foot deformities and their orthotic management

Problems	Type/How Manifested*	Orthotic Management
Location: Primarily the Forefoot		
Metatarsus adductus (In-toeing, adduction)	Planar/Static with dynamic components	Straight or reverse last shoes Lateral heel +/- medial sole wedges; pronator pads (all of questionably benefit; usually improves spontaneously with time)
Metatarsus abductus (Out-toeing—abduction, "skew" foot)	Same as above (SAA)	Medial heel and/or lateral sole wedges; pronator pads (all questionably effective)
Toe deformities (Mallet, hammer, claw, angulated or rotatory)	Most are planar & static with dynamic components	Toe separators, lambs wool between toes, shoes with large toe boxes
Forefoot supination (Inversion)	Non-planar/Static with dynamic components	Lateral forefoot wedges for inserts and or soles of shoes; if due to Charcot neuroarthropathy, consider CROW (Charcot restraint orthotic walker) boot
Forefoot pronation (Eversion)	SAA	Medial forefoot and/or sole wedges
Location: Primarily the Midfoot (Arch portion of the foot)		
Flatfoot (Pes planus)	Planar/Dynamic, but accentuated with loading	Arch supports; if asymptomatic, leave untreated
Hyperpronation	Usually with hindfoot valgus + flat feet	Custom molded arch supports with medial heel wedges
Cavus foot (Abnormally high arches)	Planar/Static	Custom molded arch supports supplemented with forefoot and heel pressure relief pads
Congenital vertical talus	SAA	Custom shoes; generally not manageable with footwear and orthotics; surgery usually required
Location: Primarily the Hindfoot (Heel portion of the foot) and Ankle		
Varus heel (Inward tilting, supination)	Non-planar/Static	Lateral heel wedges; frequently in association with forefoot and midfoot supination management
Valgus heel (Outward tilting pronation))	SAA	Medial heel wedges; usually in conjunction with midfoot hyperpronation management
Equinus contracture	Planar, non-planar (with hindfoot varus/Static)	Heel lifts; Klenzak brace; management of heel varus; Frequently Achilles tendon lengthening required
Location: Combinations (Involvement of 2 or more foot & ankle components)		
Clubfoot (Heel varus, forefoot adduction + ankle equinus)	Non-planar/Static	Casting, Achilles tendon lengthening; custom orthotics as needed
Charcot arthropathy	SAA	The apex of the hierarchy of prescription footwear; see Figures 2 through 8
Zig zag (skewfoot) (planar deformities in 2 or more directions)	Planar/Static	Custom molded shoes; surgery

Notes: * **Type** refers to plane of the foot; **planar** indicates it is flat, while **non-planar** means it is tilted (e.g. varus vs valgus; pronation vs supination; inversion vs eversion, etc.)

How manifested refers to whether it is **Static**, that is the deformity is presented when the foot is un-loaded or **Dynamic** that it occurs with loading, muscle contraction and/or walking.

swelling, etc. with activities or signs of irritation of the skin are observed at the deformity site — it should be managed with orthotics (or other offloading techniques). The question is tricky because if the person can do the activity without symptoms, as is often the case in athletes or children, orthotics are not needed. If the foot is at risk for wound formation, however, everything possible, including orthotics (and other offloading measures), should be done to prevent a wound from developing due to the multiplier effect of repetitive sub threshold (i.e., below the severity to generate an acute ulceration, but enough to generate erythema, callus formation and/or pain) stresses.

If a deformity, albeit minor, places extra work on muscles and joints or places extra stresses on the skin, problems from repetitive stresses, such as those that occur with walking, have a multiplier effect.

For example, a problem that requires a muscle to contract only 1/16th of an inch more than normal may have to move an extra 27 1/2 feet with walking a mile (assuming a stride length of 12 inches) than muscles not having to work as hard during the mile walk. In the situation of contact pressures to the skin, 1/16th of an ounce more weight to the skin with each step subjects the skin to more than 300 pounds of summated extra contact pressures over the deformity with the mile walk.

Misconception 2: *There is little objectivity in deciding what situations require an orthotic.*

Fact: Objectivity in prescribing orthotics is afforded by pairing the patient's symptoms with the following signs:

- **Imbalances** refer to alterations in muscle control that lead to abnormal posturing of joints. Some muscles may become overactive, while others may be so weak that they cannot counteract

the antagonist muscles' activities. Diabetes, nerve injuries/spinal cord injuries, strokes, Parkinsonism and hereditary conditions are the most frequent causes of muscle imbalances. With time, contractures arise and joints become permanently deformed.

- **Contractures** arise in joints when imbalances persist or joints are positioned in the wrong position for sustained periods, such as with casting. Joint stiffness and decreased range of motion are findings associated with contractures. A joint contracture is defined when the loss of motion becomes fixed — for example, an equinus contracture from shortening of the Achilles (calf) tendon/muscle group. When this occurs, the ankle can no longer be brought to the neutral position.
- **Deformities** are structural changes in the anatomy of the foot and ankle such as bunions, Charcot neuroarthropathies, forefoot adductus, hindfoot varus or depressed metatarsal heads (the precursor of forefoot mal perforans ulcers). Deformities arise from muscle imbalances as observed with clawing of toes, loss of ligament support, bony overgrowth from repetitive pressure/shearing stresses, structural abnormalities of bone (e.g., spurs, malalignments after fractures, congenital anomalies, collapses associated with Charcot neuroarthropathy, etc.). Many deformities are amenable to management with orthotics as will be described in the third misconception in this section.

When orthotic selection is addressed from these three perspectives, logical decisions become obvious. When sensation is absent, as is so frequently observed in patients with problem wounds, the decision for orthotic selection is made from the above

signs. When these problems are not manageable by orthotics, then surgical interventions, many of which are minimally invasive and can be done in the office setting are needed. This is in contrast to athletes where pain symptoms are the indication for obtaining orthotics.

***Misconception 3:** So many deformities can occur in the foot and/or ankle that it is difficult to make decisions as to what orthotic is appropriate.*

Fact: Although more than a dozen deformities may be ascribed to the foot, they can be readily understood if considered from the following elements (Table 3): 1) **location** (forefoot including toes, midfoot, hindfoot or combinations), 2) **type** (such as primarily a) planar — the foot remains flat such as with abduction, adduction and equinus) or b) nonplanar — the normal flat surface of the foot is tilted as observed in hyperpronation-eversion-valgus or supination-inversion-varus deformities), and 3) **how manifested** (dynamic implies that the problem occurs with activity whereas static means the problem is fixed and present whether at rest or with activity). Each problem may be due to a single element or compound — that is, consisting of two or more of the above elements.

***Misconception 4:** Foot deformities invariably worsen with time; hence orthotics should be used as soon as a problem is recognized.*

Fact: Judgment is essential for making decisions about when to prescribe orthotics. The majority of foot deformities in children such as in-toeing, flat feet, and toe walking resolve spontaneously as the child matures. In the presence of neurological impairments (e.g., cerebral palsy, myelodysplasia, polio, etc.), spontaneous correction is not likely to occur. Orthotics and/or surgical interventions should be utilized early to prevent worsening deformities.

For adults with asymptomatic, nonprogressing deformities, orthotics are not indicated. For adults who develop new deformities such as hyperpronation of the midfoot (e.g., secondary to posterior tibial tendon dysfunction), especially those with risk factors for developing foot wounds, orthotics and protective footwear are indicated as soon as the problem is recognized. The goals are to prevent the deformity from progressing and/or the development of wounds that could require surgery in the future.

***Misconception 5:** Shoe comfort and wear patterns are nonreliable indicators of the need for orthotics.*

From the above information, some terms refer to specific locations, while other terms overlap. Varus and valgus type deformities imply a single location such as the heel, forefoot or ankle. Pronation type deformities are generally ascribed to the midfoot. Often hindfoot valgus occurs in association with midfoot pronation. Abduction and adduction deformities are used to describe forefoot abnormalities. External and internal rotations refer to the foot position with respect to the leg. Supination, eversion, and inversion are terms implying involvement of the entire foot.

Static manifestations refer to the deformity being present without loading. Dynamic deformities become apparent with muscle activity, loading and movement. In general, dynamic deformities in nonneurologically impaired individuals do not require orthotics when they are present in the absence of pain.

In contrast, dynamic deformities in the patients with neuropathies require interventions, initially with protective footwear and, if not successful, surgery. This is because this latter group of patients is prone to develop pressure ulcerations from their deformities with activity, but not recognize them until the wounds have already occurred.

Fact: Shoe comfort and wear patterns provide important clues for decision making about orthotic selection. In the normal foot, shoe wear is first noted along the lateral edge of the heel and the center portion of the toward end of the sole. As the shoe wears, the upper materials may stretch to accommodate a deformity, and in the absence of sensation, the patient may not complain of pain in the shoe as it is stretched out.

Obviously pressure areas are deforming the shoe and can evolve to ulcerations at the deformity site. If the shoe is uncomfortable, explanations are needed and proper adjustments made. Shoe-wear patterns also provide helpful information. For example, if the upper, medial portion of the sole of the shoe has excessive wear, pronation (eversion) is usually the explanation. Excessive medial heel shoe wear indicates excessive hindfoot valgus. These problems need to be recognized and managed with orthotics if the patient has risk factors for developing foot and ankle wounds and/or the deformities are a source of pain.

Misconception 6: *If orthotics are indicated, they need to be customized.*

Fact: Many conditions for which orthotics are indicated can be managed by simple corrections such as adding a padded insert, an off-the-shelf metatarsal pad, a heel pad, a toe separator, a donut pad or similar devices.⁹ Many of the padded inserts have additional features such as padding to counteract pronation and gel inserts to provide extra heel or forefoot padding. The off-the-shelf devices usually cost a fraction of custom-molded orthotics. If they relieve symptoms and offload pressure areas, more costly customized orthotics are not indicated. Two guidelines are recommended for prescribing custom-molded orthotics: First, in patients with normal foot sensation, they should be

Lambswool is a very effective padding/offloading device. Ballet dancers use lambswool to protect their toes en pointe (i.e., toe dancing) because it does not compress and it concentrates forces as pressure is applied to it. Additionally, it does not lose its form and function from moisture. For these reasons, patients with pre-ulcerative lesions on their toes or in need of filler for missing toe parts, can use lambswool as an effective, inexpensive toe separator or pressure distributor and/or filler in their shoes.

Like other fabric materials, it will become soiled with use and retain odors, so the lambswool padding must be changed on an as-needed basis when these conditions are observed.

obtained after a trial of less-expensive off-the-shelf versions have been tried, but the off-the-shelf choices provide only partial or no relief of symptoms. Second, in patients with sensory neuropathy and associated deformities, prescription orthotics and footwear are usually indicated even without a trial of off-the-shelf devices.

Misconception 7: *If orthotics are obtained, they need to be utilized 100 percent of the time with footwear.*

Fact: For patients with normal sensation, orthotics may need to be used only for repetitive stress activities such as running. Running activities multiply and replicate the stresses through the feet more than three times the person's body weight, somewhat analogous to driving a nail into a board. If symptoms are not noted with standing or walking, orthotics need not be used for these activities. In patients subject to foot or ankle ulcerations because of sensory neuropathy or other risk factors for wounds, the orthotic is used to prevent a wound from occurring and consequently should be utilized with all standing and walking activity.

Prescribing Orthotics

In summary, the decision to prescribe orthotics should be based on the patient's complaints, the problems (e.g., muscle imbalances, contractures or deformities) found during the exam and what is the most cost-effective way of managing it. For patients with normal sensation, many orthotic

The driving the nail into a board analogy is good one when considering what happens with repetitive multiplier forces. The hammer merely resting on the nail will not drive the nail into the board. With each strike, however, the force of the hammer head is multiplied manyfold (i.e., its kinetic energy) thereby driving the nail into the board.

Clinical correlations: A 38-year-old healthy male began to experience unilateral left midcalf pain during running activities. Typically, symptoms did not occur until 5 miles into a 7- to 10-mile run. Although concern was raised that the patient may have a chronic exertional compartment syndrome, examination demonstrated a hypermobile left forefoot, and his symptoms were attributed to a chronic, overuse calf muscle strain with running activities.

The insertion of a quarter-inch heel lift into his running shoes eliminated his pain symptoms with long runs. The lift was not used for regular walking activities.

Comment: By reducing the excursion of the left calf muscles with the quarter-inch heel lift, the summated repetitive forces to the calf muscle were substantially reduced over a 7-mile run (quarter inch less excursion with each step • multiplied by the patient's 180-pound body weight • multiplied threefold with stance phase loading • times 2,000-foot stance phase loadings — assuming a 3-foot running stride — for each mile • times 7 miles summates to more than a million foot pounds force reduction for the left calf muscles with the lift during the run).

WOUND CARE CERTIFICATION STUDY GUIDE

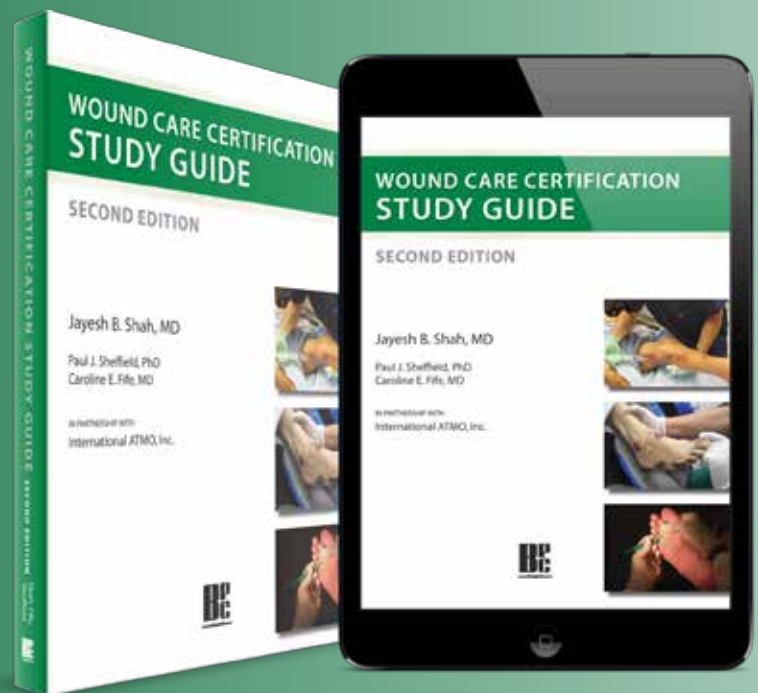
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requirements can be met with off-the-shelf devices. Custom-made orthotics should be prescribed by physicians familiar with the evaluation, management and prevention of foot and ankle problems and obtained through pedorthotists and podiatrists familiar with the options and available applications. In patients with neurological impairments, associated deformities and the other risk factors for foot and ankle wound occurrence, custom-prescribed orthotics and protective footwear are advised because this is the at-risk group for developing problems.

Total Contact Casting (TCC)

Although total contact casts (TCC) have been considered the gold standard for offloading, recurrence rates with TCC after healing and compliant use of protective footwear approach 50 percent.¹⁰ TCC is often recommended for outpatient management of diabetic

foot ulcers, especially in forefoot locations; these ulcers, however, typically occur because of underlying deformities. When the ulcers occur in the midfoot and hindfoot, and especially if hospital management is required to manage the deformity, TCC is usually not sufficient and surgery is required.

Historically, there is an extremely low use rate by clinicians and poor patient tolerance due to logistical purposes. First, the cast usually must be removed if the provider wants to examine or treat the wound; and the process of placing the TCC is quite time-consuming (Table 4). Second, it is not recommended for patients with underlying bony infection, deep sinus tracts, large draining wounds, dermatitis, excessive edema, severe peripheral arterial insufficiency, and “cast claustrophobia.”

Inappropriate Use of Protective Footwear

In some situations, protective footwear will not provide adequate offloading. The wound care provider must appreciate this and not persist with new and/or alterations of the patient’s protective footwear in hopes of achieving a solution while the wound deteriorates and/or recurs. In such situations surgery and other interventions become necessary. In many situations, the causes are multifactorial, and the solutions require more than one intervention. In almost all cases after interventions, properly prescribed protective footwear is required. Consider the following challenges and their solutions:

1. **Challenge:** Progressively worsening deformity such as a subluxing ankle joint with increasing angulation and impending breakdown of skin over

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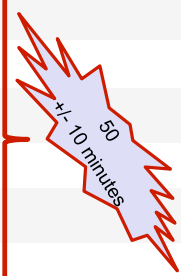
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TABLE 4. Total contact casting application

Steps	Estimated Time Required	Comment
Cast Removal	10 minutes	Care to not cut skin
Cleanse & lubricate skin	5 minutes	Remove debris
Dress wound	5 minutes	Cutouts/Offload
Apply padding	10 minutes	Care to not cut skin
Protect bony prominences	5 minutes	Felt or foam rubber
Apply plaster/allow drying	10 minutes	Improves molding
Apply fiberglass	10 minutes	Strength & durability
Cast shoe/mobilize	5 minutes	Walking challenges



Preparations

Plaster & Fiberglass Application



Padding

Mobilization

the apex (e.g., the lateral malleolus) of the deformity (Figure 10)

Solution: Osteotomy to realign ankle and intramedullary ankle rodding or temporary external fixation with the ankle in the reduced position. Extremity shortening secondary to the osteotomy should be equalized with shoe lifts.

2. Challenge: Protruding bone or bony prominence at the base of an ulcer that has not improved with offloading

Solution: Exploration and debridement of bony prominence (i.e. osteotomy), reactive bursa and cicatrix formation surrounding the deformity

3. Challenge: Recurrences of a malperforans ulcer under a metatarsal head after healing with total contact casting and use of protective footwear

Solution: Realignment of metatarsal head with simple percutaneous scoring of the metatarsal at the neck level and osteoclasia to direct the

metatarsal head dorsally. A Weil osteotomy is also an option but is more invasive and requires internal fixation.

4. Challenge: Hindfoot ulcer with loss of heel foot pad and boney

prominence in base of wound without an ankle dorsiflexion contracture (i.e., muscle imbalance with loss of gastrosoleus muscle strength)

Solution: Partial calcaneotomy with ankle fusion or release of ankle dorsiflexors

5. Challenge: Flail midfoot with severe destruction of midfoot bones secondary to Charcot neuroarthropathy

Solution: Resect nonfunctional midfoot bones to shorten foot length with or without bone grafting

6. Challenge: Claudication with rest pain regardless of footwear

Solution: Lower-limb amputation

7. Challenge: Severe equinus contracture with plantar surface pressure sores at the tips of the toes

Solution: Achilles tendon lengthening

8. Challenge: Morbid obesity and/or massive lymphedema

Solution: Edema control, weight reduction including surgical techniques, wheelchair ambulation

FIGURE 10. Deformity where protective footwear becomes inadequate



Legend: Severe deformity with infected lateral malleolus exceeds the ability of a CROW boot or total contact casting to manage. Surgical realignment or below knee amputation become the options.

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9. Challenge: Dry, scaly atrophic plantar forefoot and heel fat pads
Solution: Daily skin cleansing and lubrication; optimal shoe padding and fit

10. Challenge: Abnormal, excessive shear forces with walking secondary to muscle imbalances, weaknesses or deficiencies secondary to neurological conditions or trauma
Solution: Physical therapy and gait training; orthotics to mitigate deformities; walking aids from cane to motorized wheelchair

In some situations, ambulation needs to be restricted or almost totally avoided to prevent new or recurrent foot wounds regardless of the interventions. Fortunately, other options for mobility exist, such as wheelchairs and motorized scooters/wheelchairs. When such assistive devices are prescribed, it should not be considered a failure of protective footwear or management but rather insight to the total needs of the patient.

Medicare Therapeutic Footwear Benefits

Therapeutic Shoe Bill. It is no coincidence that Medicare (Center for Medicare/Medicaid Services) provides funding for diabetic footwear. In 1993 the Therapeutic Shoe Bill (TSB) benefit became a Medicare entitlement for diabetic patients.¹¹ This policy exemplifies the goals of preventative medicine. It provides a mechanism for diabetic patients with risk factors for developing foot wounds to obtain protective footwear. Most significantly, this benefit is proactive (in contrast to many of the other Medicare entitlements), as it provides a means to prevent a problem from occurring rather than the much more expensive alternative of treating it after it has already arisen.

This entitlement provides tangible benefits with protective footwear rather than only education, as in smoking-

prevention, need for exercise and weight-reduction programs.

Stipulations of the Therapeutic Shoe Bill. The TSB benefit has several stipulations: First, the beneficiary must have Medicare Part-B (physician services) coverage. Second, a signed certificate of medical necessity (CMN) is needed from the prescribing physician that therapeutic footwear is required; the CMN should include the following four affidavits:

- The patient has diabetes mellitus
- The patient has one or more of the following conditions involving either foot:
 - history of partial or complete amputation of the foot
 - history of previous foot ulceration
 - history of preulcerative callus
 - peripheral neuropathy with evidence of callus formation
 - foot deformity
 - poor circulation
- The prescribing physician is treating the patient under a comprehensive plan of care for his/her diabetes
- The patient needs special shoes (extra depth or custom-molded shoes), inserts or modifications because of his/her diabetes

Third, the prescription for therapeutic footwear is written by a qualified physician, that is someone knowledgeable about protective footwear and inserts. Finally, the therapeutic footwear must be supplied by a pedorthist, other qualified individual, or a retail store that sells footwear approved by the TSB.

Replacements and costs. Medicare therapeutic footwear benefits are provided yearly. In a given calendar year, Medicare will cover 80% of the allowed amounts for one of the following:

- one pair of off-the-shelf extra-depth shoes plus three pairs of multidensity inserts

- one pair of off-the-shelf extra-depth shoes including modifications (such as fillers, lifts, wedges, relief for pressure areas, etc.) plus two pairs of multidensity inserts
- one pair of custom-molded shoes plus two pairs of multidensity inserts each year

It is important to note that the TSB is not a program intended to provide shoes for all diabetics, but its primary goal is to prevent ulcerations/ amputations in the at-risk patient.

This means that the patient or the patient's secondary insurance is responsible for paying the remaining 20 percent of the bill at the time the shoes and/or inserts are dispensed if the supplier accepts Medicare assignment. If not, the patient needs to pay the supplier and submit the paper work directly to Medicare for reimbursement.

By the footwear/insert provider accepting assignment, it is understood that the charges for the protective footwear will conform to what Medicare considers reasonable and customary.

Alternatives to the Therapeutic Shoe Bill.

Although the Medicare TSB applies specifically to diabetic patients, are there other alternatives for patients with problem wounds or risk factors for developing problem wounds who do not have Medicare Part-B benefits? The answer is a somewhat qualified yes. Many state Medicaid programs have provisions that parallel the Medicare guidelines. Private insurance companies may or may not have provisions for protective footwear. If the footwear is indicated, however, a "letter of petition" by the prescribing physician to the insurance carrier describing the problem and the justification and the predicted cost-benefits for protective footwear is often sufficient to obtain

A clinical correlations: A 25-year-old male metal worker sustains a crush injury to his left foot when a 1,000-pound plate falls on his foot, necessitating a modified (the lateral two rays removed to the level of the cuboid) transmetatarsal amputation.

Although his insurance benefits provide a prosthesis for a below-knee amputation, they specifically exclude providing off-the-shelf shoes with modifications.

A “letter of petition” was submitted to the insurance company explaining the necessity for protective footwear for the patient. The letter included three major arguments. First, without the prescribed protective footwear, the patient was at risk of developing new problems that could result in costly hospitalizations and an even higher-level amputation. Second, with the prescription footwear, there would be a high likelihood that the patient could return to his previous level of work without restrictions. Third, other insurance providers, including Medicare, have provisions to address this problem.

With the “letter of petition,” the request for protective footwear was approved for the patient.

Comment: Insurance carriers are more likely to respond to out-of-network benefits when the benefit is cost-beneficial, allows the patient to return to his/her usual and customary activities and is a provided by Medicare or other third-party carriers.

reimbursement for the footwear. A third alternative is for the patient to pay for the protective footwear/inserts himself/herself. Many times, charges for similar items vary considerably from one supplier to another and/or discounts are given for paying cash.

For nonwound prevention considerations, such as pain relief with running, the patient may have to pay for the custom orthotics out of pocket. Finally, less costly alternatives such as using lambswool for fillers and toe separators, off-the-shelf inserts, shoes with built-in pronation inserts, casts, etc., can be used as an interim measure when it is not possible to obtain custom protective footwear.

Do's and Don'ts Pertaining to Protective Footwear

Do's with respect to protective footwear:

- Wear appropriate footwear for your foot and ankle problems.
- Frequently check shoes and orthotics for signs of wear or poor fit.

Don'ts to prevent new or recurrent foot wounds

- Don't walk barefooted (use

protective footwear at all times when out of bed).

- Don't assume a new pair of shoes, even if provided from a footwear prescription, will fit perfectly. “Break them in” slowly, initially wearing the shoes for only for a few minutes at a time and then removing them to inspect the skin for pressure areas or signs of rubbing.
- Don't wear inappropriate shoes for fashion reasons or because they feel comfortable (such as house shoes and slippers without appropriate support).

Conclusions

The selection of protective footwear is both an art and a science. The science is reflected by the wealth of information available about the components of footwear, the variety of choices available for protective footwear and orthotics and the ability to confirm by examination and imaging studies what the structural problems are. The selection of protective footwear is also an art. Decisions have to be made as to what level of the protective footwear hierarchy is appropriate for the patient. Foot and

ankle problems are frequently unique and require individual modifications for the shoe. Foot problems change, so what is appropriate initially may require alterations in the future.

It is obvious that “If the shoe fits, don't always wear it.” This has several implications. First, patients may prefer to wear their old, worn, deformed shoes because they feel so comfortable instead of their new or replacement footwear.

Second, newly prescribed footwear often requires modifications to fit properly. The more complicated the problem, the more likely modifications will be required. In our experiences, about 50 percent of the footwear prescriptions we write require additional modifications by the pedorthotist or certified footwear provider as the patient begins to use the footwear.

Third, there may be delays in patients' appreciation of new foot and ankle problems with their new footwear due to sensory neuropathy. Fourth, patients with risk factors for developing foot and ankle wounds often have ongoing, progressively worsening deformities, peripheral artery disease and neuropathy. The changes associated with these may require expedient revisions in footwear and/or surgical interventions.

Listen to the patients, and hear what they like about their old shoes and what they do not like about their new protective footwear. Then pair this information with the science that is needed to meet their prescription footwear needs. As stated previously, protective footwear is the second line of defense (after skin and toenail care) for preventing problems in patients with risk factors for foot and ankle wound formation. If protective footwear is appropriately prescribed and the patient is instructed in the philosophy behind the quotation “If the shoe fits, don't always wear it,” new wound problems

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can usually be prevented. When protective footwear cannot accomplish these goals, then surgery, the first line of offense, may be required.

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