STATE OF WISCONSIN
Department of Safety and Professional Services
1400 E Washington Ave.
Madison WI 53703

Mail to:
PO Box 8935
Madison WI 53708-8935

Email: dsps@wisconsin.gov
Web: http://dsps.wi.gov
Phone: 608-266-2112

Governor Scott Walker **Secretary Dave Ross**

PODIATRY AFFILIATED CREDENTIALING BOARD
Room 121C, 1400 E. Washington Avenue, Madison
Contact: Tom Ryan (608) 266-2112
October 24, 2013

The following agenda describes the issues that the Board plans to consider at the meeting. At the time of the meeting, items may be removed from the agenda. Please consult the meeting minutes for a description of the actions of the Board.

AGENDA

9:00 A.M.

OPEN SESSION – CALL TO ORDER – ROLL CALL

A. Recognition of Board Member(s)

B. Introduction of New Board Member(s)

C. Adoption of Agenda (1-4)

D. Approval of Minutes – August 23, 2013 (5-6)

E. Administrative Updates
1) Staff Updates
   a) Introduction of Division Administrator Greg Gasper
   b) Introduction of Executive Director Greg DiMiceli
2) Survey on Potential Agency Merger **(7-8)**
3) Other

F. APPEARANCE – Katie Koschnick, DLSC Division Administrator – Review and Discussion of the DSPS Economic Impact Report (9-38)

G. Credentialing Matters

H. DLSC Matters

I. Education and Examination Matters

J. Legislative/Administrative Rule Matters:
1) Scope Statement on s. POD 3.01 and POD 3.04 Relating to Continuing Education Audit – Board Review and Approval **(39-42)**

2) POD 3.01, 4.01 and 4.03(2) and s. 440.08(2)(a)60 and 448.665 Stats., For the Purpose of Determining the Biennial Registration Date – Board Review and Discussion **(43-48)**
3) CR 12-047 POD 1.08(5) Relating to Temporary Educational License and Continuing Education – Board Discussion and Approval **(49-56)**
4) Medical Examining Board's Recommendation on s 165-POD 1.02, 7 – Podiatric X-Ray Assistants – Board Discussion **(57-58)**
5) ASRT Radiography Curriculum – Board Review **(59-192)**
6) POD 1.01 X-Ray by Unlicensed Personnel – Board Review and Approval **(193-198)**

K. Correspondence from Jason Beaudreau and Response from Dr. Weis – Board Discussion (199-222)

L. Article by Carl Ameringer, PhD, JD, *State Medical Boards and the Problem of Unnecessary Care and Treatment* – Board Discussion (223-232)

M. Practice Matters

N. Informational Items

O. Items Added After Preparation of Agenda:
1) Introductions, Announcements and Recognition
2) Presentations of Petition(s) for Summary Suspension
3) Presentation of Proposed Stipulation(s), Final Decision(s) and Order(s)
4) Presentation of Final Decisions
5) Disciplinary Matters
6) Executive Director Matters
7) Education and Examination Matters
8) Credentialing Matters
9) Class 1 Hearing(s)
10) Practice Matters
11) Legislation/Administrative Rule Matters
12) Liaison Report(s)
13) Informational Item(s)
14) Speaking Engagement(s), Travel, or Public Relation Request(s)

P. Public Comments

CONVENE TO CLOSED SESSION to deliberate on cases following hearing (s. 19.85(1)(a), Stats.; consider closing disciplinary investigation with administrative warning (s. 19.85(1)(b), Stats. and 440.205, Stats., to consider individual histories or disciplinary data (s. 19.85 (1)(f), Stats.; and, to confer with legal counsel (s. 19.85(1)(g), Stats.)

Q. Presentation and Deliberation on Proposed Stipulations, Final Decisions and Orders by the Division of Legal Services and Compliance (DLSC):

R. DLSC Matters:
1) Case Status Report **(233-234)**
2) Case Closing(s)

S. Deliberation of Items Received After Preparation of the Agenda
1) Disciplinary Matters
2) Education and Examination Matters
3) Credentialing Matters

4) Class 1 Hearings
5) Monitoring Matters
6) Professional Assistance Procedure (PAP) Matters
7) Petition(s) for Summary Suspensions
8) Petition(s) for Extension of Time
9) Proposed Stipulations, Final Decisions and Orders
10) Administrative Warnings
11) Proposed Decisions
12) Matters Relating to Costs
13) Motions
14) Petitions for Rehearing
15) Formal Complaints
16) Case Closings
17) Appearances from Requests Received or Renewed

T. Consulting with Legal Counsel

RECONVENE TO OPEN SESSION IMMEDIATELY FOLLOWING CLOSED SESSION

U. Vote on Items Considered or Deliberated Upon in Closed Session, if Voting is Appropriate

ADJOURNMENT

Page intentionally left blank

PODIATRY AFFILIATED CREDENTIALING BOARD
AUGUST 23, 2013
VIRTUAL MEETING MINUTES

PRESENT: Gary Brown (connected at 12:27 p.m.); Jeffery Giesking, DPM; Thomas Komp, DPM; William Weis, DPM

STAFF: Tom Ryan, Executive Director; Karen Rude-Evans, Bureau Assistant

CALL TO ORDER

William Weis, Chair, called the meeting to order at 12:00 p.m. A quorum of three (3) members was confirmed.

ADOPTION OF AGENDA

MOTION: Thomas Komp moved, seconded by Jeffery Giesking, to adopt the agenda as published. Motion carried unanimously.

APPROVAL OF MINUTES OF JULY 30, 2013

MOTION: Jeffery Giesking moved, seconded by Thomas Komp, to approve the minutes of July 30, 2013 as written. Motion carried unanimously.

DLSC MATTERS

Presentation of Proposed Stipulation, Final Decision and Order

DLSC Attorney Arthur Thexton presented the Proposed Stipulation, Final Decision and Order in the disciplinary proceedings against John. S. Lanham, DPM, 12 POD 002 et. al. This matter will be deliberated in closed session.

CLOSED SESSION

Chair William Weis read the motion to convene to closed session.

MOTION: William Weis moved, seconded by Jeffery Giesking, to convene to closed session to deliberate on cases following hearing (Wis. Stat. § 19.85 (1) (a)); consider closing disciplinary investigation with administrative warning (Wis. Stat.§ 19.85 (1) (b), and Wis. Stat. § 440.205); consider

individual histories or disciplinary data (Wis. Stat. § 19.85 (1) (f)); and to confer with legal counsel (Wis. Stat. § 19.85 (1) (g)) Roll call vote: Jeffery Giesking-yes; Thomas Komp-yes; William Weis-yes. Motion carried unanimously.

Open session recessed at 12:14 p.m.

RECONVENE INTO OPEN SESSION IMMEDIATELY FOLLOWING CLOSED SESSION

MOTION: Jeffery Giesking moved, seconded by William Weis, to reconvene into open session. Motion carried unanimously.

The Board reconvened into open session at 12:37 p.m.

VOTING ON ITEMS CONSIDERED IN CLOSED SESSION

PROPOSED STIPULATION, FINAL DECISION AND ORDER

MOTION: William Weis moved, seconded by Thomas Komp, to adopt the Proposed Stipulation, Final Decision and Order in the disciplinary proceedings against **John S. Lanham, DPM**, case numbers 12 POD 002, 12 POD 006, 12 POD 009, 12 POD 013, 12 POD 014, 12 POD 016, 13 POD 004, 13 POD 005, 13 POD 007 and 13 POD 008. Motion carried unanimously.

REAFFIRM MOTIONS MADE IN CLOSED SESSION

MOTION: William Weis moved, seconded by Jeffery Giesking, to reaffirm all votes made in closed session. Motion carried unanimously.

DELEGATION OF SIGNATURE AUTHORITY

MOTION: Thomas Komp moved, seconded by Jeffery Giesking, to delegate signature authority to Executive Director Tom Ryan for the Lanham matter. Motion carried unanimously.

ADJOURNMENT

MOTION: William Weis moved, seconded by Jeffery Giesking, to adjourn the meeting. Motion carried unanimously.

The meeting adjourned at 12:40 p.m.

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Karen Rude-Evans, Bureau Assistant, On Behalf of Executive Director Tom Ryan	October 14, 2013 Items will be considered late if submitted after 4:30 p.m. on the deadline date: ▪ 8 business days before the meeting for paperless boards ▪ 14 business days before the meeting for all others

3) Name of Board, Committee, Council, Sections:

Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	Survey on Potential Agency Merger

7) Place Item in:	8) Is an appearance before the Board being scheduled?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes (Fill out Board Appearance Request) ☒ No	

10) Describe the issue and action that should be addressed:

Information regarding the online survey on the potential agency merger.

Take a Survey about Consolidating DATCP and DSPS

Provide your feedback about possibly merging the Department of Safety and Professional Services (DSPS) and the Department of Agriculture, Trade, and Consumer Protection (DATCP). Your input about how this consolidation may impact you is very valuable to us. Your answers and contact information will be kept confidential and will not be used outside the scope of this survey. All survey results will be tallied for any reporting purposes. Take the survey.

http://dsps.wi.gov/Default.aspx?Page=3581483f-205b-4728-a362-8ce70f3db174

11) Authorization

Karen Rude-Evans

Signature of person making this request — Date

Supervisor (if required) — Date

Executive Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Policy Development Executive Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

We are contacting you today as we would appreciate your feedback (including feedback from your organizations board and members) about possibly merging the Department of Safety and Professional Services (DSPS) and the Department of Agriculture, Trade and Consumer Protection (DATCP). Your input about how this consolidation may impact you is very valuable to us.

The 2013-15 state budget calls for a study about consolidating these two agencies. DSPS manages the licensing and regulation of professions in health, business and construction trades. They also oversee state building safety codes and provide services related to plan review, permit issuance, building and component inspection, and safety codes. DATCP is responsible for the promotion and regulation of Wisconsin's agriculture industry, including Agriculture Resource Management and Animal Health, as well as the oversight of food safety and consumer protection.

We ask that you complete the survey and forward this email to your members for their response so we can better understand how a potential consolidation may affect you. Your answers and contact information will be kept confidential and will not be used outside of the scope of this survey. All survey results will be tallied for any reporting purposes.

TAKE THE SURVEY – your answers will be kept confidential

Thank you in advance for your participation and input.
Office of Business Development

Note: throughout the survey, you will see the term 'license' which refers to any license, credential, certification, registration or permit. Please view the term to mean the document a state agency issues as a requirement to do business, perform an occupation or specific work activity in the State of Wisconsin.

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Karen Rude-Evans, Bureau Assistant, On Behalf of Executive Director Tom Ryan	10/4/2013 Items will be considered late if submitted after 4:30 p.m. on the deadline date: ▪ 8 business days before the meeting for paperless boards ▪ 14 business days before the meeting for all others

3) Name of Board, Committee, Council, Sections:

Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	APPEARANCE - Katie Koschnick - DSPS Economic Impact Report

7) Place Item in:	8) Is an appearance before the Board being scheduled?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☒ Yes (Fill out Board Appearance Request) ☐ No	

10) Describe the issue and action that should be addressed:

Katie Koschnick, DLSC Division Administrator, will review and discuss the DSPS Economic Impact Report with the Board.

11) Authorization

Karen Rude-Evans

Signature of person making this request — Date

Supervisor (if required) — Date

Executive Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:

1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Policy Development Executive Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES

Recent Accomplishments and Economic Footprint Report

Regulating industries that contribute over $75 billion *annually to the Wisconsin economy*

September 2013

INTRODUCTION

The regulated professions and industries within the Department of Safety and Professional Services (DSPS) have a significant impact on the economy and the health, safety, and welfare of Wisconsin's residents. This report assesses the contribution of DSPS to Wisconsin's economy specifically focusing on the health care, construction, and real estate industries. Without the Department's regulatory oversight, proper functioning of these industries could not be maintained.

MISSION

The mission of the Department of Safety and Professional Services is to promote economic growth and stability while protecting the citizens of Wisconsin as designated by statute.

PURPOSE

- competent practice of licensed professionals
- safety of the construction and use of public and private buildings
- compliance with professional and industry standards

Highlights from this report include:

- Since its creation, DSPS has made great strides to increase responsiveness, drive productivity, and reduce operational costs to meet the increasing demands of its customers while making efficient use of valuable taxpayer dollars.
- Earning $18 billion annually on average, health and business professionals credentialed by DSPS are a vital component to economic growth in Wisconsin.
- In 2009, health care professionals credentialed by DSPS generated $40 billion in economic activity, almost 17% of Wisconsin's gross state product.
- With DSPS regulatory oversight, the construction sector safely and competently contributed approximately $6.9 billion to Wisconsin real gross domestic product (GDP) in 2012.
- With DSPS regulatory oversight, the construction sector provided over 152,000 well-paying jobs to Wisconsin workers in 2011.
- Construction projects regulated by DSPS can be effective economic stimuli that create jobs and increase spending in a wide range of other sectors of the economy.
- With DSPS regulatory oversight, the real estate industry accounted for $28.2 billion or 12.5% of Wisconsin GDP in 2012
- When a real estate professional credentialed by DSPS sells a home in Wisconsin, it generates over $13,000 in income from real estate related industries; over $5,000 in additional expenditures on consumer items such as furniture, appliances, and paint services; and over $3,000 in expenditures on remodeling within two years of the home purchase.

The contribution this Department makes to Wisconsin's economy far exceeds these numbers alone, as every day over 380,000 credential holders go to work in a DSPS regulated industry.[1]

This report contains four parts. The first section provides a general overview of the Department's roles and responsibilities and describes recent process improvements for greater Departmental productivity. The second section assesses the economic contribution of DSPS through the regulation of the health care industry. The third section examines the impact of DSPS on the Wisconsin economy through the regulation of the construction industry. The fourth section evaluates the economic impact of DSPS through the regulation of the real estate industry.

[1] For a complete list of DSPS regulated industries please visit: http://dsps.wi.gov/Licenses-Permits/Credentialing.

GENERAL RESPONSIBILITIES AND RECENT ACCOMPLISHMENTS

DSPS protects the citizens of Wisconsin by ensuring safe and competent practice of licensed professionals and safe and sanitary conditions in public and private buildings. Divisions within DSPS perform a variety of tasks to successfully accomplish this mission.[2]

DSPS protects the citizens of Wisconsin by ensuring safe and competent practice of licensed professionals and safe and sanitary conditions in public and private buildings.

DIVISION RESPONSIBILITIES

The Division of Policy Development (DPD) provides administrative support and policy guidance to the professional boards in the state by facilitating board meetings, serving as a liaison between the boards and the Department, and managing the administrative rule promulgation process for self-regulated professions. DPD also manages the administrative rule promulgation process for professions that are directly regulated by the Department. *In 2012, DPD provided administrative services to over 40 boards and councils and facilitated approximately 180 meetings related to board activities.*

The Division of Professional Credential Processing (DPCP) processes all credential applications and oversees credential eligibility, renewal, continuing education requirements, and examination requirements for regulated professions. *Between June of 2011 and June of 2013, DPCP processed roughly 72,000 initial credentials and 212,000 renewals. As of June, 2013, there were over 388,000 active credential holders.*

The Division of Legal Services and Compliance (DLSC) provides legal services to professional boards and the department regarding the investigation and discipline of licensed credential holders for violations of professional regulations. The Division is also responsible for the complaint intake process, monitoring compliance with disciplinary orders, managing a confidential program for impaired professionals, performing audits of trust accounts, and conducting business inspections for pharmacies, drug distributors and manufacturers, funeral establishments, and barber and cosmetology schools and establishments.

The Division of Industry Services (DIS) contains multiple bureaus. The Bureau of Field Services provides services related to construction and operation of buildings, along with ensuring compliance with health and safety codes. The Bureau of Technical Services (BTS) provides services such as plan review, consultation, inspections, and product evaluation. *In 2012, BTS staff completed over 14,000 plan reviews and 100,000 inspections.* The Division also administers the Wisconsin Two-Percent Fire

[2] To achieve greater efficiencies, the DSPS recently recommended the transfer of responsibilities related to petroleum products and storage tank systems. The enactment of 2013 Wisconsin Act 20 transferred these responsibilities to the WI Department of Natural Resources and WI Department of Agriculture, Trade and Consumer Protection.

Dues Payments Program. Funded by fire insurance premiums paid in Wisconsin, DIS distributes payments to municipalities to be used to purchase fire protection equipment, fund fire prevention inspection and public fire education, train fire fighters and fire inspectors, or fund pension or other special funds for disabled or superannuated fire fighters. *In 2013, DIS distributed approximately $15.9 million to Wisconsin municipalities through the Two-Percent Fire Dues Payments Program.*[3]

RECENT ACCOMPLISHMENTS

Since its creation, DSPS has made great strides to increase responsiveness, drive productivity, and reduce operational costs to meet the increasing demands of its customers while making efficient use of valuable taxpayer dollars.

Since its creation, DSPS has made great strides to increase responsiveness, drive productivity, and reduce operational costs in order to meet the increasing demands of its customers while making efficient use of valuable taxpayer dollars.

Reducing Prescription Drug Abuse

DPD recently implemented the Wisconsin Prescription Drug Monitoring Program (PDMP). *As a HIPAA*[4]*-compliant database, the Wisconsin PDMP stores data about controlled substances and other highly abused substances prescribed to individuals in Wisconsin and lawfully discloses the data to authorized individuals.* Pharmacies and other dispensers of prescription drugs collect and submit data to the PDMP database including information about the prescriber, the dispenser, the drug, and the patient for each prescription. Authorized users may obtain data stored in the PDMP database to verify prescription information. PDMP helps to improve patient care and safety, reduce the abuse and diversion of prescription drugs in Wisconsin, and ensure that patients with a legitimate medical need for the prescription medications are not adversely affected.

Effective June 1, 2010, 2009 Wisconsin Act 362 directed DSPS to manage the operations of PDMP in accordance with the rules and policies developed by the Pharmacy Examining Board. In September of 2011, DSPS received grant funding to manage PDMP. The Pharmacy Examining Board began the administrative rule-writing process on October 1, 2011 and the rules, ch. Phar 18, became effective on January 1, 2013. Since this date, DSPS staff members have travelled the state educating the public through outreach and training events.

[3] The Department also contains a Division of Management Services. The Division of Management Services provides administrative services to the Office of the Secretary and all other Divisions within the Department. These services include human resources, payroll, planning, budget, accounting, and information technology.

[4] Health Insurance Portability and Accountability Act is a Federal legislation designed to improve the portability and continuity of health insurance. Another important objective is to reduce administrative costs for providers and payers while protecting the privacy of health information.

The Wisconsin PDMP became fully operational on June 1, 2013. The Department established memoranda of understanding (MOUs) with sovereign tribes and the Indian Health Services (HIS) to participate in PDMP and participated in several Alcohol and Other Drug Abuse prevention events. PDMP staff continues to strengthen state tribal collaboration through outreach to the Great Lakes Inter-Tribal Council, Inc., tribal leaders, tribal health directors, and tribal law enforcement. *Currently the PDMP database stores approximately 6 million prescription records, 1,800 dispensers submit data, and 3,200 users have query accounts.* DSPS staff seek to further enhance the PDMP database by working to improve processes to allow access to data and exchange data with neighboring states.

The Prescription Drug Monitoring Program will reduce the abuse and diversion of prescription drugs in Wisconsin.

Issuing Licenses More Quickly

DPCP recently developed and piloted the Online License Application System (OLAS) that allows individuals to apply and pay fees for professional credentials online. This system will significantly decrease the turnaround time for applicants to receive their professional credential and begin working in Wisconsin.

OLAS for nursing licenses piloted in spring of 2013 to reduce the processing time of nursing applications and provide schools with an efficient paperless process to approve and submit graduation information to DSPS. A sample of 10 percent showed that DSPS granted OLAS applicants permission to take the required National Council Licensure Examination (NCLEX) one to two business days after the receipt of the OLAS application from the school and *granted OLAS applicants a license one to two business days* after receipt of NCLEX exam results. This processing time is a significant improvement over applications sent by postal mail. Using the paper method it took one to five business days for the application to reach credentialing staff from the mail room and another 17 business days (on average, while waiting for additional paperwork) before DSPS granted permission to take the NCLEX exam. Since the implementation of Nursing OLAS, the processing time between receipt of an application and NCLEX authorization has decreased by 90 percent on average. DPCP is working to expand OLAS to several other professions.

Since the implementation of Nursing OLAS, the processing time between receipt of an application and NCLEX authorization has decreased by 90 percent on average.

DPCP has similarly encouraged applicants to renew their credentials online via the website. *As a result, the percent of online renewals increased from 84% in 2011 to 95% in 2012*. The Division also implemented a live call center that allows customers and the general public to contact the Department via telephone and speak with a live representative to address their immediate concerns.

Creating Efficiencies

In June of 2012, DSPS commenced a paperless office initiative to promote operational effectiveness, a more productive use of space, and simplified processes. DPD began providing electronic board agendas and laptops to board members in place of paper agendas for an *estimated annual savings of $21,000*. Further, this initiative also allowed for the elimination of 214 file cabinets, 18 bookcases, and 144 feet of open shelving giving the Department the ability to add workstations to its flagship location at 1400 East Washington Avenue. Efforts like this allowed for the Madison-based staff of the Division of Industry Services (DIS) to completely vacate its space at the former Department of Commerce building and move to the East Washington location, *saving the Department roughly $65,000* ***each month***.

Industry Services implemented several additional initiatives to increase staff productivity and improve customer satisfaction. First, in the interest of delivering consistent performance and code enforcement, DIS has made great strides at standardizing the inspection process and report format across all division programs. Process improvements include using technology tools to assist field team members in report preparation and submission.

DIS recently implemented electronic plan review saving the Department and its customers valuable time and money. Historically, individuals have submitted paper plans to various locations in the state. Occasionally, specific locations would experience a high volume of plan submittals resulting in increased turnaround time. *Electronic plan review provides for greater organizational flexibility by allowing reviewers all over Wisconsin to share the workload which expedites the plan review process.*

In order to further expedite processes for customers, DIS staff are developing electronic forms for all applications, registrations, and permits that will allow customers to complete the paperwork online. The Division is similarly developing the database management required to electronically process these applications.

Clearing the Red Tape

In compliance with 2012 Executive Order 61, DPD and the professional boards supported by the Division identified and changed administrative rules that hindered job creation and small business growth; such as,

- A less burdensome pathway to licensure for barbers
- A more convenient online open book exam option for funeral directors
- Deletion of a requirement that certain municipalities hire two full-time plumbing inspectors

Boards supported by the division initiated the administrative rule writing process for a number of additional changes as a result of 2012 Executive Order 61, for example:

The Division of Policy Development and the professional boards managed by the Division identified and changed administrative rules that hindered job creation and small business growth including implementing a less burdensome path to licensure for barbers.

- The Optometry Examining Board seeks to allow electronic signatures for prescription eyeglasses, which will allow thousands of optometry patients to enjoy the increased speed and accuracy of electronic prescription eyeglasses.
- The Real Estate Examining Board plans to provide brokers the ability to retain records in electronic format and recognizing the ledger and journaling software widely utilized in the real estate industry.
- The Dentistry Examining Board seeks to reduce unnecessary regulatory burdens on dentistry professionals by eliminating nonessential paperwork associated with the training of unlicensed persons, modernizing rules to allow for electronic authorization of dental laboratory work, and developing guidelines for patient dental record retention removing significant paper storage costs.

DPD has worked to *create predictability* in the enforcement of administrative rules by updating forms to better align with statutory requirements and codifying internal policy procedures; this gives members of the public *clear expectations* of what they can expect when they walk through the doors of our agency. The Division has also greatly *increased transparency* in the rule writing process by using the website to notice public comment periods on all rule projects.

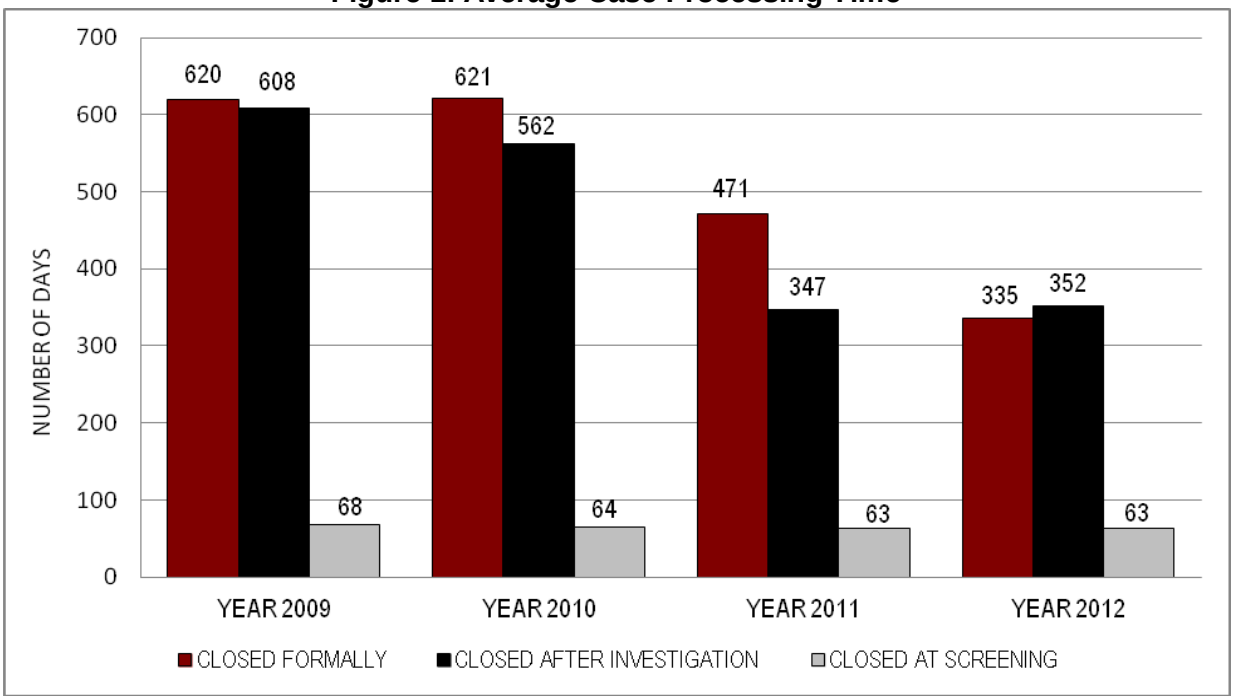
Saving Taxpayer Dollars

Shortly after the establishment of DSPS, Department management and staff analyzed agency expenditures and found several opportunities for cost savings. For example, it was discovered that the agency continued to pay for landlines and voicemail boxes that once belonged to former employees. *As of April 2012, the Department eliminated 152 landlines and 54 voicemail boxes for a combined annual base savings of approximately $22,000.* Several additional disconnections have occurred since that date resulting in even greater cost savings.

Protecting the Public

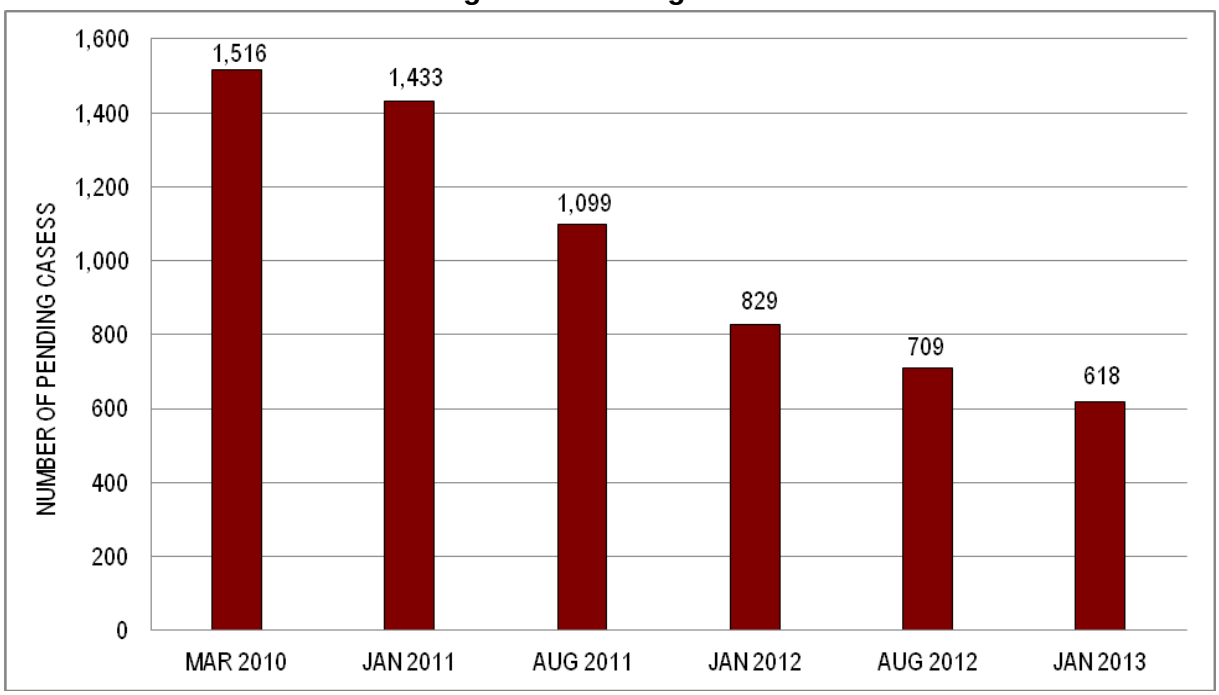
In 2011, under Governor Walker's administration, an increased focus was placed on timely enforcement and resolution of cases. This insured prompt protection of the public without comprising adequacy and appropriateness of enforcement actions. DLSC case processing time has improved significantly from 2009. *The average number of days to process improved as follows: closed formals from 620 days in 2009 down to 335 days in 2012; closed after investigation from 608 days down to 352 days, and closed at screening from 68 days in 2009 down to 63 days in 2012.* (See Figure 1)

Figure 1: Average Case Processing Time



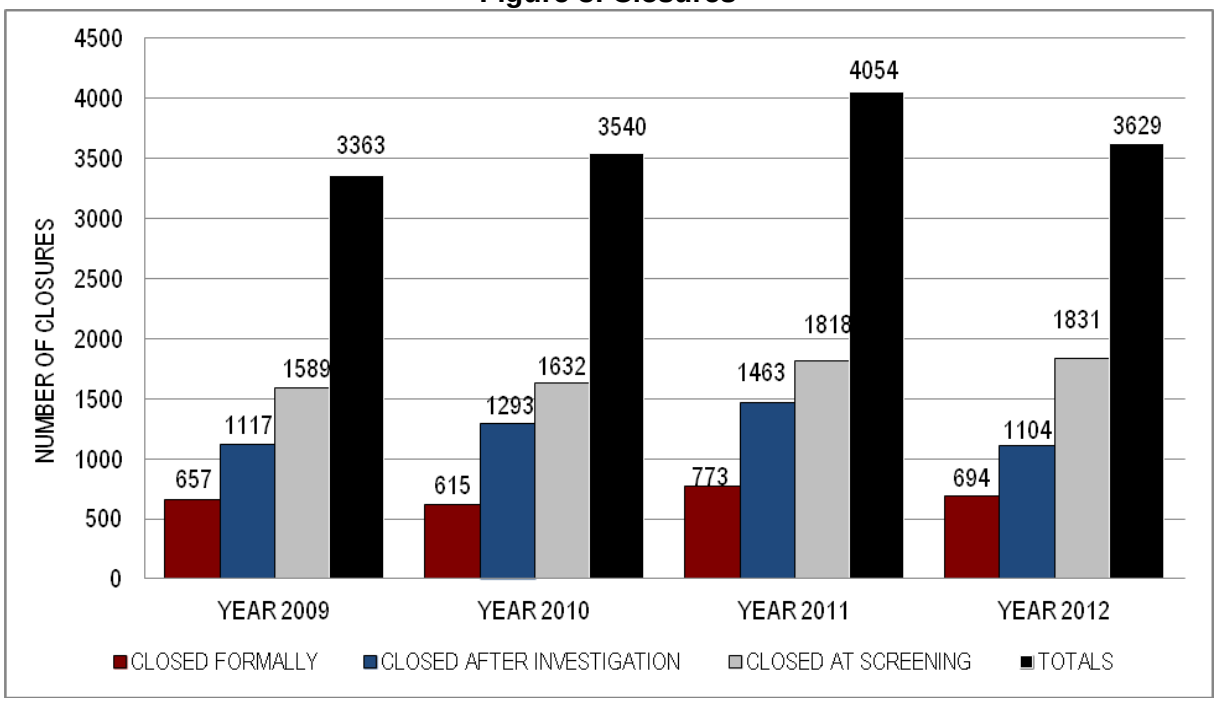
Through effective management and increased operational efficiency, DLSC has reduced its pending caseload from 1,516 to 618 cases (Figure 2).

Figure 2: Pending Cases



As shown in the chart below, protection of the public has been a top priority in DLSC, as the number of enforcement actions has increased in the past 2 years (Figure 3).

Figure 3: Closures



In addition to the case closures mentioned in the charts above, in 2012 DLSC completed 206 audits, 153 inspections, had 69 participants enrolled in a confidential assistance program for chemically impaired professionals, and monitored approximately 1,890 professional credential holders for compliance with disciplinary orders. However, numbers alone don't tell the whole story. The Division continuously looks for ways of ensuring that cases are handled in the best manner possible through precise attention to detail, intense legal scrutiny, and high quality customer service. For example, the division recently created online tutorials to explain the legal process to professional board members who serve as case advisors on disciplinary actions. These tutorials can be accessed by board members from the board room, work, or home 24 hours a day, 7 days a week on any computer. This is just one of the many ways DLSC delivers first rate service to the citizens of Wisconsin.

HEALTH AND BUSINESS REGULATION

Occupational regulation in Wisconsin began in 1882 with the creation of the Pharmacy Examining Board. This board set the credential requirements for pharmacists, granted credentials, promulgated administrative rules applicable to pharmacists, and collected credential fees. Between 1882 and 1965, 16 additional independent examining boards or councils were created that had separate budgets and directly employed staff (Austin 2013).

Earning $18 billion annually on average, health and business professionals credentialed by DSPS are a vital component to economic growth in Wisconsin.

Several extensive reorganizations of Wisconsin state government in the mid-1960s sought to improve operational efficiency and responsiveness to the public. A substantial reorganization of the executive branch resulted from the Kellett Commission, named after its chair, William R. Kellett. Many of the Kellett Commission's proposals impacted occupational licensure in Wisconsin, including the creation of a single Department of Regulation and Licensing (DRL) to provide centralized administrative services to the existing independent examining boards and councils. Under the consolidated administrative structure, each board maintained the independent regulation of its own profession, and the Department took on the direct regulation of specific professions where no examining board existed. These recommendations became law in 1967 (Chapter 75, Laws of 1967; Austin 2013).

Subsequent legislation further consolidated occupational regulation under DRL and shifted most administrative responsibilities from the independent boards to the Department (Austin 2013):

1975	• The regulation of barbering and the regulation of the funeral industry transferred to DRL from the Department of Health and Social Services • DRL authorized to hire staff for all the boards with a few exceptions
1977	• Single appropriation created for the expenditure of all license fee revenue and budgetary authority centralized under DRL
1979	• DRL authorized to reorganize staff along functional lines rather than by the boards they served and to eliminate the last employee positions remaining under the boards' direct authority • Legislation eliminated the Watchmaking Examining Board and Athletic Examining Board
2009	• Second appropriation created to split the budget and staffing of the professions regulated by the Medical Examining Board and affiliated credentialing boards from the remaining DRL professions

In 2011, the Department of Safety and Professional Services was created and assumed all responsibilities performed by the former DRL and certain functions performed by the former Department of Commerce (2011 Wisconsin Act 32; Austin 2013).

In June of 2013, over 300,000 health and business professionals credentialed by DSPS worked in the state of Wisconsin earning *$18 billion dollars annually on average*.[5] These professionals contribute to economic growth in Wisconsin by spending their earnings at Wisconsin businesses, providing in-state capital for business investment and job creation, and supporting state and local governments through the payment of a variety of taxes.

[5] Annual average earnings for professions with many subcategories such as Professional Engineering were calculated by taking an average of the subcategories. Annual average earnings for professionals "in-training" were calculated by dividing the annual average earning for a fully credentialed professional by two. The total annual earnings for all credential holders in each profession were estimated by multiplying the number of active licenses in each profession by the most recent estimates of average annual earnings for professions in Wisconsin as provided in the Occupational and Employment Statistics (Wisconsin Department of Workforce Development 2012*).*

HEALTH CARE INDUSTRY

The Centers for Medicare and Medicaid Services (CMS), a federal agency within the United States Department of Health and Human Services (DHHS), estimates that *roughly $40 billion*[6] *were spent on health care services in Wisconsin in 2009* (Centers for Medicare and Medicaid Services 2011).[7] Professionals credentialed by DSPS account for the vast majority of health spending in Wisconsin. DSPS ensures the safe and competent practice of 62 different health professions. Appendix A provides a complete list of health-related professions and boards under the purview of DSPS.

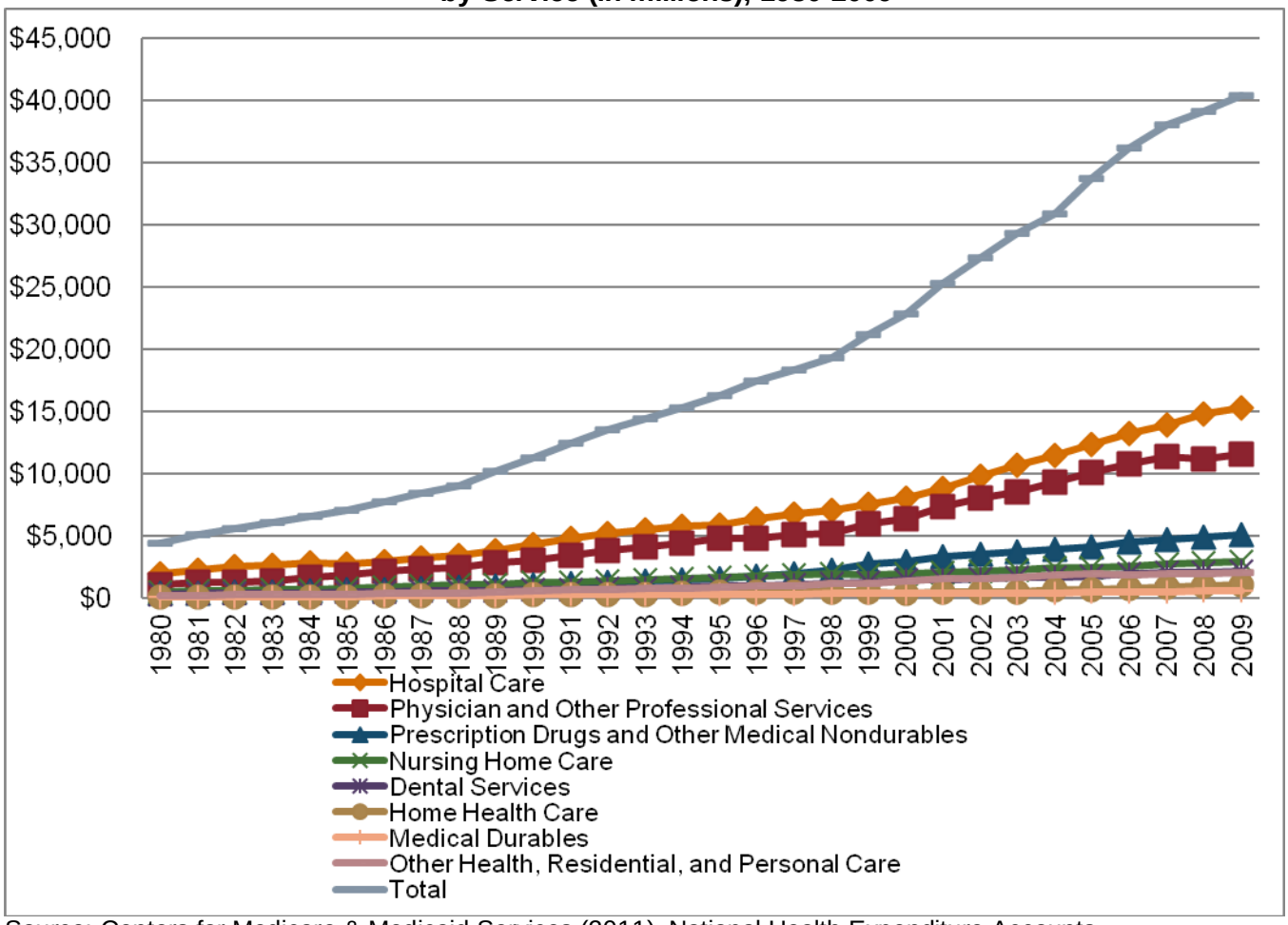
In 2009, health care professionals credentialed by DSPS generated $40 billion in economic activity, almost 17% of state gross domestic product.

Between June of 2011 and June of 2013, the Department processed approximately 34,000 initial credentials and over 57,000 renewals for health care professionals. As of June 2013, there were over 197,000 active Wisconsin credential holders in health care professions. In 2012, DSPS provided administrative services to 27 health-related boards and councils and facilitated approximately 115 meetings for health-related board activities.

[6] The data used in this report are state-of-provider estimates which reflect spending for services delivered in each state to residents and nonresidents. These estimates are useful in measuring the role of health spending in a state's economy.
[7] Health care spending data produced by the National Health Expenditure Accounts (NHEA) of the Department of Health and Human Services Center for Medicare and Medicaid Services are larger than those produced by Bureau of Labor Statistics Consumer Expenditure Survey (CE); however, both are valid and widely utilized estimates of health care expenditures. Differences in definitions, sources, and methods are responsible for differences in the estimates. See http://www.bls.gov/cex/nhe_compare_200710.pdf for more a more detailed explanation.

Figure 4 shows the composition of total health care expenditures by service category in Wisconsin. The economic activity of each service category is either directly or indirectly generated by health care professionals credentialed by DSPS. Appendix C details the service categories and DSPS involvement in each category.

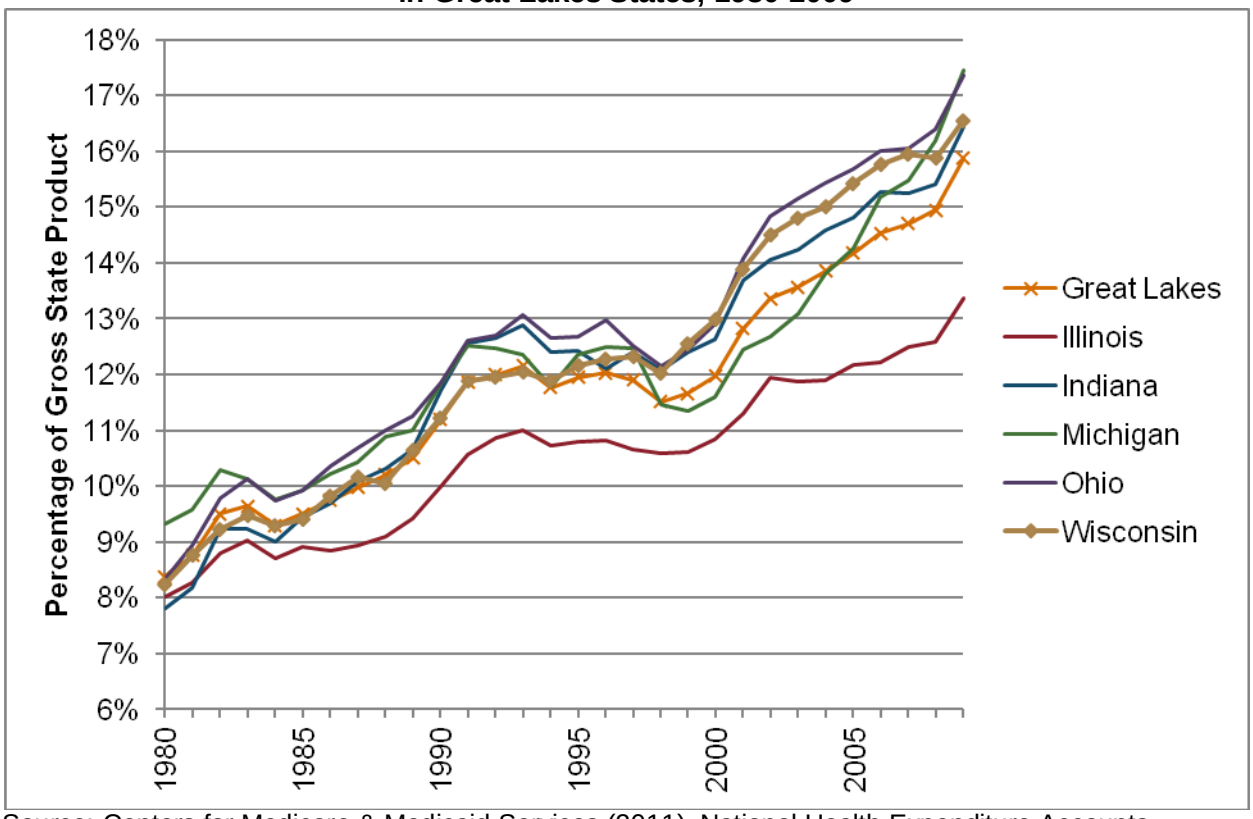
Figure 4: Health Care Spending in Wisconsin by Service (in millions), 1980-2009



Source: Centers for Medicare & Medicaid Services (2011), National Health Expenditure Accounts

Over the past 30 years, the health care industry has comprised a growing share of the state's gross domestic product (GDP). As shown in Figure 5, between 1980 and 1991, expenditures generated by health care professionals grew from 8.2% to 12.1% of the GDP and remained at this level for roughly eight years. Health care expenditures in Wisconsin grew from 12.1% of state GDP in 1999 to 17% in 2009.

Figure 5: Health Care Expenditures as a Percentage of State Gross Domestic Product in Great Lakes States, 1980-2009



Source: Centers for Medicare & Medicaid Services (2011), National Health Expenditure Accounts

Also shown in Figure 5, Wisconsin's neighboring states have experienced similar growth in health care industry expenditures (Centers for Medicare and Medicaid Services 2011). *If these trends continue, DSPS will play even more vital of a role in the state's economy as these health care professionals continue generating considerable economic activity.*

CONSTRUCTION SECTOR

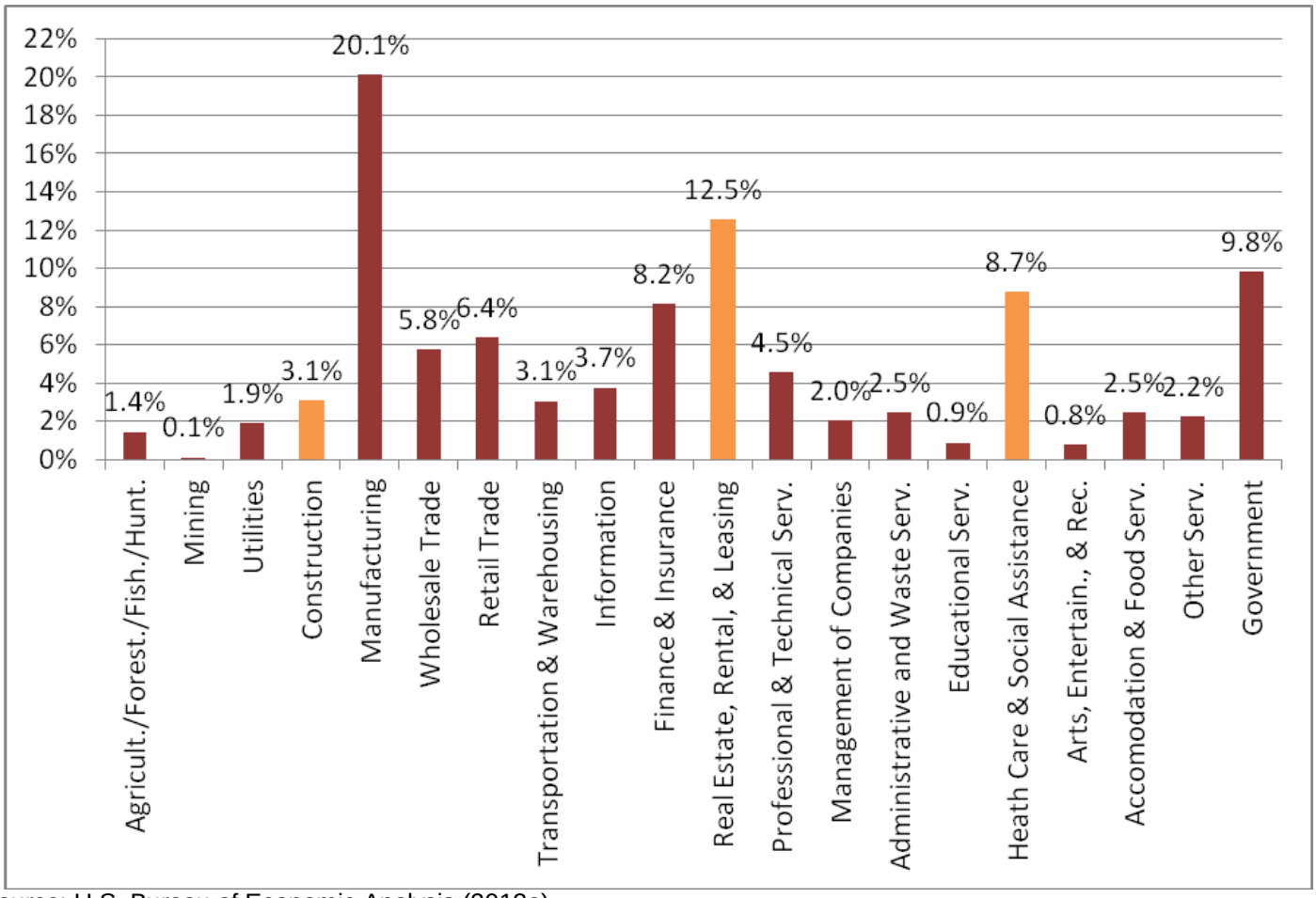
Between June of 2011 and June of 2013, the Department processed approximately 34,000 initial credentials and over 57,000 renewals for construction sector professionals. As of June 2013, there were *over 83,000 active DSPS credential holders in construction sector professions.* In 2012, Bureau of Technical Services staff completed *over 14,000 plan reviews and 100,000 inspections.* With DSPS regulatory oversight, the construction sector safely and competently contributed approximately $6.9 billion to Wisconsin real GDP in 2012 (U.S. Bureau of Economic Analysis 2013a).

With DSPS regulatory oversight, the construction sector safely and competently contributed approximately $6.9 billion to Wisconsin gross state product in 2012.

A handful of mid-sized industrial sectors, including construction, comprise the core of the Wisconsin economy. This is demonstrated using conventional measures of economic activity including output (gross domestic product) and employment. The U.S. Bureau of Economic Analysis (BEA) publishes annual estimates of Real Gross Domestic Product (RGDP) by state and provides estimates of shares of Wisconsin RGDP produced by each major industrial sector.

As shown in Figure 6, compared to the other major industrial sectors, construction is a moderate contributor to Wisconsin GDP. In 2012, the construction sector directly produced approximately $6.9 billion or 3.1% of Wisconsin RGDP (U.S. Bureau of Economic Analysis 2013a).

Figure 6: Sectoral Shares of 2012 Wisconsin Real GDP[8]



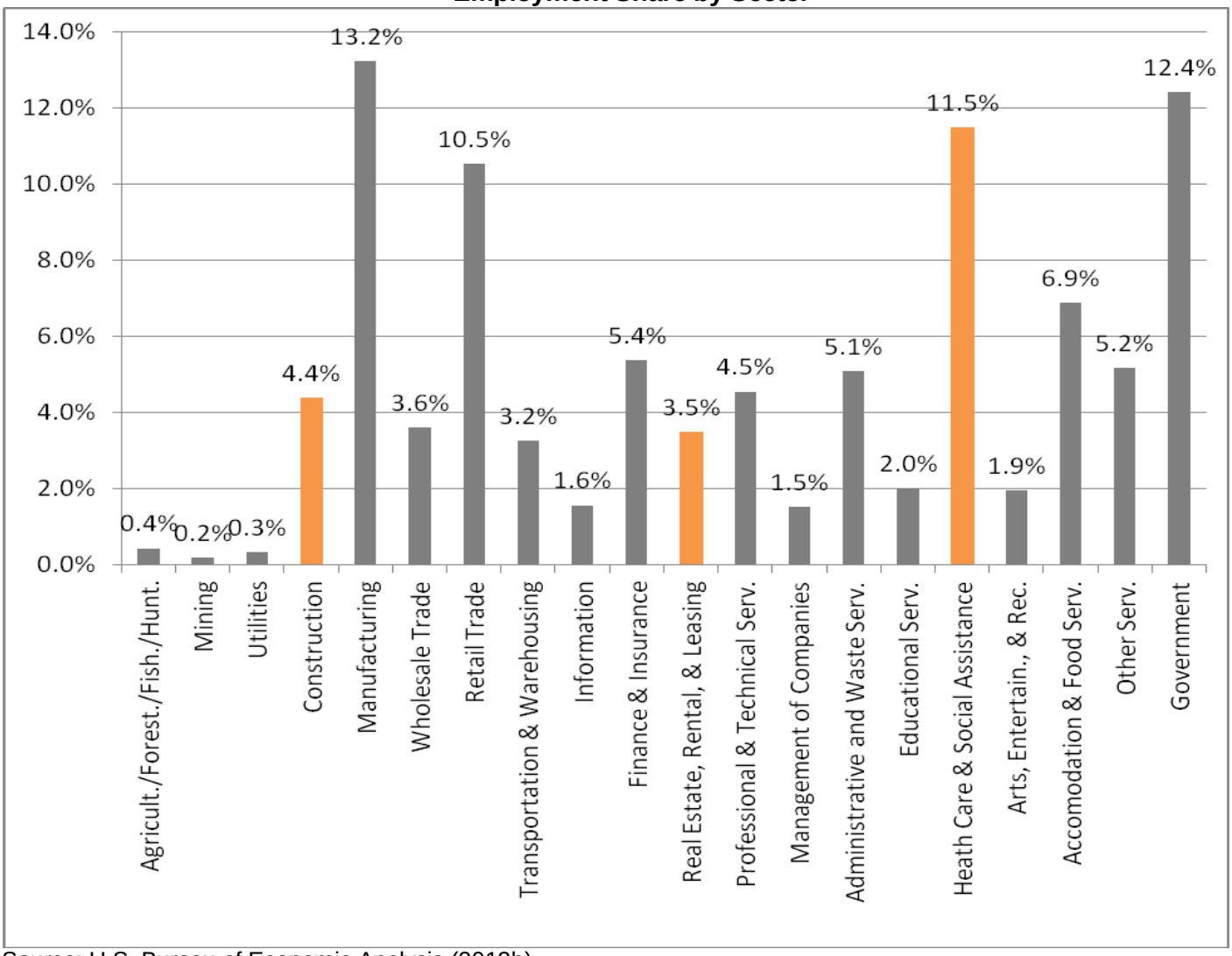
Source: U.S. Bureau of Economic Analysis (2013a)

[8] Health care spending data produced by the National Health Expenditure Accounts (NHEA) of the Department of Health and Human Services Center for Medicare and Medicaid Services (used in the previous section) are larger than those produced by Bureau of Labor Statistics Consumer Expenditure Survey (CE); however, both are valid and widely utilized estimates of health care expenditures. Differences in definitions, sources, and methods are responsible for differences in the estimates. See http://www.bls.gov/cex/nhe_compare_200710.pdf for more a more detailed explanation.

With DSPS regulatory oversight, the construction sector provided over 152,000 well-paying jobs to Wisconsin workers in 2011.

Construction is a mid-sized component of the overall Wisconsin labor market. The sector contained over 152,000 jobs in 2011 and accounted for 4.4% of the overall 2011 state employment as shown in Figure 7.

Figure 7: Wisconsin 2011 Employment Share by Sector

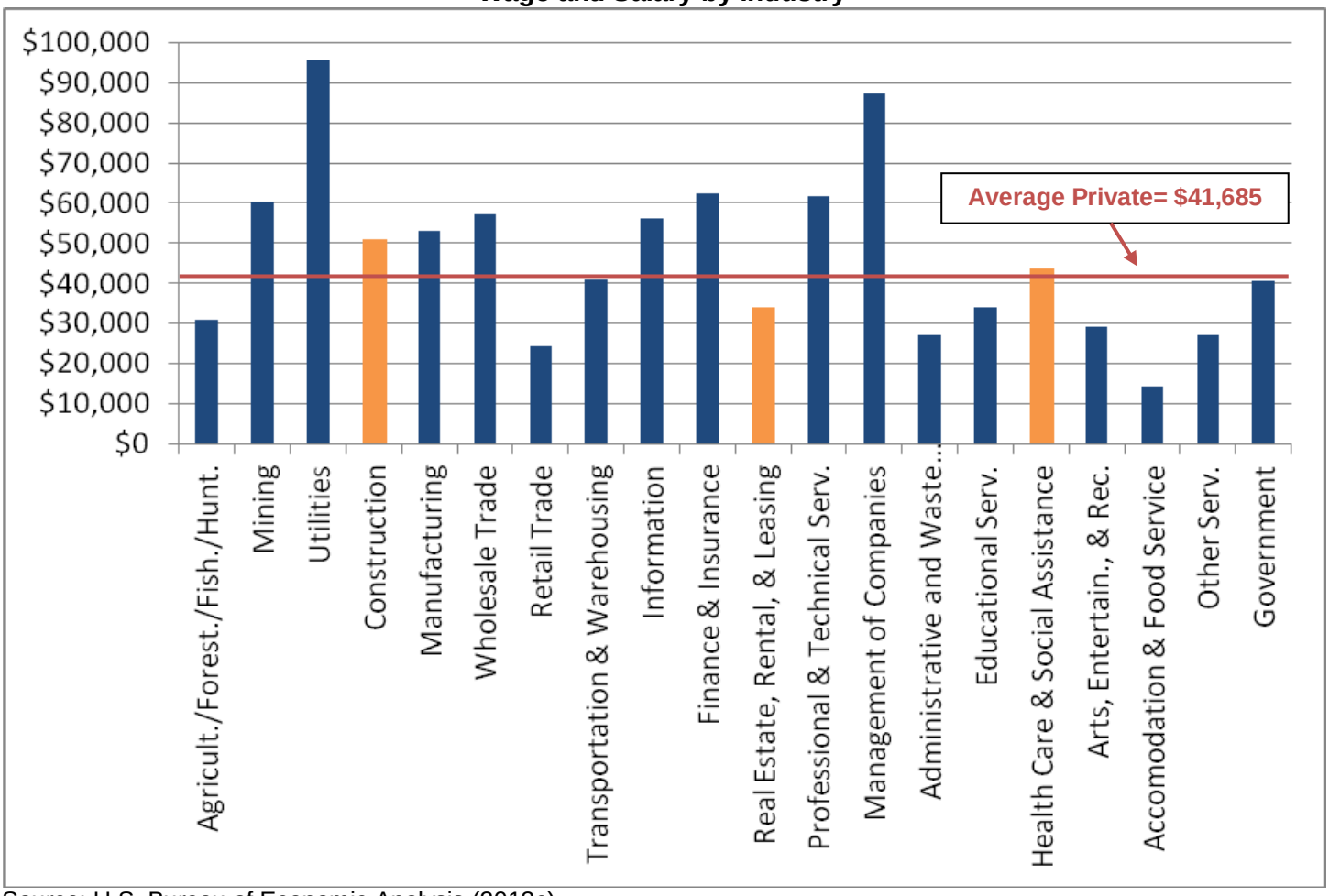


Source: U.S. Bureau of Economic Analysis (2013b)

Construction jobs tend to be relatively high skilled and high paying. Figure 8 provides the wage profile showing the average wage and salary income in Wisconsin for the year 2011 by major NAICS sector.[9] The construction sector had an annual average wage greater than 11 of the major NAICS sectors of roughly $51,000, almost $10,000 above the average.

.

Figure 8: 2011 Wisconsin Average Annual Wage and Salary by Industry



Source: U.S. Bureau of Economic Analysis (2013c)

In addition to being an important component of the Wisconsin economy, the construction sector plays a vital role in stimulating economic growth. Construction projects generate output, income, and employment within the construction sector and create "ripple effects" in a wide range of other sectors of the economy.

[9] The annual wage and salary income is calculated by dividing the Bureau of Economic Analysis total for wage and salary disbursements (Table SA07N) by wage and salary employment (Table SA27N).

In a report prepared for the Skill Integrity Responsibility Council, Inc., researchers estimated the total economic impact of two hypothetical construction projects: (1) A $10 million new building project, and (2) A $1 million remodeling project (Clark and Crane 2011).[10] Table 1 summarizes their findings.

Table 1: Total Economic Impact of Hypothetical Construction Projects

	Case Study 1:			Case Study 2:		
	$10 Million New Building Project			$1 Million Remodeling Project		
Industry	***Total Economic Impact***	***Total Job Increase***	***Total Tax Revenue Generated***	***Total Economic Impact***	***Total Job Increase***	***Total Tax Revenue Generated***
Construction Sector	$10.1 million	91	x	$1 million	10	x
All Other Sectors	$9.1 million	79	x	$0.92 million	8	x
Total	**$19.2 million**	**170**	**$853 thousand**	**$1.92 million**	**18**	**$91 thousand**

Source: Clark and Crane (2011)

As shown in Table 1, a $10 million new building project translates into $19.2 million in economic impact, 170 jobs (91 jobs in the construction sector and 79 jobs elsewhere in the economy), and $853 thousand in tax revenue. The total value added (after inputs are subtracted) from a $10 million new building project is *$10.3 million, with 75% of that coming from labor income*. Also shown in Table 1, a $1 million remodeling project for a nonresidential building translates into *$1.92 million in total economic impact, 18 jobs* (10 jobs in construction and 8 jobs elsewhere), and *$91 thousand in state and local tax revenues*. The total value added (after inputs are subtracted) from a $1 million dollar remodeling project is $1.1 million, with 73% of that coming from labor income (Clark and Crane 2011).[11] The findings of this report show that construction projects regulated by DSPS can be effective as short run economic stimuli. Furthermore, the resulting infrastructure leads to improved economic productivity in the long run.

Construction projects regulated by DSPS can be effective economic stimuli that create jobs and increase spending in a wide range of other sectors of the economy.

[10] Crane and Clark used the IMPLAN Input-Output or I-O modeling developed by the U.S. Department of Agriculture to measure the "ripple effects" that cause construction projects to have a greater impact on the state economy. This model has been widely tested and used for state and sub-state regional impact analysis.

[11] The model used to estimate these impacts assumes that no capacity constraints will prevent the economy from expanding to the full impact. In reality, very large construction projects can cause bottlenecks that may prevent the full scalable impact from being realized.

REAL ESTATE INDUSTRY

As of June 2013, over 21,000 real estate industry professionals credentialed by DSPS contributed to the Wisconsin economy. The Real Estate Examining Board and Real Estate Appraisers Board attached to DSPS regulate real estate brokers, real estate salespersons, timeshare salespersons, real estate business entities, licensed appraisers, certified residential appraisers, and certified general appraisers in Wisconsin. According to the United States Bureau of Economic Analysis estimates, the real estate industry accounted for *$28.2 billion or 12.5% of Wisconsin GDP in 2012* (as shown above in Figure 6). In 2011, the real estate industry comprised roughly 3.5% of overall 2011 state employment (as shown above in Figure 7).[12]

When a real estate professional credentialed by DSPS sells a home in Wisconsin, it generates over $13,000 in income from real estate related industries; over $5,000 in expenditures on consumer items; and over $3,000 in expenditures on remodeling.

When a real estate professional credentialed by DSPS sells a home in Wisconsin, it generates over $13,000 in income from real estate related industries; over $5,000 in additional expenditures on consumer items such as furniture, appliances, and paint services; and over $3,000 in expenditures on remodeling within two years of the home purchase. Aside from house-related expenditures, a new home sale results in greater spending at restaurants, sporting events, and charity events of approximately $11,000 on average (NAR Research 2013).

Wisconsin home sales jumped an astounding 11.4 percent in the first half of 2013 compared to 2012. Median house prices also increased to $140,000, a 7.7 percent increase from the first half of 2012 (Wisconsin REALTORS® Association). These trends indicate that DSPS will continue to play an essential role in Wisconsin's economy through its regulation of the real estate industry.

[12] Components of the BEA real estate industry estimates are not regulated by DSPS.

Appendix A: Health Care Professions and Boards under purview of DSPS

Health Care Professions

Acupuncturist
Advanced Practice Nurse Prescriber
Anesthesiologist Assistant
Art Therapist
Athletic Trainer
Audiologist
Behavior Analyst
Chiropractic Radiological Technician
Chiropractic Technician
Chiropractor
Clinical Substance Abuse Counselor
Clinical Supervisor In Training
Controlled Substances Special Use Authorization
Dance Therapist
Dental Hygienist
Dentist
Dietitian
Drug or Device Manufacturer
Hearing Instrument Specialist
Independent Clinical Supervisor
Intermediate Clinical Supervisor
Licensed Midwife
Licensed Practical Nurse
Licensed Radiographer
Limited X-Ray Machine Operator Permit
Marriage and Family Therapist
Massage Therapist or Bodywork Therapist
Music Therapist
Nurse-Midwife
Occupational Therapist
Occupational Therapy Assistant
Optometrist
Perfusionist
Pharmacist
Pharmacy (In State)
Pharmacy (Out of State)
Physical Therapist
Physical Therapist Assistant
Physician
Physician Assistant
Podiatrist
Prevention Specialist
Prevention Specialist in Training
Private Practice School Psychologist
Professional Counselor
Psychologist
Registered Nurse
Registered Sanitarian
Respiratory Care Practitioner
Sign Language Interpreter
Sign Language Interpreter (Restricted)
Social Worker
Social Worker- Advanced Practice
Social Worker- Independent
Social Worker- Licensed Clinical
Social Worker- Training Certificate
Speech-Language Pathologist
Substance Abuse Counselor
Substance Abuse Counselor in Training
Veterinarian
Veterinary Technician
Wholesale Distributor of Prescription Drugs

Health Care Boards

Examining Boards

Chiropractic Examining Board
Dentistry Examining Board
Hearing and Speech Examining Board
Marriage and Family Therapy, Professional Counseling and Social Work Examining Board
Medical Examining Board

Board of Nursing
Nursing Home Administrator Examining Board
Optometry Examining Board
Pharmacy Examining Board
Physical Therapy Examining Board
Psychology Examining Board
Radiography Examining Board
Veterinary Examining Board

Boards
Controlled Substance Board

Credentialing Boards Attached to the Medical Examining Board
Athletic Trainers Affiliated Credentialing Board
Dietitians Affiliated Credentialing Board
Massage Therapy and Bodywork Therapy Affiliated Credentialing Board
Occupational Therapists Affiliated Credentialing Board
Podiatry Affiliated Credentialing Board

Councils
Council on Anesthesiologist Assistants
Examining Council on Registered Nurses
Examining Council on Licensed Practical Nurses
Perfusionist Examining Council
Pharmacist Advisory Council
Council on Physician Assistants
Respiratory Care Practitioners Examining Council
Sign Language Interpreter Council

Appendix B: All Boards and Councils under purview of DSPS

Examining Boards

Accounting Examining Board
Examining Board of Architects, Landscape Architects, Professional Engineers, Designers, and Land Surveyors
Chiropractic Examining Board
Cosmetology Examining Board
Dentistry Examining Board
Funeral Directors Examining Board
Examining Board of Professional Geologists, Hydrologists, and Soil Scientists
Hearing and Speech Examining Board
Marriage and Family Therapy, Professional Counseling, and Social Work Examining Board
Medical Examining Board
Board of Nursing
Nursing Home Administrator Examining Board
Optometry Examining Board
Pharmacy Examining Board
Physical Therapy Examining Board
Psychology Examining Board
Radiography Examining Board
Real Estate Examining Board
Veterinary Examining Board

Boards

Auctioneer Board
Building Inspector Review Board
Cemetery Board
Controlled Substances Board
Real Estate Appraisers Board

Affiliated Credentialing Boards

Athletic Trainers Affiliated Credentialing Board
Dietitians Affiliated Credentialing Board
Massage Therapy and Bodywork Therapy Affiliated Credentialing Board
Occupational Therapists Affiliated Credentialing Board
Podiatry Affiliated Credentialing Board

Councils

Council on Anesthesiologist Assistants
Crematory Authority Council
Automatic Fire Sprinkler System Contractors and Journeymen Council
Contractor Certification Council
Conveyance Safety Code Council
Dwelling Code Council
Manufactured Housing Code Council
Multifamily Dwelling Code Council
Examining Council on Registered Nurses
Examining Council on Licensed Practical Nurses
Perfusionist Examining Council
Pharmacist Advisory Council
Plumbers Council
Council on Physician Assistants
Council on Real Estate Curriculum and Examinations
Respiratory Care Practitioners Examining Council
Sign Language Interpreter Council

Advisory Committees[13]

Alteration and Change of Occupancy Council
Amusement Ride Code Council
Boiler and Pressure Vessel Code Council
Commercial Buildings Code Council
Conveyance Safety Code Council
Electrical Code Council

[13] Under Wisconsin Statute 440.042, the Secretary of DSPS may convene an advisory committee to advise on any matter related to the regulation of credential holders.

Energy Conservation Council
Erosion and Stormwater Council
Fire Department Safety and Health Code Council
Fire Prevention Code Council
Fire Protection Systems Council
Fire Safety Council
Gas Systems Code Council
General Task Group
HVAC Council
Means of Egress Council
Mechanical Refrigeration Code Council
Passenger Ropeways Code Council
Plumbing Code Council
Pool Code Council
POWTS Code Council
POWTS Technical Committee
Public Employee Safety and Health Code Council
Rental Unit Energy Efficiency Code Council
Stormwater Workgroup
Structural Review Council
Wisconsin Fund Code Council

Appendix C: Health Care Service Categories

Health Care Service Category	Relation to DSPS
Hospital Care: Covers all services provided by hospitals to patients. These include room and board, ancillary charges, services of resident physicians, inpatient pharmacy, hospital-based nursing home and home health care, and any other services billed by hospitals in the United States. The value of hospital services is measured by total net revenue, which equals gross patient revenues (charges) less contractual adjustments, bad debts, and charity care. It also includes government tax appropriations as well as non-patient and non-operating revenues.	These services are generated by DSPS credentialed health care professionals.
Physician and Clinical Services: Covers services provided in establishments operated by Doctors of Medicine (M.D.) and Doctors of Osteopathy (D.O.), outpatient care centers, plus the portion of medical laboratories services that are billed independently by the laboratories. This category also includes services rendered by a doctor of medicine (M.D.) or doctor of osteopathy (D.O.) in hospitals, if the physician bills independently for those services. Clinical services provided in freestanding outpatient clinics operated by the U.S. Department of Veterans' Affairs, the U.S. Coast Guard Academy, the U.S. Department of Defense, and the U.S. Indian Health Service are also included.	DSPS credentials Doctors of Medicine and Doctors of Osteopathy.
Other Professional Services: Covers services provided in establishments operated by health practitioners other than physicians and dentists. These professional services include those provided by private-duty nurses, chiropractors, podiatrists, optometrists, and physical, occupational and speech therapists, among others.	DSPS credentials nurses; chiropractors; podiatrists; optometrists; physical, occupational, and speech therapists; among other health professionals. See Appendix A for a complete list.
Prescription Drugs: Covers the "retail" sales of human-use dosage-form drugs, biological drugs, and diagnostic products that are available only by a prescription.	DSPS credentials pharmacists, pharmacies, wholesale distributors of prescription drugs, drug or device manufacturers, and professionals with the authority to prescribe.
Other Non-Durable Medical Products: Covers the "retail" sales of non-prescription drugs and medical sundries.	DSPS credentials pharmacists, drug or device manufacturers, and

	the health professionals advising purchases of non-durable medical products.
Nursing Home Care: Covers nursing and rehabilitative services provided in freestanding nursing home facilities. These services are generally provided for an extended period of time by registered or licensed practical nurses and other staff. Care received in state and local government facilities and nursing facilities operated by the U.S. Department of Veterans Affairs are also included.	DSPS credentials registered nurses, licensed practical nurses, and advanced practice nurse prescribers.
Dental Services: Covers services provided in establishments operated by a Doctor of Dental Medicine (D.M.D.) or Doctor of Dental Surgery (D.D.S.) or a Doctor of Dental Science (D.D.Sc.).	DSPS credentials dentists and dental hygienists.
Home Health Care: Covers medical care provided in the home by freestanding home health agencies (HHAs). Medical equipment sales or rentals not billed through HHAs and non-medical types of home care (e.g., Meals on Wheels, chore-worker services, friendly visits, or other custodial services) are excluded.	DSPS credentials health professionals responsible for providing home health care. See Appendix A for a complete list of health professions regulated by DSPS.
Medical Durables: Covers "retail" sales of items such as contact lenses, eyeglasses and other ophthalmic products, surgical and orthopedic products, hearing aids, wheelchairs, and medical equipment rentals.	Health professionals credentialed by DSPS directly and indirectly induce the consumption of medical durables.
Other Health, Residential, and Personal Care: This category includes spending for Medicaid home and community based waivers, care provided in residential care facilities, ambulance services, school health and worksite health care. Generally these programs provide payments for services in non-traditional settings such as community centers, senior citizens centers, schools, and military field stations. The residential establishments are classified as facilities for the intellectually disabled and mental health and substance abuse facilities. The ambulance establishments are classified as Ambulance services.	DSPS credentials health professionals typically responsible for health, residential, and personal care including professional counselors, substance abuse counselors, psychiatrists, and psychologists. See Appendix A for a complete list of health professions regulated by DSPS.

References

Austin, Sam. 2013. *Regulation of Professional Occupations by the Department of Safety and Professional Services*. Madison, WI: Wisconsin Legislative Fiscal Bureau. http://legis.wisconsin.gov/lfb/publications/Informational-Papers/Documents/2013/98_Regulation%20of%20Professional%20Occupations%20by%20DSPS.pdf

Centers for Medicare & Medicaid Services. 2011. *Health Expenditures by State of Provider, 1980-2009*. Baltimore, MD: Centers for Medicare and Medicaid Services. http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsStateHealthAccountsProvider.html

Clark, David E. and Steven E. Crane. 2011. *The Impact of Construction on the Wisconsin Economy*. Madison, WI: Skill Integrity Responsibility Council, Inc. http://buildacea.org/wp-content/uploads/AGC-Impact-Study.pdf

Foster, Ann C. 2011. *Household Health Care Spending: Comparing the Consumer Expenditure Survey and the National Health Expenditure Accounts*. Washington, D.C.: U.S. Bureau of Labor Statistics. http://www.bls.gov/cex/nhe_compare_200710.pdf

NAR Research. 2013. *Economic Impact of Real Estate Activity (PowerPoint)*. Chicago, IL: National Association of Realtors. http://www.realtor.org/sites/default/files/reports/2013/Economic%20Impact/economic-impact-real-estate-activity-wisconsin-2013-03.pdf

U.S. Bureau of Economic Analysis. 2013a. "Real GDP by state (millions of 2005 dollars)." (Accessed June 27, 2013). http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1

U.S. Bureau of Economic Analysis. 2013b. "Total full-time and part-time employment by NAICS industry." (Accessed June 27, 2013). http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1

U.S. Bureau of Economic Analysis. 2013c. "Table SA07. Total for wage and salary disbursements by industry and Table SA 27 Total full-time and part-time wage and salary employment by industry." (Accessed June 27, 2013). http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1

Wisconsin Department of Safety and Professional Services. 2012. *Agency Budget Request 2013-2015Biennium*. Madison, WI: Wisconsin Department of Safety and Professional Services. ftp://doaftp1380.wi.gov/doadocs/165%20-%20rev%202012-10-11.pdf

Wisconsin Department of Workforce Development. 2012. *Occupational and Employment Statistics.* Madison, WI: Wisconsin Department of Workforce Development. http://worknet.wisconsin.gov/worknet/downloads.aspx?menuselection=da&pgm=OES

Wisconsin REALTORS® Association. 2013. *June Home Sales Report*. Madison, WI. https://www.wra.org/HSRJune2013/

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Shawn Leatherwood	September 17, 2013 Items will be considered late if submitted after 4:30 p.m. and less than: ▪ 10 work days before the meeting for Medical Board ▪ 08 work days before the meeting for all others

3) Name of Board, Committee, Council, Sections:
Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	Scope Statement Review

7) Place item in:	8) Is an appearance before the Board being scheduled? If yes, who is appearing?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes by (name) ☒ No	N/A

10) Describe the issue and action that should be addressed:

The Board shall approve the Scope Statement on s. Pod 3.01 and Pod 3.04 relating to continuing education audit requirement for submission to the Governor's office and publication and to authorize the Chair to approve the scope for implement no less than 10 days after publication.

11) Authorization

Shawn Leatherwood	September 17, 2013
Signature of person making this request	Date
Supervisor (if required)	Date
Bureau Director signature (indicates approval to add post agenda deadline item to agenda)	Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Board Services Bureau Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

STATEMENT OF SCOPE

PODIATRY AFFILIATED CREDENTIALING BOARD

Rule No.: 165 - Pod 3.04

Relating to: Continuing Education Audits

Rule Type: Permanent

1. Finding/nature of emergency (Emergency Rule only):

N/A

2. Detailed description of the objective of the proposed rule:

The objective of this proposed rule is to empower the Podiatry Affiliated Credentialing Board (Board) with the ability to conduct continuing education (CE) audits of its licensees on a biennial basis.

3. Description of the existing policies relevant to the rule, new policies proposed to be included in the rule, and an analysis of policy alternatives:

Pursuant to s. Pod 3.04, the Board may require a podiatrist, "to submit evidence to the board of his or her compliance with continuing education requirements during the preceding biennium". However, the administrative rules do not identify when an audit should take place or how long a podiatrist should maintain evidence of compliance. The proposed rule seeks to address these two issues by specifying the time period for continuing education audits and by specifying the time period for maintaining documentary evidence of CE compliance.

Wis. Stats. § 448.665, states that, "the rules shall require a licensee to complete at least 30 hours of continuing education programs or courses of study within each 2-year period immediately preceding the renewal date specified in s. 440.08 (2) (a)". That renewal date is November 1st of each even numbered year. The proposed rule would change the language in s. Pod 3.01 to reflect the statutory language. Lastly, s. Pod 3.04 would be amended to require licensees to maintain evidence of CE compliance on a biennial basis. The proposed rule may include other amendments to the regulations governing podiatrists based on changes to s. Pod. 3.

4. Detailed explanation of statutory authority for the rule (including the statutory citation and language):

Section 227.11 (2), Stats., discusses the parameters of an agency's rule-making authority stating an agency, "may promulgate rules interpreting the provisions of nay statute enforced or administered by it, if the agency considers it necessary to effectuate the purpose of any statute, but a rule is not valid if it exceeds the bounds of correct interpretation." Section 227.01 (1), Stats., defines agency as a board. The Podiatry Affiliated Credentialing Board falls within that definition. Therefore, the Board may promulgate administrative rules which interpret the statutes it enforces or administers as long as the proposed rule does not exceed proper interpretation of the statute.

Section 448.665, Stats., provides that, "[t]he affiliated credentialing board shall promulgate rules establishing requirements and procedures for licensees to complete continuing education programs or courses of study in order to qualify for renewal of a license granted under this subchapter." This provision empowers the Board to promulgate rules setting forth the process of conducting credential renewal after meeting continuing education requirements.

5. Estimate of amount of time that state employees will spend developing the rule and of other resources necessary to develop the rule:

State employees will spend approximately 50 hours developing the proposed rule.

6. List with description of all entities that may be affected by the proposed rule:

Wisconsin licensed podiatrist will be affected by this proposed rule.

7. Summary and preliminary comparison with any existing or proposed federal regulation that is intended to address the activities to be regulated by the proposed rule:

There is no comparable existing or proposed federal regulations dealing with this issue.

8. Anticipated economic impact of implementing the rule (note if the rule is likely to have a significant economic impact on small businesses):

This rule is not likely to have a significant economic impact on small businesses.

Contact Person: Shawn Leatherwood 608-261-4438

_____
Department Head or Authorized Signature

_____
Date Submitted

Page intentionally left blank

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Shawn Leatherwood	August 2, 2013 Items will be considered late if submitted after 4:30 p.m. and less than: ▪ 10 work days before the meeting for Medical Board ▪ 14 work days before the meeting for all others

3) Name of Board, Committee, Council, Sections:
Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	Review of Pod 3.01, 4.01 and 4.03 (2)

7) Place Item in:	8) Is an appearance before the Board being scheduled? If yes, who is appearing?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes by (name) ☒ No	N/A

10) Describe the issue and action that should be addressed:

The Board will review and discuss POD 3.01 4.01 and 4.03 (2) and s. 440.08 (2) (a) 60, and 448.665, Stats., for the purpose of determining the biennial registration date.

11) Authorization

Shancethea Leatherwood — August 2, 2013

Signature of person making this request — Date

Supervisor (if required) — Date

Bureau Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Board Services Bureau Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

Chapter Pod 3

CONTINUING PODIATRIC MEDICAL EDUCATION

Pod 3.01 Continuing podiatric medical education required; waiver. (1) Each podiatrist required to complete the biennial training requirement under s. 448.665, Stats., shall, in each second year at the time of making application for a certificate of registration as required under s. 448.665, Stats., sign a statement on the application for registration certifying that the podiatrist has completed at least 50 hours of acceptable continuing educational programs relevant to the practice of podiatric medicine within the 2 calendar years immediately preceding the calendar year for which application for registration is made.

(2) A licensee may apply to the board for a postponement or waiver of the requirements of this chapter on the grounds of prolonged illness, disability, or other grounds constituting hardship. The board shall consider each request individually on its merits and may grant a postponement, partial waiver, or total waiver of the requirements.

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00; CR 06–056: am. (1) and (2) Register April 2007 No. 616, eff. 5–1–07; correction in (1) made under s. 13.93 (2m) (b) 7., Stats., Register April 2007 No. 616.

Pod 3.02 Acceptable continuing medical educational programs. (1) In satisfaction of the biennial training requirement under s. 448.665, Stats., the board shall accept an educational program approved at the time of the podiatrist's attendance by any of the following:

(a) The council on podiatric medical education of the American podiatric medical association.

(b) The council on medical education of the American medical association.

(c) The council on medical education of the American osteopathic association.

(d) The accreditation council for continuing medical education.

(e) The Wisconsin Society of Podiatric Medicine.

(2) An educational program provided outside the United States may be used for continuing education credit if the program is approved by the board.

(3) One hour of attendance by a podiatrist at a continuing education program is the equivalent of one hour of continuing podiatric medical education for purposes of s. Pod 3.01 (1).

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00; CR 06–056: am. (1) (intro.) Register April 2007 No. 616, eff. 5–1–07; correction in (1) (intro.) made under s. 13.93 (2m) (b) 7., Stats., Register April 2007 No. 616; CR 07–103: cr. (1) (e) Register September 2008 No. 633, eff. 10–1–08.

Pod 3.03 Evidence of compliance. (1) Certification by the providing organization or by one of the approved accrediting bodies of attendance at and completion of continuing medical education programs approved under s. Pod 3.01 is satisfactory evidence for purposes of sub. (2) and s. Pod 3.03.

(2) Evidence of compliance shall be retained by each podiatrist through the biennium for which 50 hours of credit are required for registration.

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00.

Pod 3.04 Audit. The board may require any podiatrist to submit evidence to the board of his or her compliance with continuing education requirements during the preceding biennium.

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00.

Chapter Pod 4

BIENNIAL REGISTRATION

Pod 4.01 Registration required; method of registration. Each licensee shall register biennially with the board. Prior to November 1 of each odd–numbered year the department shall mail to each licensee at his or her last known address an application form for registration. Each licensee shall complete the application form and return it with the required fee prior to November 1 of that year. The board shall notify the licensee within 30 business days of receipt of a completed registration form whether the application for registration is approved or denied.

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00.

Pod 4.02 Registration prohibited, annulled; reregistration. Any podiatrist required to comply with the provisions of s. 448.665, Stats., and of ch. Pod 3, and who has not so complied, shall not be permitted to register. Any person whose license has been suspended or revoked shall not be permitted to register, and the registration of any person shall be automatically annulled upon the effective date of the board's order suspending or revoking the license. A person whose license has been suspended or revoked and subsequently restored shall be reregistered by the board upon receipt by the board of a completed registration form.

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00.

Pod 4.03 Failure to be registered. (1) A licensee who fails for whatever reason to be registered as required under this chapter shall not exercise the rights or privileges conferred by any license granted by the board.

(2) Failure to renew a license by November 1 of odd–numbered years shall cause the license to lapse. A licensee who allows the license to lapse may apply to the board for reinstatement of the license as follows:

(a) If the licensee applies for renewal of the license less than 5 years after its expiration, the license shall be renewed upon payment of the renewal fee and fulfillment of the continuing education requirements.

(b) If the licensee applies for renewal of the license more than 5 years after its expiration, the board shall make an inquiry to determine whether the applicant is competent to practice under the license in this state, and shall impose any reasonable conditions on reinstatement of the license, including oral examination, as the board deems appropriate. All applicants under this paragraph shall be required to pass the open book examination on statutes and rules, which is the same examination given to initial applicants.

History: Cr. Register, January, 2000, No. 529, eff. 2–1–00.

50. Nurse–midwife: March 1 of each even–numbered year.

51. Nursing home administrator: July 1 of each even–numbered year.

52. Occupational therapist: June 1 of each odd–numbered year.

53. Occupational therapy assistant: June 1 of each odd–numbered year.

54. Optometrist: December 15 of each odd–numbered year.

54m. Perfusionist: March 1 of each even–numbered year.

55. Pharmacist: June 1 of each even–numbered year.

56. Pharmacy, in–state and out–of–state: June 1 of each even–numbered year.

57. Physical therapist: March 1 of each odd–numbered year.

57m. Physical therapist assistant: March 1 of each odd–numbered year.

58. Physician, other than a physician who possesses the degree of doctor of osteopathy: November 1 of each odd–numbered year.

58m. Physician who possesses the degree of doctor of osteopathy: March 1 of each even–numbered year.

59. Physician assistant: March 1 of each odd–numbered year.

60. Podiatrist: November 1 of each even–numbered year.

61. Private detective: September 1 of each even–numbered year.

62. Private detective agency: September 1 of each odd–numbered year.

63. Private practice school psychologist: October 1 of each odd–numbered year.

63g. Private security person: September 1 of each even–numbered year.

63m. Professional counselor: March 1 of each odd–numbered year.

63p. Professional employer organization or professional employer group: July 31 of each year.

63t. Professional fund–raiser: September 1 of each even–numbered year.

63u. Professional geologist: August 1 of each even–numbered year.

63v. Professional geology, hydrology or soil science firm, partnership or corporation: August 1 of each even–numbered year.

63w. Professional hydrologist: August 1 of each even–numbered year.

63x. Professional soil scientist: August 1 of each even–numbered year.

64. Psychologist: October 1 of each odd–numbered year.

64g. Radiographer, licensed: September 1 of each even–numbered year.

65. Real estate broker: December 15 of each even–numbered year.

66. Real estate business entity: December 15 of each even–numbered year.

67. Real estate salesperson: December 15 of each even–numbered year.

67m. Registered interior designer: August 1 of each even–numbered year.

67v. Registered music, art or dance therapist: October 1 of each odd–numbered year.

67x. Registered music, art, or dance therapist with psychotherapy license: October 1 of each odd–numbered year.

68. Respiratory care practitioner: July 1 of each even–numbered year.

68b. Sanitarian: January 1 of each even–numbered year.

68c. Sign language interpreter: September 1 of each odd–numbered year.

68d. Social worker: March 1 of each odd–numbered year.

68h. Social worker, advanced practice: March 1 of each odd–numbered year.

68p. Social worker, independent: March 1 of each odd–numbered year.

68t. Social worker, independent clinical: March 1 of each odd–numbered year.

68v. Speech–language pathologist: February 1 of each odd–numbered year.

69. Time–share salesperson: December 15 of each even–numbered year.

70. Veterinarian: December 15 of each odd–numbered year.

71. Veterinary technician: December 15 of each odd–numbered year.

72. Wholesale distributor of prescription drugs: June 1 of each even–numbered year.

(b) The renewal fee for an apprentice, journeyman, student or temporary credential is $10. The renewal dates specified in par. (a) do not apply to apprentice, journeyman, student or temporary credentials.

(c) Except as provided in sub. (3), renewal applications shall include the applicable renewal fee as determined by the department under s. 440.03 (9) (a) or as specified in par. (b).

(d) If an applicant for credential renewal requests that the department process an application on an expedited basis, the applicant shall pay a service fee that is equal to the department's best estimate of the cost of processing the application on an expedited basis, including the cost of providing counter or other special handling services.

(3) LATE RENEWAL. (a) Except as provided in rules promulgated under par. (b), if the department does not receive an application to renew a credential before its renewal date, the holder of the credential may restore the credential by payment of the applicable renewal fee determined by the department under s. 440.03 (9) (a) and by payment of a late renewal fee of $25.

(b) The department or the interested examining board or affiliated credentialing board, as appropriate, may promulgate rules requiring the holder of a credential who fails to renew the credential within 5 years after its renewal date to complete requirements in order to restore the credential, in addition to the applicable requirements for renewal established under chs. 440 to 480, that the department, examining board or affiliated credentialing board determines are necessary to protect the public health, safety or welfare. The rules may not require the holder to complete educational requirements or pass examinations that are more extensive than the educational or examination requirements that must be completed in order to obtain an initial credential from the department, the examining board or the affiliated credentialing board.

(4) DENIAL OF CREDENTIAL RENEWAL. (a) *Generally.* If the department or the interested examining board or affiliated credentialing board, as appropriate, determines that an applicant for renewal has failed to comply with sub. (2) (c) or (3) or with any other applicable requirement for renewal established under chs. 440 to 480 or that the denial of an application for renewal of a credential is necessary to protect the public health, safety or welfare, the department, examining board or affiliated credentialing board may summarily deny the application for renewal by mailing to the holder of the credential a notice of denial that includes a statement of the facts or conduct that warrant the denial and a notice that the holder may, within 30 days after the date on which the notice of denial is mailed, file a written request with the department to have the denial reviewed at a hearing before the department, if the department issued the credential, or before the examining board or affiliated credentialing board that issued the credential.

(b) *Applicability.* This subsection does not apply to a denial of a credential renewal under s. 440.12 or 440.13 (2) (b).

History: 1991 a. 39 ss. 3305, 3313; 1991 a. 78, 160, 167, 269, 278, 315; 1993 a. 3, 16, 102, 105, 107, 443, 463, 465; 1993 a. 490 ss. 228 to 230, 274, 275; 1995 a. 27, 233, 321, 322, 461; 1997 a. 27, 75, 81, 96, 156, 191, 237, 261, 300; 1999 a. 9, 32; 2001

(2) The renewal date for a license granted under this subchapter, other than a temporary license granted under rules promulgated under s. 448.63 (3), is specified under s. 440.08 (2) (a). Renewal applications shall be submitted to the department on a form provided by the department and shall be accompanied by all of the following:

(a) The renewal fee determined by the department under s. 440.03 (9) (a).

(b) Proof of completion of continuing education requirements in s. 448.665.

(3) A licensee whose license is lost, stolen or destroyed may apply to the department for a duplicate license. Duplicate license applications shall be submitted to the department on a form provided by the department and shall be accompanied by the fee specified under s. 440.05 (7) and an affidavit setting out the circumstances of the loss, theft or destruction of the license. Upon receipt of an application under this subsection, the department shall issue a duplicate license bearing on its face the word "duplicate".

History: 1997 a. 175; 2007 a. 20; 2009 a. 276.

Cross–reference: See also ch. Pod 4, Wis. adm. code.

448.655 Malpractice liability insurance. (1) A licensed podiatrist shall annually submit to the affiliated credentialing board evidence satisfactory to the affiliated credentialing board that the podiatrist satisfies one of the following:

(a) The podiatrist has in effect malpractice liability insurance coverage in the amount of at least $1,000,000 per occurrence and $1,000,000 for all occurrences in one year.

(b) The podiatrist meets all of the following conditions:

1. The podiatrist's principal place of practice is not in this state.

2. The podiatrist will not be engaged in the practice of podiatry in this state for more than 240 hours during the following 12 months.

3. The podiatrist has in effect malpractice liability insurance coverage that covers services provided by the podiatrist to patients in this state and which is in one of the following amounts:

a. At least the minimum amount of malpractice liability insurance coverage that is required under the laws of the state in which the affiliated credentialing board determines that his or her principal place of practice is located.

b. If the podiatrist is not required under the laws of the state in which the affiliated credentialing board determines that his or her principal place of practice is located to have in effect a minimum amount of malpractice liability insurance coverage, at least the minimum amount of malpractice liability insurance coverage that the affiliated credentialing board determines is necessary to protect the public.

(2) For purposes of sub. (1), a podiatrist's principal place of practice is not in this state if the affiliated credentialing board determines that, during the following 12 months, any of the following applies:

(a) More than 50% of the podiatrist's practice will be performed outside this state.

(b) More than 50% of the income from the podiatrist's practice will be derived from outside this state.

(c) More than 50% of the podiatrist's patients will be treated by the podiatrist outside this state.

(3) The affiliated credentialing board may suspend, revoke or refuse to issue or renew the license of a podiatrist who fails to procure or to submit proof of the malpractice liability insurance coverage required under sub. (1).

History: 1985 a. 340; 1989 a. 152; 1997 a. 175 ss. 51 to 56; Stats. 1997 s. 448.655.

448.66 Malpractice. Except as provided in s. 257.03, a person who practices podiatry without having a license under this subchapter may be liable for malpractice, and his or her ignorance of a duty ordinarily performed by a licensed podiatrist shall not limit his or her liability for an injury arising from his or her practice of podiatry.

History: 1997 a. 175; 2005 a. 96; 2009 a. 42.

448.665 Continuing education. The affiliated credentialing board shall promulgate rules establishing requirements and procedures for licensees to complete continuing education programs or courses of study in order to qualify for renewal of a license granted under this subchapter. The rules shall require a licensee to complete at least 30 hours of continuing education programs or courses of study within each 2–year period immediately preceding the renewal date specified under s. 440.08 (2) (a). The affiliated credentialing board may waive all or part of these requirements for the completion of continuing education programs or courses of study if the affiliated credentialing board determines that prolonged illness, disability or other exceptional circumstances have prevented a licensee from completing the requirements.

History: 1997 a. 175.

Cross–reference: See also ch. Pod 3, Wis. adm. code.

448.67 Practice requirements. (1) FEE SPLITTING. No licensee may give or receive, directly or indirectly, to or from any other person any fee, commission, rebate or other form of compensation or anything of value for sending, referring or otherwise inducing a person to communicate with a licensee in a professional capacity, or for any professional services not actually rendered personally by the licensee or at the licensee's direction.

(2) SEPARATE BILLING REQUIRED. Except as provided in sub. (4), a licensee who renders any podiatric service or assistance, or gives any podiatric advice or any similar advice or assistance, to any patient, podiatrist, physician, physician assistant, advanced practice nurse prescriber certified under s. 441.16 (2), partnership, or corporation, or to any other institution or organization, including a hospital, for which a charge is made to a patient, shall, except as authorized by Title 18 or Title 19 of the federal Social Security Act, render an individual statement or account of the charge directly to the patient, distinct and separate from any statement or account by any other podiatrist, physician, physician assistant, advanced practice nurse prescriber, or other person.

(3) BILLING FOR TESTS PERFORMED BY THE STATE LABORATORY OF HYGIENE. A licensee who charges a patient, other person or 3rd–party payer for services performed by the state laboratory of hygiene shall identify the actual amount charged by the state laboratory of hygiene and shall restrict charges for those services to that amount.

(4) BILLING BY PROFESSIONAL PARTNERSHIPS AND CORPORATIONS. If 2 or more podiatrists have entered into a bona fide partnership or formed a service corporation for the practice of podiatry, the partnership or corporation may not render a single bill for podiatry services provided in the name of the partnership or corporation unless each individual licensed, registered or certified under this chapter or ch. 446, 449, 450, 455, 457 or 459, who provided services is individually identified on the bill as having rendered those services.

History: 1997 a. 175; 2005 a. 187; 2011 a. 161.

448.675 Disciplinary proceedings and actions. (1) INVESTIGATION; HEARING; ACTION. (a) The affiliated credentialing board shall investigate allegations of unprofessional conduct and negligence in treatment by a licensee. Information contained in reports filed with the affiliated credentialing board under s. 49.45 (2) (a) 12r., 50.36 (3) (b), 609.17 or 632.715, or under 42 CFR 1001.2005, shall be investigated by the affiliated credentialing board. Information contained in a report filed with the affiliated credentialing board under s. 50.36 (3) (c) may, within the discretion of the affiliated credentialing board, be used as the basis of an investigation of a person named in the report. The affiliated credentialing board may require a licensee to undergo and may consider the results of a physical, mental or professional competency examination if the affiliated credentialing board believes

Page intentionally left blank

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Shawn Leatherwood, Admin. Rules Coordinator	September 16, 2013
	Items will be considered late if submitted after 4:30 p.m. and less than: ▪ 10 work days before the meeting for Medical Board ▪ 08 work days before the meeting for all others

3) Name of Board, Committee, Council, Sections:
Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	Approval of CR 12-047 Pod 1.08 (5) relating to temporary educational license and continuing education

7) Place Item in:	8) Is an appearance before the Board being scheduled? If yes, who is appearing?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes by (name) ☒ No	N/A

10) Describe the issue and action that should be addressed:

Discuss CR 12-047 Pod 1.08 (5) relating to temporary educational license and continuing education and authorize the Chair or another member of the Board to approve the Legislative Report and Final Draft of Clearinghouse Rule CR 12-047 for submission to the Legislature.

11) Authorization

Shawn Leatherwood — September 16, 2013

Signature of person making this request — Date

Supervisor (if required) — Date

Bureau Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Board Services Bureau Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

STATE OF WISCONSIN
PODIATRY AFFILIATED CREDENTIALING BOARD

IN THE MATTER OF RULE-MAKING PROCEEDINGS BEFORE THE PODIATRY AFFILIATED CREDENTIALING BOARD	:	REPORT TO THE LEGISLATURE CR 12-047

I. THE PROPOSED RULE:

The proposed rule, including the analysis and text, is attached.

II. REFERENCE TO APPLICABLE FORMS:

None.

III. FISCAL ESTIMATE AND EIA:

The Fiscal Estimate and EIA are attached.

IV. DETAILED STATEMENT EXPLAINING THE BASIS AND PURPOSE OF THE PROPOSED RULE, INCLUDING HOW THE PROPOSED RULE ADVANCES RELEVANT STATUTORY GOALS OR PURPOSES:

Currently, in order to be licensed as a podiatrist in Wisconsin an applicant must have completed two years of postgraduate training in a Podiatry Affiliated Board approved program. Wis. Stat. § 448.63 (1) (d) 2. This two-year requirement means an individual must re-apply for a temporary educational license half way through their postgraduate training. This proposed rule seeks to simplify the process by changing in the duration of the temporary educational license from one year to two years.

At this time, all licensees seeking to renew their license must complete 50 hours of continuing education within two calendar years of the specified renewal date. This creates a problem for new licensees who received their license towards the end of the renewal period. The proposed rule will allow first time renewal applicants to use proof of graduation from a school of podiatric medicine to comply with the 50 requisite continuing education hours. This will alleviate the burden on new licensees whose first time renewal occurs towards the end of a renewal period.

V. SUMMARY OF PUBLIC COMMENTS AND THE BOARD'S RESPONSES, EXPLANATION OF MODIFICATIONS TO PROPOSED RULES PROMPTED BY PUBLIC COMMENTS:

The Board held a public hearing on July 30, 2013. No testimony or comments were received at the public hearing.

Written comments were received from Mr. Anthony H. Driessen on behalf of the Wisconsin Society of Podiatric Medicine.

The Board summarizes the comments received by written submission as follows: The Wisconsin Society of Podiatric Medicine supports the proposed rule. The society states that the proposed rule reduces the regulatory burden on new graduates and licensees and that the proposed rule will attract new podiatry licensees.

The Board explains modifications to its rule-making proposal prompted by public comments as follows: No changes were made due to public comment.

VI. RESPONSE TO LEGISLATIVE COUNCIL STAFF RECOMMENDATIONS:

All of the recommendations suggested in the Clearinghouse Report have been accepted in whole.

VII. REPORT FROM THE SBRRB AND FINAL REGULATORY FLEXIBILITY ANALYSIS:

None

STATE OF WISCONSIN
PODIATRY AFFILIATED CREDENTIALING BOARD

IN THE MATTER OF RULE-MAKING PROCEEDINGS BEFORE THE PODIATRISTS AFFILIATED CREDENTIALING BOARD	:	PROPOSED ORDER OF THE PODIATRISTS AFFILIATED CREDENTIALING BOARD ADOPTING RULES (CLEARINGHOUSE RULE 12- 047)

PROPOSED ORDER

An order of the Podiatrists Affiliated Credentialing Board to amend Pod 1.08 (5); and to create Pod 3.02 (4) and 3.03 (3), relating to temporary educational license and continuing education.

Analysis prepared by the Department of Safety and Professional Services.

ANALYSIS

Statutes interpreted:

s. 448.63 (3), Stats.

Statutory authority:

ss. 15.085 (5) (b), 440.035 (1), 448.63 (3), 448.665, Stats.

Explanation of agency authority:

The Podiatrists Affiliated Credentialing Board is charged with promulgating rules that govern their profession via ss. 15.085 (5) (b), and 440.035 (1), Stats., under the oversight of the Medial Examining Board. Pursuant to s. 448.63 (3), Stats., the Podiatrists Affiliated Credentialing Board has authority to write rules concerning various classes of temporary licensure. Section 448.665, Stats., grants rule writing authority for establishing requirements for continuing education. Therefore, the Podiatrists Affiliated Credentialing Board is generally and specifically vested with the authority to promulgate these rules.

Related statute or rule:

chs. Pod 1 and Pod 3

Plain language analysis:

The proposed rule will address two issues: license holders having to reapply for a temporary license half way through their post graduate training and the requirements for

licensees seeking first time renewal. By changing the duration of the temporary license from 1 year to 2 years, the proposed rule eliminates the need for temporary licensees to reapply for licensure while they are completing their post graduate training. As to the second issue, the proposed rule allows first time renewal applicants to use proof of graduation from a school of podiatric medicine to comply with the 50 requisite continuing education hours currently required by rule. This alleviates the burden on new licensees whose first time renewal occurs towards the end of a renewal period.

SECTION 1. amends the provision governing the duration of temporary licensure changing the requirement from1 year to 2 years.

SECTION 2. creates a provision for accepting proof that the podiatrist graduated from a school of podiatric medicine.

SECTION 3. creates a provision accepting a certified copy of an official transcript or a certified copy of a diploma from a school of podiatric medicine and surgery.

Summary of, and comparison with, existing or proposed federal regulation:

None

Comparison with rules in adjacent states:

Illinois:

A temporary license is valid for one year. 68 Ill. Adm. Code 1360.65(b) (2012) A renewal applicant is not required to comply with continuing education requirements for his/her first renewal. 68 Ill. Adm. Code 1360.70(a)(3) (2012)

Iowa:

A temporary license is valid for one year. 645 IAC 220.6(149)(1) (2012)
First time licensees are not required to complete continuing education requirements for their first renewal period. 645 IAC 222.2(149,272C)(2) (2012)

Michigan:

There is no language stating the duration for a temporary license. MICH. ADMIN. CODE R 338.8109 (2012) The Administrative code is silent with regards to the continuing education requirements for a first renewal. MICH. ADMIN. CODE R 338.3703 (2012)

Minnesota:

A temporary permit is valid for 12 months, starting on the first day of graduate training. Minn. R. 6900.0160 Subp. 2. (2011) The continuing education requirement for a first

renewal is not entirely waived, but rather the hours are prorated according to how long the applicant has had his/her license. Minn. R. 6900.0300 Subp.1a. (2011)

Summary of factual data and analytical methodologies:

The Podiatrists Affiliated Credentialing Board reviewed the pertinent rules and determined that s. Pod 1.08 (5) should be revised to address the issue of podiatric temporary license holders reapplying for a temporary license half way through their required 2-year post graduate training. The issue is resolved by these proposed rules by changing the duration of temporary licensure from1 year to 2 years. There was also a need to resolve the issue of licensees who are first time renewals seeking to fulfill their 50 hours of continuing education. These proposed rules will allow applicants, in the first year of their renewal period, to satisfy the continuing education requirement with approved verified documentary evidence of graduation from a school of podiatric medicine and surgery such as a verified copy of the diploma conferring the degree of doctor of podiatric medicine. The Board ensures the accuracy, integrity, objectivity and consistency of the data used in preparing the proposed rule and related analysis.

Analysis and supporting documents used to determine effect on small business or in preparation of economic impact report:

This rule has no impact on small business.

Anticipated costs incurred by private sector:

The department finds that this rule has no significant fiscal effect on the private sector.

Fiscal Estimate and EIA:

The Fiscal Estimate and Economic Impact Analysis are attached.

Effect on small business:

These proposed rules do not have an economic impact on small businesses, as defined in s. 227.114 (1), Stats. The Department's Regulatory Review Coordinator may be contacted by email at Jeffrey.Weigand@wisconsin.gov, or by calling (608) 267-9794.

Agency contact person:

Shawn Leatherwood, Department of Safety and Professional Services, 1400 East Washington Avenue, Room 116, P.O. Box 8935, Madison, Wisconsin 53708; telephone 608-266-0495; email at Shancethea.leatherwood@wisconsin.gov.

Place where comments are to be submitted and deadline for submission:

Comments may be submitted to Shawn Leatherwood, Department of Safety and Professional Services, 1400 East Washington Avenue, Room 116, P.O. Box 8935, Madison, Wisconsin 53708-8935, or by email to Shancethea.leatherwood@wiscosin.gov. Comments must be received on or before July 30, 2013 to be included in the record of rule-making proceedings.

TEXT OF RULE

SECTION 1. Pod 1.08 (5) is amended to read:

Pod 1.08 (5) Temporary educational licenses granted under this chapter shall expire ~~one year~~ 2 years from date of issuance.

SECTION 2. Pod 3.02 (4) is created to read:

Pod 3.02 (4) The board shall accept as satisfaction of the biennial training requirement under of s. 448.665, Stats., evidence that the podiatrists graduated from a school of podiatric medicine and surgery approved by the board pursuant to s. Pod 1.03 (2), as long as both of the following are in effect:

(a) The podiatrist is, for the first time, renewing a license to practice podiatric medicine and surgery in Wisconsin.

(b) The podiatrist graduated within 2 calendar years immediately preceding the calendar year for which the application for registration was made.

SECTION 3. Pod 3.03 (3) is created to read:

Pod 3.03 (3) A certified copy of an official transcript or a diploma from an approved school of podiatric medicine and surgery from which the podiatrist graduated is satisfactory evidence of compliance with s. Pod 3.02 (4), provided that the requirements of s. 3.02 (4) (a) and (b) have been met.

SECTION 4. EFFECTIVE DATE. The rules adopted in this order shall take effect on the first day of the month following publication in the Wisconsin administrative register, pursuant to s. 227.22 (2) (intro.), Stats.

(END OF TEXT OF RULE)

Dated _____ Agency _____

Member
Podiatry Affiliated Credentialing Board

Page intentionally left blank

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Shawn Leatherwood	**September 24, 2013** Items will be considered late if submitted after 4:30 p.m. and less than: ▪ 10 work days before the meeting for Medical Board ▪ 08 work days before the meeting for all others

3) Name of Board, Committee, Council, Sections:
Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	**Medical Examining Board's recommendation on s. 165-Pod 1.02, 7 Podiatric x-ray assistants**

7) Place Item in:	8) Is an appearance before the Board being scheduled? If yes, who is appearing?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes by (name) ☒ No	N/A

10) Describe the issue and action that should be addressed:

The Board will discuss the recommendation of the Medical Examining Board and either accept or reject the recommendation.

Pursuant to Wis. Stat. § 15.085(5) (b) 1. The Medical Examining Board makes this recommendation to the Podiatry Affiliated Credentialing Board.

The Medical Examining Board made a motion to recommend to the Podiatry Affiliated Credentialing Board that attendees successfully complete an examination demonstrating knowledge and understanding of the topics under POD 7.01 (3). Motion carried unanimously.

11) Authorization

Shawn Leatherwood	September 24, 2013
Signature of person making this request	**Date**
Supervisor (if required)	**Date**
Bureau Director signature (indicates approval to add post agenda deadline item to agenda)	**Date**

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Board Services Bureau Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

Page intentionally left blank

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Shawn Leatherwood	**September 24, 2013** Items will be considered late if submitted after 4:30 p.m. and less than: ▪ 10 work days before the meeting for Medical Board ▪ 08 work days before the meeting for all others

3) Name of Board, Committee, Council, Sections:
Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	**Discussion of ASRT Radiography Curriculum**

7) Place Item in:	8) Is an appearance before the Board being scheduled? If yes, who is appearing?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes by (name) ☒ No	N/A

10) Describe the issue and action that should be addressed:

The Board will discuss the American Society of Radiologic Technologists' Radiography Curriculum and make any amendments necessary to 165-POD 1.02,7 X-ray assistants.

11) Authorization

Shawn Leatherwood — September 24, 2013

Signature of person making this request — Date

Supervisor (if required) — Date

Bureau Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Board Services Bureau Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

From: william weis
Sent: Tuesday, September 24, 2013 1:10 PM
To: Ryan, Thomas - DSPS
Subject: Fw: Podiatry training

Hi Tom,

Here is the email I was talking about with the Radiology board member.

Let me know what you think.

Thanks,

Bill

William Weis, DPM, FACFAS

Sent: Monday, September 23, 2013 3:41 PM
Subject: Re: Podiatry training

Hi Bill,

When we finalized the radiography educational components with the state we had to create a specific curriculum (1 for the limited x-ray machine operators and 1 for the licensed radiographers). This curriculum outlined the components needed for the educational requirement to be accepted. I have attached the radiography curriculum as an example (or you could use to duplicate content you have highlighted as core components of the program). Do you have a document like this yet? If so could you forward that on to me?

If you need any help creating this let me know.

Thanks,
Jim

On Mon, Sep 23, 2013 at 3:27 PM, william weis wrote:
Hi Jim,

Here is the final proposed changes we talked about last time. They are also in the minutes of the last Podiatry Board meeting so the DSPS staff has access to them too if needed.

Hope all is well.

Bill

William Weis, DPM, FACFAS

From: James **Sent:** Monday, September 23, 2013 2:36 PM
Subject: Podiatry training

Hi Bill,

Could you please send the podiatry x-ray assistant curriculum to me. The radiography examining board would like to wrap this up. We have our next meeting in Dec.

Thanks,
Jim

Radiography Curriculum

Sponsored by the American Society of Radiologic Technologists, 15000 Central Ave. SE, Albuquerque, NM 87123-3909.

Radiography Curriculum *was produced by the ASRT Radiography Curriculum Revision Project Group.*

Introduction

The first ASRT Radiography Curriculum was written in 1952. Throughout its history, the goal of this document has been to outline a common body of knowledge that is essential for entry-level radiographers. The challenge in any curriculum is to give students a solid foundation of traditional core knowledge while also providing opportunities to develop skills that will serve them beyond entry to the radiologic science profession. In particular, students must develop skills in areas such as information literacy, scientific inquiry, self-reflection, collaboration and mentoring.

The guidance provided by this curriculum document will span the time period prior to and after the projected Jan. 1, 2015 start date of the American Registry of Radiologic Technology's minimum associate degree requirement for candidates seeking professional certification. The focus of this document is on the pre-professional core instructional content that will be expanded with institution-specific course content to fulfill metrics for receipt of an academic degree. It is beyond the scope of this document to outline administrative strategies for programs that are unable to award graduates an academic degree to comply with the ARRT 2015 degree requirement.

Postsecondary general education content is included as a "required" element of this radiography curriculum. General education provides an opportunity for personal enrichment and exploration outside the confines of the technical professional curriculum. The general education content objectives in this curriculum were purposely labeled "global content objectives" to give program officials flexibility in determining specific credit-bearing course work that will satisfy these objectives. Following 2015, it is expected that this component of the entry-level curriculum will be satisfied with general education courses needed to fulfill institution-specific degree requirements.

This curriculum is designed to ensure that entry-level radiographers possess the technical skills outlined in the ASRT Radiography Practice Standards. In addition, the graduate will exhibit the following professional characteristics:

- Prudent judgment in administering ionizing radiation to produce diagnostic images.
- A focus on providing optimum patient care in a society that is becoming increasingly diverse and experiencing generational, cultural and ethnic shifts.
- The ability to work with others in a team relationship.
- An understanding of the intricacies associated with providing direct patient care in today's health care setting.
- The skill to use modern technologies to research and retrieve information, weigh and discriminate between good and poor sources of information, and take action based upon the acquisition of new information and knowledge.
- Stewardship over the security and confidentiality associated with patient medical information.

- Skills that promote career-long learning, where the radiographer assumes the role of student and that of teacher.
- An eagerness to collaborate with others in the medical imaging community to promote standards of excellence in the medical imaging sciences.
- A willingness to contribute to the education and clinical skills development of radiologic science students.

The document itself is divided into specific content areas: pre-professional core and optional content.

- Pre-professional core content: This content makes up the body of the document and reflects educational content the professional community supports as essential for preparation to enter the radiography field. Specific instructional methods were intentionally omitted to allow for programmatic prerogative as well as creativity in instructional delivery.
- Optional content: This section is intended to decrease the hardship imposed on programs by requiring instructional content that is representative of technologies and technical principles that have been replaced with newer technical systems. It is recognized that traditional technologies are still part of the fabric of many communities. Content in this section will assist program planners wishing to enhance the curriculum with select topics of instruction intended to satisfy the mission of a given program or local employment market.

A list of learning objectives and appendices indexed by content area has been incorporated into this document to serve as a resource for program planners and course managers. Faculty members also are encouraged to expand and broaden these fundamental objectives as they incorporate them into their curricula.

Radiography programs are encouraged to organize the content and objectives to meet their individual goals and needs. In particular, students must develop skills in areas such as information literacy, scientific inquiry, self-reflection, collaboration and mentoring. Advances in technology and employer expectations require more independent judgment by radiographers.

The ASRT Radiography Curriculum serves as a blueprint for educators to follow in designing their programs and in ensuring that their programs match the profession's standards. In the radiologic sciences, educators not only must teach the essential clinical skills that employers expect of graduates, but also must ensure that students will be prepared to take certification examinations offered by the ARRT. This curriculum allows for faculty flexibility to meet the needs of the local community, yet satisfy the requirements for accreditation standards and the ARRT examination. It also offers a foundation for a transition to baccalaureate studies and, more importantly, for individual lifelong learning.

Radiography Curriculum

Table of Contents

Clinical Practice

Description
Content and clinical practice experiences should be designed to sequentially develop, apply, critically analyze, integrate, synthesize and evaluate concepts and theories in the performance of radiologic procedures. Through structured, sequential, competency-based clinical assignments, concepts of team practice, patient-centered clinical practice and professional development are discussed, examined and evaluated.

Clinical practice experiences should be designed to provide patient care and assessment, competent performance of radiologic imaging and total quality management. Levels of competency and outcomes measurement ensure the well-being of the patient preparatory to, during and following the radiologic procedure.

Content

I. Clinical Practice

A. Code of ethics/professional behavior
   1. Consistency, Accuracy, Responsibility and Excellence (CARE) in Medical Imaging and Radiation Therapy
   2. Incident reporting mechanisms
   3. Standards for supervision
      a. Direct
      b. Indirect
   4. The Patient Care Partnership: Understanding expectations, rights and responsibilities

B. Professional communication
   1. Patients
   2. Patient's family
   3. Health care team
   4. Confidentiality of patient records (Health Insurance Portability and Accountability Act, or HIPAA, compliance)

C. Radiographer Practice Standards
   1. Technical
   2. Professional
   3. Equipment operation
   4. Ability to adapt to varying clinical situations
   5. Emergency response
   6. Total quality management

D. Values
   1. Personal
      a. Values development
      b. Effect on medical care

c. Impact on patient care
d. Values clarification

2. Societal
   a. Rights and privileges
   b. Community values
   c. Impact on patient care
3. Professional
   a. Values development
   b. Values conflict
   c. Impact on patient care

E. Culture, ethnicity and diversity
   1. Societal and individual factors
   2. Socioeconomic
   3. Gender
   4. Age
      a. Infant
      b. Child
      c. Adolescent
      d. Adult
      e. Middle-aged
      f. Geriatric
   5. Family structure and dynamics
   6. Geographical factors
   7. Religion
   8. Lifestyle choices and behaviors
   9. Sexual orientation
   10. Disability

II. Procedural Performance

A. Scheduling and sequencing of exams

B. Order/requisition evaluation and corrective measures

C. Facilities setup

D. Patient assessment, clinical history, education and care
   1. Patient monitoring – emergency and nonemergency
      a. Vital signs
      b. Assessment and clinical history
      c. Equipment
      d. Patient emergencies
   2. Patient privacy and confidentiality
   3. Documentation and charting
   4. Infection control
   5. Patient education

a. Communication style
b. Age-specific
c. Cultural and socioeconomic sensitivity
d. Patient-focused care

6. Medical error reduction

E. Imaging
1. Positioning considerations
2. Technical considerations
3. Image acquisition
4. Image analysis

F. Radiation protection
1. Principles
2. Equipment and accessories

III. Clinical Competency

ARRT Competency Requirements (refer to the document located at www.arrt.org/pdfs/Disciplines/Competency-Requirements/RAD-Competency-Requirements-2012.pdf) *

*Refer to ARRT Competency Requirements for mandatory and elective requirements.

Digital Image Acquisition and Display

Description
Content imparts an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving and retrieval are discussed. Principles of digital system quality assurance and maintenance are presented.

Special Note: Digital imaging is a rapidly evolving technology. Every effort has been made to provide a curriculum outline that reflects, as accurately as possible, the state of the art of this discipline as of publication. Educators are encouraged to modify this outline with up-to-date information as it becomes available from vendors, clinical sites, textbooks, and technical representatives.

Content

I. Basic Principles of Digital Radiography

A. Digital image characteristics
   1. Picture elements – pixels
   2. Pixel size
   3. Matrix size
   4. Spatial resolution
   5. Bit depth
   6. Contrast resolution

B. Digital receptors
   1. Amorphous selenium/Thin film transistor (TFT) arrays
   2. Cesium iodide/amorphous silicon thin film transistor (TFT) arrays
   3. Charged coupled device (CCD) and complementary metal oxide semiconductor (CMOS) systems
   4. Photostimulable phosphor (PSP) plates

C. Comparison of detector properties and evaluative criteria
   1. Detective quantum efficiency (DQE)
   2. Exposure index
   3. Spatial resolution
      a. PSP
         1) Sampling frequency – pixel pitch
         2) Receptor size
         3) Light spread – phosphor layer thickness
      b. TFT detector element (DEL) size

D. Dynamic range and latitude
   1. Dynamic range of the detector
   2. Latitude – allowable error for optimal image acquisition
      a. Exposure latitude

b. Beam-part-receptor alignment latitude

II. Image Acquisition

A. Raw data acquisition
   1. Positioning
   2. Exposure field alignment and collimation
   3. Exposure – technique selection

B. Image formation
   1. Image extraction
      a. TFT, CMOS, CCD
      b. PSP plate scanned by laser
   2. Digitized by analog-to-digital converter (ADC)
   3. Exposure field recognition
   4. Histogram created and analyzed by software
   5. Initial image processing
      a. Exposure indicator determination
      b. Automatic rescaling
      c. Look-up table (LUT)
   6. Image enhancement processing
      a. Gradient processing
         1) Brightness
         2) Contrast
      b. Frequency processing
         1) Smoothing
         2) Edge enhancement
      c. Equalization

C. Exposure indicators
   1. Dose area product (DAP)
   2. Vendor-specific values
      a. Relationship to patient exposure
      b. Reader calibration
      c. Centering and beam collimation
      d. Optimal value ranges
   3. Exposure indicators

III. Image Acquisition Errors

A. Histogram analysis error
   1. Incorrect anatomic menu selection
   2. Exposure field recognition errors
      a. Collimation border recognition
      b. Exposure field distribution – multiple fields/plate
   3. Unexpected material in data set, e.g., metal
   4. Large overexposure error
   5. Inappropriate rescaling – dark or light image

B. Low intensity radiation response – PSP only
   1. Background
      a. Stores background exposure
         1) Plate responds to an exposure as low as 60 μR
         2) Background is 40 μR/day to 80 μR/day
      b. Plates unused for more than 48 hours should be erased
   2. Scatter no PSP storage in exam room

C. Scatter control
   1. Beam limitation
   2. Optimal exposure
   3. Grid use
      a. Kilovoltage peak (kVp)
      b. Grid cutoff
      c. Compare short dimension (SD) grid and long dimension (LD) grid
      d. Storage

IV. Fundamental Principles of Exposure

A. Optimal receptor exposure
   1. Milliampere-seconds (mAs)
   2. kVp
   3. Collimation
   4. Grid
   5. Source-to-image distance (SID)
   6. Speed class
   7. Fog

B. Exposure myths and misconceptions associated with digital systems

C. Control patient exposure
   1. Higher kVp levels
   2. Additional filtration
   3. Interfacing with automatic exposure control (AEC) systems
   4. As low as reasonably achievable (ALARA) principles

D. Monitor patient exposure
   1. Part of quality assurance (QA) program
   2. Vendor-supplied software

V. Image Evaluation

A. Evidence of appropriate exposure level (exposure indicator range)
   1. Exposure indicator range
   2. Noise
      a. Computer noise
      b. Electronic noise

c. Material mottle
d. Quantum mottle

B. Contrast

C. Recorded detail

D. Artifacts
1. Patient
2. Equipment
3. Exposure
4. Processing
5. Moiré effect

VI. Quality Assurance and Maintenance Issues

A. Technologist responsibilities
1. Image quality control
a. Exposure indicator appropriateness
b. Image accuracy
2. Plate maintenance
a. Cleaning and inspection
b. Erasure
3. Reject analysis

B. Service engineer or medical physicist responsibilities

VII. Display

A. Monitor
1. Plasma
2. Liquid crystal display (LCD)
3. Cathode ray tube (CRT)

B. Laser film

VIII. Data Management

A. Network

B. Hospital information system (HIS)

C. Radiology information system (RIS)

D. Picture archiving and communication system (PACS)
1. System components and functions
2. Emergency contingency plan
3. Digital imaging and communication in medicine (DICOM)
4. Teleradiography

5. Radiographer responsibilities
   a. Access work order (worklist)
   b. Postprocessing – image manipulation
   c. Annotation issues
   d. Transmitting images to PACS
   e. HIPAA
   f. Workflow

Ethics and Law in the Radiologic Sciences

Description
Content provides a foundation in ethics and law related to the practice of medical imaging. An introduction to terminology, concepts and principles will be presented. Students will examine a variety of ethical and legal issues found in clinical practice.

Content

I. Ethics and Ethical Behavior

A. Origins and history of medical ethics

B. Moral reasoning

C. Personal behavior standards

D. Competence

E. Professional attributes

F. Standards of practice

G. Self-assessment and self-governance

H. Code of professional ethics

I. Ethical concepts
   1. Ethical principles
   2. Violation process

J. Systematic analysis of ethical problems

II. Ethical Issues in Health Care

A. Individual and societal rights

B. Cultural considerations

C. Economical considerations

D. Technology and scarce resources

E. Access to quality health care

F. Human experimentation and research

G. End-of-life issues

H. Ethical research
   1. Institutional review board approval
   2. Data collection
   3. Data reporting

I. Radiology-specific
   1. Dose creep
   2. ALARA

III. Legal Issues

A. Parameters of legal responsibility

B. HIPAA
   1. Confidentiality of patient medical records (written and electronic)
   2. Electronic communication (e.g., cell phones, social networking sites, e-mail, photography)

C. Torts
   1. Intentional
   2. Unintentional

IV. Legal doctrines

A. Legal and professional standards

B. Medical records
   1. Accuracy of documentation
   2. Radiographic images as legal documents

C. Legal risk reduction/risk management

V. Patient Consent

A. Definition

B. Types

C. Condition for valid consent

D. Documentation of consent

E. Right of refusal

Human Structure and Function

Description
Content establishes a knowledge base in anatomy and physiology. Components of the cells, tissues, organs and systems are described and discussed. The fundamentals of sectional anatomy relative to routine radiography are addressed.

Content

I. Anatomical Nomenclature

A. Terms of direction
1. Anterior/posterior
2. Ventral/dorsal
3. Medial/lateral
4. Superior/inferior
5. Proximal/distal
6. Cephalad/caudad

B. Body planes
1. Median/midsagittal
2. Sagittal
3. Coronal
4. Transverse
5. Longitudinal

C. Body cavities – structural limits, function, contents
1. Cranial
2. Thoracic
3. Abdominal/pelvic

II. Chemical Composition

A. Atoms

B. Chemical bonds

C. Inorganic compounds
1. Acids
2. Bases
3. Salts
4. Acid-base balance
5. pH maintenance

D. Organic compounds
1. Carbohydrates
2. Lipids
3. Proteins

4. Nucleic acids
5. DNA
6. RNA
7. Adenosine triphosphate (ATP)
8. Cyclic adenosine 3', 5'-monophosphate (cyclic AMP)

III. Cell Structure and Genetic Control

A. Cell membrane
1. Chemistry
2. Structure
3. Physiology
4. Types of transport processes
   a. Diffusion
   b. Osmosis
   c. Filtration
   d. Active transport/physiological pumps
   e. Phagocytosis and pinocytosis

B. Cytoplasm

C. Organelles
1. Nucleus
2. Ribosomes
3. Endoplasmic reticulum
4. Golgi complex
5. Mitochondria
6. Lysosomes
7. Peroxisomes
8. Cytoskeleton
9. Centrosome and centrioles
10. Flagella and cilia

D. Gene action
1. Protein synthesis
2. Nucleic acid (RNA/DNA) synthesis
3. Transcription
4. Translation

E. Cell reproduction
1. Mitosis
2. Meiosis

F. Aberration/abnormal cell division

IV. Metabolism

A. Anabolism

B. Catabolism

C. Enzymes and metabolism

D. Carbohydrate metabolism

E. Lipid metabolism

F. Protein metabolism

G. Regulation and homeostasis

V. Tissues

A. Types of tissue
   1. Epithelial
   2. Connective
   3. Muscle
   4. Nerve

B. Tissue repair

VI. Skeletal System

A. Osseous tissue
   1. Structural organization
      a. Medullary cavity/marrow
      b. Compact bone
      c. Cancellous bone
      d. Periosteum
      e. Cartilage
   2. Development and growth
      a. Physis
      b. Diaphysis
      c. Diaphysis/epiphyseal line
      d. Metaphysis
   3. Classification and markings
      a. Long
      b. Short
      c. Flat
      d. Irregular
      e. Processes and bony projections
      f. Depressions/openings

B. Divisions
   1. Axial
      a. Skull

b. Hyoid bone
c. Vertebral column
d. Thorax

2. Appendicular
   a. Pectoral girdle
   b. Upper extremities
   c. Pelvic girdle
   d. Lower extremities
3. Sesamoids
4. Functions

C. Articulations
1. Types
   a. Synarthroses, fibrosis
   b. Amphiarthroses, cartilaginous
   c. Diarthroses, synovial
2. Movement

VII. Muscular System

A. Types and characteristics
1. Smooth
2. Cardiac
3. Skeletal

B. Functions

VIII. Nervous System

A. Neural tissue – structure and function
1. Neurons
2. Neuroglia

B. Central nervous system – structure and function
1. Brain and cranial nerves
2. Spinal cord

C. Peripheral nervous system – structure and function
1. Sympathetic nerves
2. Parasympathetic nerves

IX. Sensory System

A. General senses
1. Nociperception
2. Chemoreception
3. Thermoreception
4. Mechanoreception

B. Special senses – structure, function
   1. Vision
   2. Hearing and equilibrium
   3. Olfaction
   4. Gustation
   5. Tactile

X. Endocrine System

A. Primary organs - structure, function and location

B. Homeostatic control

C. Endocrine tissue and related hormones
   1. Pituitary (hypophysis) gland
   2. Pineal gland
   3. Thyroid gland
   4. Parathyroid gland
   5. Adrenal (suprarenal) glands
   6. Heart and kidneys
   7. Digestive system
   8. Pancreas
   9. Testes
   10. Ovaries
   11. Thymus
   12. Placenta

XI. Digestive System

A. Primary organs – structure, function and location
   1. Oral cavity
   2. Esophagus
   3. Stomach
   4. Small intestine
   5. Large intestine
   6. Rectum

B. Accessory organs – structure, function and location
   1. Salivary glands
   2. Pancreas
   3. Liver
   4. Gallbladder

C. Digestive processes
   1. Ingestion
   2. Peristalsis
   3. Digestion
   4. Absorption

5. Defecation

XII. Cardiovascular System

A. Blood
   1. Composition
   2. Clotting system
   3. Hemopoiesis
   4. Function

B. Heart and vessels
   1. Anatomy
   2. Function

C. Electrocardiogram (ECG) tracings correlated to normal cardiac rhythm

XIII. Lymphatic System and Immunity

A. Lymphatic system
   1. Lymph vessels
   2. Lymphatic organs
      a. Thymus
      b. Lymph nodes
      c. Spleen
   3. Lymphatic tissue
      a. Tonsils
      b. Peyer's patches

B. Immune system
   1. Nonspecific defenses
      a. Physical barriers
      b. Leukocytes
      c. Immunological surveillance
   2. B-cell response
      a. Production
      b. Types of immunoglobulins
      c. Function
      d. Regulation of B-cell response
   3. T-cell response
      a. Production
      b. Types
      c. Function
      d. Regulation of T-cell response
   4. Passive and active immunity

XIV. Respiratory System

A. Components, structure and function
   1. Nose and sinus cavities

2. Pharynx
3. Larynx
4. Trachea
5. Bronchi
6. Lungs
7. Thorax

B. Physiology
1. Pulmonary ventilation
2. Alveolar gas exchange
3. Transport of blood gases
4. Tissue gas exchange
5. Control and regulation of respiration

XV. Urinary System

A. Components, structure and function
1. Kidneys
2. Ureters
3. Bladder
4. Urethra

B. Urine
1. Physical characteristics
2. Chemical composition

C. Micturition

XVI. Reproductive System

A. Male – structure, function and location
1. External organs
2. Internal organs

B. Female – structure, function and location
1. External organs
2. Internal organs
3. Mammary glands

C. Reproductive physiology
1. Ovarian cycle
2. Menstrual cycle
3. Aging and menopause

XVII. Introduction to Sectional Anatomy

A. Structures and locations
1. Head/neck
a. Brain

b. Cranium
c. Major vessels

2. Thorax
   a. Mediastinum
   b. Lung
   c. Heart
   d. Airway
   e. Major vessels
3. Abdomen
   a. Liver
   b. Biliary
   c. Spleen
   d. Pancreas
   e. Kidneys/ureters
   f. Peritoneum
   g. Retroperitoneum
   h. Gastrointestinal (GI) tract
   i. Major vessels

Image Analysis

Description
Content provides a basis for analyzing radiographic images. Included are the importance of optimal imaging standards, discussion of a problem-solving technique for image evaluation and the factors that can affect image quality. Actual images will be included for analysis.

Content

I. Image Appearance Standards
- A. Establishing appearance standards
  1. Exam demands
  2. Visual acuity/perception
  3. Image viewing conditions
  4. Radiologist preferences and demands
- B. Maintaining appearance standards-QA program

II. Imaging Standards
- A. Purpose
- B. Problem-solving process
- C. Role of the radiographer
  1. Determining cause of problems
  2. Recommending corrective action
- D. Establishing acceptable limits

III. Image Appearance Characteristics
- A. Brightness/density (film)
  1. Exposure to image receptor
  2. Brightness on display monitor
- B. Contrast
  1. Subject
  2. Image
- C. Recorded detail/spatial resolution
  1. Motion
  2. Geometric
  3. Receptor
  4. Noise
- D. Distortion
  1. Shape

2. Size
3. Spatial

IV. Procedural Factors

A. Image identification
1. Patient information
2. Date of examination
3. Proper use of identification markers
4. Institutional data

B. Documentation of ordered exam
1. Order types
   a. Written orders
   b. Verbal orders
   c. Electronic orders
2. Order appropriateness

C. Positioning
1. Anatomical considerations
   a. Anatomy of interest
   b. Plane/baseline reference
   c. Central ray angulation
   d. Anatomical variations
   e. Body habitus
   f. Pathology
2. Positioning aids
3. Special concerns
   a. Age
   b. Patient condition
   c. Mobile radiography

D. Centering
1. Central ray location
2. Area of interest
3. Beam alignment and angulation

E. Exposure indicator appropriateness

F. Radiation protection
1. Collimation/beam limitation
2. Shielding
3. Repeats

G. Patient preparation
1. Contrast agents
2. Pre-examination preparation

H. Artifacts

V. Corrective Action

A. Equipment

B. Technical factors

C. Procedural factors

D. Artifacts

Imaging Equipment

Description
Content establishes a knowledge base in radiographic, fluoroscopic and mobile equipment requirements and design. The content also provides a basic knowledge of quality control.

Content

I. X-ray Circuit

A. Electricity
   1. Potential difference
   2. Current
      a. Direct
      b. Alternating
   3. Resistance

B. Protective devices
   1. Ground
   2. Circuit breaker

C. Transformers
   1. Step-up
   2. Step-down
   3. Auto transformer

D. Components and functions
   1. Filament circuit
   2. Tube circuit

E. Rectification
   1. Purpose
   2. Mechanisms

F. Generator types
   1. Single phase
   2. High frequency (single and three phase)
      a. Constant load – constant mA
      b. Falling load – decreasing mA with time

II. Radiographic Equipment

A. Permanent installation
   1. Tubes
   2. Collimators
   3. Tables
   4. Control panels
   5. Tube stands

6. Wall units
7. Equipment manipulation

B. Mobile units
1. Components
2. Purpose
3. Applications

C. Automatic exposure control (AEC) devices
1. Ionization chambers
2. Solid state detector
3. Minimum response time
4. Backup time
5. Alignment/positioning considerations
   a. Cell locations
   b. Cell size
   c. Cell sensitivity/balance
6. Compensation issues
   a. Patient size
   b. Pathology/metal
   c. Field size
   d. Image receptor variations

III. Diagnostic X-Ray Tubes

A. Construction

B. Extending tube life
1. Warm-up procedures
2. Rotor considerations
3. Filament considerations
4. Single exposure limits
5. Multiple exposure limits
6. Anode thermal capacity
7. Tube movement

IV. Image-Intensified Fluoroscopy

A. Construction

B. Intensification principles/characteristics
1. Brightness gain
2. Flux gain
3. Minification gain
4. Automatic brightness control (ABC)
5. Multi-field intensifiers
   a. Magnification
   b. Dose

6. Spatial resolution
7. Contrast
8. Distortion
9. Noise

C. Viewing systems
   1. Video camera tube
   2. CCD
   3. CRT/LCD/flat screen monitor

D. Digital fluoroscopy
   1. Types of acquisition
   2. Operations and technique

V. Quality Control

A. Elements
   1. Standards for quality – agencies
   2. Communications
   3. Quality management manual
   4. Responsibility and administration
   5. Test equipment, procedures and training
   6. Record-keeping
   7. Test review
   8. Evaluation
   9. Continuing education

B. Equipment
   1. kVp/half-value layer (HVL)
   2. Milliampere
      a. mAs reciprocity
      b. mA linearity
   3. Timer accuracy
   4. Image receptors
   5. Beam alignment
   6. Collimator accuracy
   7. Illuminator brightness/consistency
   8. Monitor calibration

VI. Modality Exploration and Radiation Therapy

A. Magnetic resonance (MR) imaging, nuclear medicine, ultrasonography, mammography, bone densitometry, interventional radiography
   1. Basic principles of operation
   2. Image data presentation/appearance
   3. Education and certification

B. Radiation therapy

1. Basic principles of treatment delivery (external beam, brachytherapy)
2. Image data presentation/appearance
3. Education and certification

Introduction to Computed Tomography

Description
Content is designed to provide entry-level radiography students with an introduction to and basic understanding of the operation of a computed tomography (CT) device. Content is not intended to result in clinical competency.

Content

I. Components, Operations and Processes
- A. Data acquisition
  - 1. Methods
    - a. Slice-by-slice
    - b. Volumetric
  - 2. Elements
    - a. Beam geometry
      - 1) Parallel
      - 2) Fan
      - 3) Spiral
  - 3. Data acquisition system (DAS)
    - a. Components
      - 1) Tube
      - 2) Detectors
      - 3) Filters
      - 4) Collimators
      - 5) ADC
    - b. Functions
      - 1) Measurement of transmitted beam
      - 2) Data transmission to computer
  - 4. Data acquisition process
    - a. Scanning/raw data/image data
      - 1) Rays
      - 2) Views
      - 3) Profiles
        - a) Pixels
        - b) Matrices
        - c) Voxels
    - b. Attenuation
      - 1) Linear attenuation coefficients
      - 2) CT numbers (Hounsfield numbers)
        - a) Baseline reference numbers
          - i) Water equal to 0
          - ii) Bone (white) equal to 400 to 1000 HU
          - iii) Air (black) equal to -1000 HU
    - c. Selectable scan factors
      - 1) Scan field of view

2) Display field of view
3) Matrix size
4) Slice thickness
5) Algorithm
6) Scan time and rotational arc
7) Radiographic tube output
8) Region of interest (ROI)
9) Magnification
10) Focal spot size and tube geometry

B. Factors controlling image appearance

C. Anatomical structures
1. Artifacts
2. Contrast resolution (window width)
3. Grayscale manipulation (window level)
4. Distortion
5. Noise
6. Spatial resolution

II. Radiation Protection

A. Methods for reducing radiation dose to the patient
1. Technical factor selection
2. Technical adjustments for children
3. Scatter radiation reduction

B. Reducing the radiographer's exposure to scatter radiation

C. Measurement units in CT
1. CT dose index (CTDI)
2. Multiple scan average dose (MSAD)
3. Dose length product (DLP)

D. CT immobilization devices
1. Straps
2. Head holders
4. IV arm boards

Introduction to Radiologic Science and Health Care

Description
Content provides an overview of the foundations of radiography and the practitioner's role in the health care delivery system. Principles, practices and policies of health care organizations are examined and discussed in addition to the professional responsibilities of the radiographer.

Content

I. The Health Science Professions
- A. Radiologic technology
  1. Radiography disciplines
     a. Diagnostic radiography
     b. Computed tomography
     c. Mammography
     d. Cardiac-interventional radiography
     e. Vascular-interventional radiography
     f. Bone densitometry
     g. Quality management
     h. Radiologist assistant
  2. Radiation therapy
  3. Nuclear medicine technology
  4. Multiskilled (fusion technology)
  5. Diagnostic medical sonography
  6. MR imaging
  7. PACS administration/informatics
  8. Education
  9. Management

- B. Other health care professions

II. The Health Care Environment
- A. Health care settings
  1. Hospitals
  2. Clinics
  3. Mental health facilities
  4. Long-term/residential facilities
  5. Hospice
  6. Outpatient/ambulatory care
  7. Preventive care
  8. Home health care
  9. Telemedicine

- B. Payment/reimbursement systems
  1. Self-pay
  2. Insurance

3. Government programs

III. Quality Management

A. Quality improvement/management

B. Quality assurance

C. Quality control

D. Benefits within radiology
   1. Patient safety
   2. Reduction in radiation exposure
   3. Efficacy of patient care
   4. Departmental efficiency
   5. Consistent image quality
   6. Cost-effectiveness

IV. Hospital Organization

A. Philosophy

B. Mission

C. Administrative services
   1. Governing board
   2. Hospital administration
   3. Admissions
   4. Information systems
   5. Procurement
   6. Accounting
   7. Support services
   8. Human resources

D. Medical services
   1. Physicians
   2. Clinical services
   3. Clinical support services

V. Radiology Organization

A. Professional personnel
   1. Administrators/managers
   2. Radiologists
   3. Radiographers
   4. Radiologist assistants
   5. Radiology nurses
   6. Radiation physicists

B. Support personnel
   1. Information systems staff
   2. Clerical staff

C. Educational personnel
   1. Program director
   2. Clinical coordinator
   3. Didactic instructor
   4. Clinical instructor
   5. Clinical staff

VI. Accreditation

A. Health care institutions

B. Modalities

C. Educational
   1. Programmatic accreditation (e.g., Joint Review Committee on Education in Radiologic Technology [JRCERT])
   2. Regional
   3. Other

VII. Regulatory Agencies

A. Federal

B. State

VIII. Professional Credentialing

A. Certification

B. Registration

C. Licensure

D. Agencies
   1. National
   2. State

IX. Professional Organizations

A. Purpose, function, activities

B. Types
   1. Local
   2. State
   3. National
   4. International

5. Other

X. Professional Development and Advancement

A. Continuing education

B. Clinical experience requirements

C. Continued qualifications

D. Continuing education opportunities
   1. Postprimary certification
   2. Collegiate/educational programs
   3. Self-learning activities
   4. Professional conferences

E. Employment considerations
   1. Geographic mobility
   2. Economic factors
   3. Workforce needs

F. Advancement opportunities
   1. Education
   2. Administration
   3. Advanced practice
   4. Physics
   5. Research
   6. Industrial
   7. Medical informatics
   8. Sales/applications

Medical Terminology

Description
Content provides an introduction to the origins of medical terminology. A word-building system is introduced and abbreviations and symbols are discussed. Also introduced is an orientation to understanding radiographic orders and diagnostic report interpretation. Related terminology is addressed.

Content

I. The Word-building Process
- A. Basic elements
  1. Root words
  2. Prefixes
  3. Suffixes
  4. Combination forms
- B. Parts of speech
  1. Nouns
  2. Verbs
  3. Adjectives
  4. Adverbs
- C. Translation of terms into common language
- D. Correct pronunciation of medical terms

II. Medical Abbreviations and Symbols
- A. Role in communications
- B. Abbreviations
  1. Examples
  2. Interpretations
- C. Pharmaceutical symbols and terms

III. Radiologic Technology Procedures and Terminology
- A. Radiography and other imaging modalities
- B. Radiation oncology

IV. Understanding Orders, Requests and Diagnostic Reports
- A. Radiographic orders and requisitions – components
  1. Procedures ordered
  2. Patient history
  3. Clinical information

B. Diagnostic reports
   1. Content
   2. Interpretation

Patient Care in Radiologic Sciences

Description
Content provides the concepts of optimal patient care, including consideration for the physical and psychological needs of the patient and family. Routine and emergency patient care procedures are described, as well as infection control procedures using standard precautions. The role of the radiographer in patient education is identified.

Content

I. Health Care Team

A. Responsibilities of the health care facility
   1. Caring for all patients regardless of condition
   2. Promoting health
   3. Preventing illness
   4. Education
   5. Research

B. Members and responsibilities

C. Responsibilities of the radiographer
   1. Performing radiographic examination
   2. Performing patient care and assessment
   3. Adhering to radiation protection guidelines
   4. Following practice standards
   5. Assisting the radiologist

II. Professionalism and Communication in Patient Care

A. Health and illness continuum

B. Developing professional attitudes
   1. Teamwork
   2. Work ethic
   3. Health role model
   4. Sympathy
   5. Empathy
   6. Assertiveness

C. Age- and generation-specific communication
   1. Neonatal
   2. Pediatric
   3. Adolescence
   4. Young adulthood
   5. Middle adulthood
   6. Geriatric

D. Communication
   1. Verbal
   2. Nonverbal communication
   3. Language/cultural variations
      a. Challenges
      b. Hearing, vision and speech impairments
      c. Impaired mental function
      d. Altered states of consciousness
      e. Human diversity
      f. Artificial speech
   4. Other factors that impede communication
      a. Colloquialism/slang
      b. Medical terminology
   5. Patient interactions
      a. Eye contact
      b. Volume and speed of speech
      c. Effective listening
      d. Feedback
   6. Communication with families
   7. Communication with other health care professionals

E. Psychological considerations
   1. Dying and death
      a. Understanding the process
      b. Aspects of death
         1) Emotional
         2) Personal
         3) Physical
      c. Stages of grief
         1) Denial
         2) Anger
         3) Bargaining
         4) Depression
         5) Acceptance
      d. Patient support services
         1) Family/friends
         2) Pastoral care
         3) Patient-to-patient support groups
         4) Psychological support groups
         5) Hospice
         6) Home care
   2. Factors affecting patient's emotional responses
      a. Age
      b. Gender
      c. Marital/family status
      d. Socioeconomic factors

e. Cultural/religious variations
f. Physical condition
g. Self-image
h. Past health care experiences
i. Beliefs
j. Attitudes
k. Prejudices
l. Self-awareness

III. Patient/Radiographer Interactions

A. Patient identification methods
1. Interviewing/questioning
2. Chart/requisition
3. Wrist band
4. Institution-specific

B. Procedure questions and explanations
1. Positioning
2. Length of procedure
3. Immobilization devices
4. Machine movement/sounds

C. Interaction with patient's family members and friends

IV. Safety and Transfer Positioning

A. Environmental safety
1. Fire
2. Electrical
3. Hazardous materials
4. Radioactive materials
5. Personal belongings
6. Occupational Safety and Health Administration (OSHA)
7. Environmental Protection Agency (EPA)

B. Body mechanics
1. Proper body alignment
2. Proper movement

C. Patient transfer and movement
1. Assess the patient's mobility
2. Rules for safe patient transfer
3. Wheelchair transfers
4. Stretcher transfers
a. Sheet transfer
b. Three-carrier lift
c. Log roll

d. Positioning for safety, comfort or exams
e. Transfer devices

D. Fall prevention

E. Patient Positions
1. Supine
2. Prone
3. Decubitus
4. Oblique
5. Fowler's
6. Semi-Fowler's
7. Sims'
8. Trendelenburg
9. Lithotomy

F. Safety and immobilization
1. Types
2. Applications
3. Devices
a. Adult
b. Pediatric

G. MR Safety
1. Pacemakers and other implanted devices
2. Aneurysm clips
3. O_2 containers

H. Incident reporting
1. Legal considerations
2. Documentation
3. Procedures

V. Evaluating Physical Needs

A. Assess patient status
1. Evaluation methodology
2. Clinical information

B. Vital signs – ranges and values
1. Temperature
2. Pulse
3. Respiration
4. Blood pressure
5. Normal values
6. Interfering factors
7. Terminology

8. Adult vs. pediatric
9. Documentation
10. Pain assessment
11. Body type

C. Acquiring and recording vital signs
   1. Procedures
   2. Demonstration

D. Normal ranges of laboratory data
   1. Blood urea nitrogen (BUN)
   2. Creatinine
   3. Glomerular filtration rate (GFR)
   4. Hemoglobin
   5. Red blood cells (RBCs)
   6. Platelets
   7. Oxygen (O_2) saturation
   8. Prothrombin
   9. Partial thromboplastin time

E. Patient chart (paper and electronic)
   1. Aspects of patient chart
   2. Retrieval of specific information
   3. Proper documentation in the chart

VI. Infection Control

A. Terminology
   1. Hospital acquired
   2. Communicable
   3. Infectious pathogens
   4. Human immunodeficiency virus (HIV)
   5. Hepatitis
   6. Multidrug-resistant organisms (MDRO)
   7. Other

B. Centers for Disease Control and Prevention (CDC)
   1. Purpose
   2. Publications and bulletins

C. Cycle of infection
   1. Infectious pathogens – bloodborne and airborne
   2. Reservoir of infection
   3. Susceptible host
   4. Transmission of disease
      a. Direct
      b. Indirect

D. Prevent disease transmission
   1. Transmission-based precautions
   2. Health care worker
      a. Immunization
      b. Booster
      c. Post-exposure protocols

E. Asepsis
   1. Medical
      a. Hand washing
      b. Chemical disinfectants
   2. Surgical
      a. Growth requirements for microorganisms
      b. Methods used to control microorganisms
         1) Moist heat
         2) Dry heat
         3) Gas
         4) Chemicals
      c. Procedures
         1) Opening packs
         2) Gowning/gloving
         3) Skin preparation
         4) Draping
         5) Dressing changes
      d. Packing
      e. Storage
      f. Linen

F. Isolation techniques and communicable diseases
   1. Category-specific
   2. Disease-specific
   3. Standard precautions

G. Isolation patient in radiology department
   1. Procedure
      a. Gowning
      b. Gloving
      c. Masking
   2. Patient transfer
   3. Cleaning and proper disposal of contaminated waste
   4. Cleaning image receptors and imaging equipment

H. Precautions for the compromised patient (reverse isolation)
   1. Purpose
   2. Procedure

I. Psychological considerations

VII. Medical Emergencies

A. Terminology

B. Emergency equipment

C. Latex reactions

D. Shock
   1. Signs and symptoms
   2. Types
      a. Hypovolemic
         1) Hemorrhage
         2) Plasma loss
         3) Drugs
      b. Disruptive
         1) Anaphylactic
         2) Neurogenic
         3) Septic
      c. Cardiogenic
   3. Medical intervention

E. Diabetic emergencies – signs, symptoms and interventions
   1. Hypoglycemia
   2. Ketoacidosis
   3. Hyperosmolar coma

F. Respiratory and cardiac failure – signs, symptoms and interventions
   1. Adult vs. pediatric
   2. Equipment

G. Airway obstruction – signs, symptoms and interventions

H. Cerebral vascular accident (stroke) – signs, symptoms and interventions

I. Fainting and convulsive seizures – signs, symptoms and interventions
   1. Types
      a. Nonconvulsive (petit mal)
      b. Convulsive (grand mal)
   2. Reasons for fainting

J. Other medical conditions
   1. Epistaxis
   2. Nausea
   3. Postural hypotension

4. Vertigo
5. Asthma

VIII. Trauma

A. Head injuries
   1. Four levels of consciousness
   2. Symptoms
   3. Medical intervention

B. Spinal injuries
   1. Assessment
   2. Symptoms
   3. Medical intervention
   4. Transportation

C. Extremity fractures
   1. Types
   2. Symptoms
   3. Orthopedic devices
   4. Positioning

D. Wounds
   1. Symptoms
   2. Medical intervention

E. Burns
   1. Classifications
   2. Medical intervention

IX. Contrast Studies

A. Patient education
   1. Radiographer's responsibility
   2. Standard procedure

B. Patient preparation and care per procedure

C. Follow-up care
   1. Post exam
   2. Infiltrate

X. Reactions to Contrast Agents

A. Signs and symptoms

B. Medical intervention

C. Vasovagal reactions

XI. Tubes, Catheters, Lines and Other Devices

A. Terminology

B. Function of devices

C. Nasogastric/nasointestinal

D. Suction
   1. Adult vs. pediatric
   2. Special precautions

E. Tracheostomy
   1. Suction techniques
   2. Cardiopulmonary resuscitation (CPR) with tracheostomy

F. Chest (thoracostomy) tube
   1. Purpose
   2. Location

G. Implanted devices (pacemakers)
   1. Purpose
   2. Location

H. Greenfield filter (IVC filter)
   1. Purpose
   2. Location

I. Peripheral venous lines
   1. Purpose
   2. Location

J. Central venous lines
   1. Purpose
   2. Types
   3. Access

K. Tissue drains

L. Oxygen administration
   1. Values
   2. Oxygen therapy
   3. Oxygen delivery systems
      a. Low-flow systems
      b. High-flow systems
   4. Documentation

5. Special precautions

M. Urinary collection
   1. Procedure
      a. Male
      b. Female
   2. Alternative methods of urinary drainage
   3. Documentation

N. Ostomies
   1. Ileostomy
   2. Ureteroileostomy

XII. Mobile and Surgical Radiography

A. Prior to bedside procedure:
   1. Verify order
   2. Right patient – right procedure

B. Steps followed during bedside procedure

C. Bedside procedure for neonate

D. Bedside procedure for the orthopedic patient

E. Special situations

F. Radiography in surgery
   1. Surgical clothing
   2. Equipment preparation
   3. Sterile fields
   4. Communication skills

G. Radiation protection
   1. Patient
   2. Radiographer
   3. Other

Pharmacology and Venipuncture

Description
Content provides basic concepts of pharmacology, venipuncture and administration of diagnostic contrast agents and intravenous medications. The appropriate delivery of patient care during these procedures is emphasized.

Considerations
Students should successfully complete patient care objectives (including CPR and basic life support (BLS) certification), as well as objectives related to the anatomy and physiology of the circulatory and excretory systems, prior to introducing this educational content.

Though regulations regarding the administration of contrast media and intravenous medications vary between states and institutions, the official position of the American Society of Radiologic Technologists is that venipuncture falls within the radiologic technology profession's general scope of practice and practice standards. Therefore, it should be included in the didactic and clinical curriculum included with demonstrated competencies in all appropriate disciplines regardless of the state or institution where the curriculum is taught.

In states or institutions where students are permitted to perform intravenous injections, the program has specific ethical and legal responsibilities to the patient and the student. The student shall be assured that:

- Legal statutes allow student radiographers to perform venipuncture.
- Professional liability coverage is adequate.
- Adequate supervision is provided.
- Appropriate, structured laboratory objectives are identified.
- Evaluation and demonstration of competency occur before venipuncture is performed unsupervised.

Content

I. Drug Nomenclature
- A. Chemical name
- B. Generic name
- C. Trade name

II. Methods of Drug Classification
- A. Chemical group
- B. Mechanism/site of action
- C. Primary effect

III. **General Pharmacologic Principles**
   A. Pharmacokinetics
   B. Pharmacodynamics

IV. **Six Rights of Drug Safety**
   A. The right medication
   B. The right dose
   C. The right patient
   D. The right time
   E. The right location
   F. The right documentation

V. **Drug Categories of Relevance to Radiography (Uses and Impacts on Patient)**
   A. Analgesics
   B. Anesthetic agents
   C. Antiallergic and antihistamine drugs
   D. Antianxiety drugs
   E. Antiarrhythmic drugs
   F. Antibacterial drugs
   G. Anticoagulant and coagulant drugs
   H. Antidepressants
   I. Antiemetic drugs
   J. Antihypertensive drugs
   K. Anti-inflammatory drugs
   L. Antiseptic and disinfectant agents
   M. Bronchodilators
   N. Cathartic and antidiarrheal drugs

O. Diuretics

P. Sedative and hypotonic drugs

Q. Vasodilators and vasoconstrictors

VI. Contrast Agents

A. Types of compound
   1. Metallic salts
   2. Organic iodides
      a. Ionic contrast agents
      b. Nonionic contrast agents
   3. Gaseous

B. Beam attenuation characteristics
   1. Radiolucent (negative)
   2. Radiopaque (positive)
   3. Impact of atomic number

C. Pharmacologic profile of contrast agents
   1. Chemical composition
   2. Absorption characteristics
   3. Distribution characteristics
   4. Metabolic characteristics
   5. Elimination characteristics
   6. Indications, actions and effects
   7. Interactions and contraindications
   8. Patient reactions

D. Dosage

E. Preparation

VII. Routes of Drug Administration

A. Systemic
   1. Oral
   2. Rectal
   3. Tube/catheter
   4. Inhalation

B. Parenteral
   1. Intravenous
   2. Intra-arterial
   3. Intrathecal

VIII. Venipuncture

A. Methods
   1. Continuous infusion
   2. Intermittent infusion
   3. Direct injection
      a. Hand injection
      b. Mechanical pressure injector

B. Sites of administration
   1. Peripheral
   2. Central

C. Complications
   1. Infiltration
   2. Extravasation
   3. Phlebitis
   4. Air embolism
   5. Drug incompatibility
   6. Low fluid level in container

D. Venipuncture procedures
   1. Equipment
   2. Patient identification, assessment and instructions
   3. Informed consent
   4. Dosage, dose calculations and dose-response
      a. Adults
      b. Pediatric patients
   5. Patient preparation
   6. Application of standard precautions
   7. Procedure
      a. Injection through an existing line
      b. Venipuncture
   8. Site observation
   9. Emergency medical treatment procedure
      a. Appropriate codes
      b. Emergency cart (crash cart)
      c. Emergency medications
      d. Accessory equipment
         1) Oxygen
         2) Suction
      e. Emergency medical treatment follow-up tasks
   10. Discontinuation
      a. Equipment/supplies for withdrawal
      b. Patient preparation
      c. Application of standard precautions
      d. Withdrawal procedure

e. Site observation
f. Patient observation
g. Postprocedural tasks

11. Documentation of administration
12. Documentation of complication/reaction

IX. Current Practice Status

A. Professional standards
1. Scope of practice
2. Practice standards
3. Professional liability and negligence

B. State statutes

C. Employer prerogative

Principles of Imaging

Description
Content establishes a knowledge base in factors that govern the image production process.

Content

I. Exposure Factors
- A. Distance
- B. mAs
- C. kVp
- D. Grids
- E. Receptor speed

II. Brightness Digital Display/Density (Film)
- A. Exposure to image receptor
- B. Calculations for receptor exposure maintenance
  1. Reciprocity law
  2. 15 percent rule
  3. Grid factor/Bucky factor
  4. Speed class
  5. SID

III. Contrast
- A. Description
  1. High/short gray scale
  2. Low/long gray scale
- B. Components
  1. Subject contrast – variation in receptor exposure
     a. Structural distribution – anatomical contrast
        1) Contrast media
        2) Pathology
     b. Beam quality
        1) kVp
        2) Filtration
     c. Scatter control
        1) Beam limitation
        2) Grid
        3) Air gap
  2. Image receptor contrast

3. Display contrast
    a. Brightness
    b. Ambient light in view area
    c. Window width and level

IV. Recorded Detail/Spatial Resolution

A. Factors affecting recorded detail/spatial resolution
1. Motion
    a. Part
    b. Equipment
2. Geometric
    a. Blur width, geometric unsharpness, edge gradient
        1) Focal spot size
        2) SID
        3) Object-to-image distance (OID)
3. Receptor
    a. Spatial resolution
    b. Light diffusion
4. Noise/mottle

V. Distortion

A. Types
1. Shape
    a. Foreshortening
    b. Elongation
2. Size – geometric magnification

B. Factors
    a. Distance
    b. Tube/part/image receptor relationships

VI. Exposure Latitude

A. Factors affecting exposure latitude
1. kVp
2. Image receptor

VII. Beam-limiting Devices

A. Function/Purpose
1. Reduce irradiated tissue volume
2. Reduce patient effective dose
3. Improve contrast

B. Types – applications
1. Cylinders
2. Collimator
3. Lead masks

4. Alignment

VIII. Beam Filtration

A. Types
   1. Inherent
   2. Added
   3. Flat
   4. Compound

B. Function/mechanism

C. Compensating filtration

D. Impact of filtration on image characteristics

E. Filtration vs. HVL

IX. Scattered and Secondary Radiation

A. Factors
   1. kVp
   2. Contrast agent
   3. Patient
   4. Beam limitation
   5. Grids
   6. OID – air gap technique

B. Effects
   1. Effective patient dose
   2. Subject contrast
   3. Image quality
   4. Occupational exposure

X. Grids

A. Function/mechanism

B. Construction

C. Types
   1. Focused
   2. Parallel
   3. Linear
   4. Crossed
   5. Moving
   6. Stationary
   7. Short dimension
   8. Long dimension

D. Characteristics
   1. Focal distance/radius
   2. Focal range
   3. Ratio
   4. Frequency
   5. Lead content
   6. Grid/Bucky factor
   7. Contrast improvement factor
   8. Selectivity

E. Selection
   1. kVp
   2. Patient/exam
   3. Beam limiting
   4. Alignment latitude

F. Primary cutoff

XI. Exposure Factor Formulation

A. Purpose
   1. Receptor exposure standardization
   2. Image consistency

B. Considerations
   1. Choice of technique system
   2. Patient thickness
   3. Image processing

C. Types
   1. Optimum kVp/variable mAs
   2. Variable kVp/fixed mAs
   3. Automated exposure
   4. Anatomically programmed radiography

Radiation Biology

Description
Content provides an overview of the principles of the interaction of radiation with living systems. Radiation effects on molecules, cells, tissues and the body as a whole are presented. Factors affecting biological response are presented, including acute and chronic effects of radiation.

Content

I. Introduction

A. Molecule
   1. Ionic bond
   2. Covalent bond

B. Basic cellular biology
   1. Cellular structure
      a. Cell membrane
      b. Cytoplasm
      c. Protoplasm
      d. Organelles
      e. Nucleus
   2. Cellular function
      a. Basic cell chemistry
      b. Metabolism
      c. Organic and inorganic compounds
   3. Cell proliferation
      a. Cell cycle
      b. Mitosis
      c. Meiosis
      d. Differentiation

C. Types of ionizing radiation
   1. Electromagnetic radiation
      a. X-rays
      b. Gamma rays
   2. Particulate radiations
      a. Alpha
      b. Beta
         1) Negatron
         2) Positron
      c. Neutrons
      d. Protons

D. Sources of medical radiation exposure
   1. Diagnostic radiology

2. Dental radiology
3. Cardiovascular-interventional radiology
4. Nuclear medicine
5. Radiation oncology

E. Other sources of radiation exposure

II. Radiation Energy Transfer

A. Molecular effects of radiation
1. Direct effect
a. Target theory
1) Target molecules
2) Cell death
2. Indirect effect
a. Radiolysis of water

B. Factors effecting energy transfer
1. Linear energy transfer (LET)
2. Relative biological effectiveness (RBE)
3. Factors influencing RBE
a. LET
b. Oxygen effect

III. Radiation Effects

A. Subcellular radiation effects
1. Radiation effects on DNA
a. Types of damage
b. Implications for humans
2. Radiation effects of chromosomes
a. Types of damage
b. Implications for humans

B. Cellular radiation effects
1. Types of cell death
a. Interphase death
b. Mitotic (genetic) death
2. Other effects
a. Mitotic delay
b. Reproductive failure
c. Interference of function

C. Individual radiation effects
1. Somatic effects
a. Short-term
b. Long-term
c. Stochastic (probabilistic) effects

d. Nonstochastic (deterministic) effects
2. Genetic effects
   a. Mutagenesis
   b. Genetically significant dose (GSD)
3. Embryo and fetal effects

D. Factors influencing radiation response

IV. Radiosensitivity and Response

A. Law of Bergonié and Tribondeau
1. Differentiation
2. Mitotic rate
3. Metabolic rate

B. Cell survival and recovery
1. Factors influencing survival
   a. LET
   b. Oxygen enhancement ratio (OER)
   c. Fractionation
   d. Protraction
2. Lethal dose (LD)

C. Systemic response to radiation
1. Hemopoietic
2. Integumentary
3. Digestive
4. Urinary
5. Respiratory
6. Reproductive
7. Muscle
8. Nervous
9. Other

D. Radiation dose-response curves
1. Linear, nonthreshold
2. Nonlinear, nonthreshold
3. Linear, threshold
4. Nonlinear, threshold

E. Total body irradiation
1. Acute radiation syndrome
   a. Hemopoietic
   b. Gastrointestinal
   c. Central nervous system
2. Stages of response and dose levels
3. Factors that influence response

4. Medical interventions of response

F. Late effects of radiation
   1. Somatic responses
      a. Mutagenesis
      b. Carcinogenesis
   2. Stochastic (probabilistic) effects
   3. Non-stochastic (deterministic) effects
   4. Genetic effects
   5. Occupational risks for radiation workers

G. Risk estimates

Radiation Production and Characteristics

Description
Content establishes a basic knowledge of atomic structure and terminology. Also presented are the nature and characteristics of radiation, x-ray production and the fundamentals of photon interactions with matter.

Content

I. Structure of the Atom
- A. Composition
  1. Nucleus
  2. Structure – proton and electron balance
  3. Electron shells
     a. Binding energy
     b. Valence shell
     c. Ionization
     d. Excitation
- B. Nomenclature
  1. Atomic number
  2. Mass number

II. Nature of Radiation
- A. Radiation
  1. Electromagnetic
     a. Spectrum
     b. Wave-particle duality
     c. Properties
  2. Particulate
     a. Types
     b. Characteristics
  3. Nonionizing (excitation) vs. ionizing
     a. Energy
     b. Probability
- B. Radioactivity
  1. Radioactive decay
     a. Alpha emission
     b. Beta emission
     c. Gamma emission
  2. Half-life ($T_{½}$)

III. X-Ray Production
- A. Historical introduction

B. Target interactions
   1. Bremsstrahlung
   2. Characteristic
   3. Percentage relationship with energy

C. Common terms related to the x-ray beam
   1. Primary beam
   2. Exit/remnant beam
   3. Leakage radiation
   4. Off-focus/stem radiation

D. Conditions necessary for x-ray production
   1. Source of electrons
   2. Acceleration of electrons
   3. Focusing the electron stream
   4. Deceleration of electrons

E. X-ray emission spectra
   1. Continuous spectrum
   2. Discrete spectrum
   3. Minimum wavelength

F. Factors that affect emission spectra
   1. kVp
   2. mA
   3. Time
   4. Atomic number of target
   5. Distance
   6. Filtration
   7. Voltage waveform

G. Efficiency in production
   1. Description
   2. Frequency and wavelength

IV. Interaction of Photons with Matter

A. Transmission of photons
   1. Attenuated radiation
   2. Exit/remnant radiation

B. Unmodified scattering (coherent)

C. Photoelectric effect
   1. Description of interaction
   2. Relation to atomic number
   3. Energy of incident photon and resulting product

4. Probability of occurrence
    a. Atomic number
    b. Photon energy
    c. Part density
5. Application

D. Modified scattering (Compton)
1. Description of interaction
2. Relation to electron density
3. Energy
4. Probability of occurrence

E. Pair production

F. Photodisintegration

Radiation Protection

Description
Content presents an overview of the principles of radiation protection, including the responsibilities of the radiographer for patients, personnel and the public. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies and health care organizations are incorporated.

Content

I. Introduction
- A. Justification for radiation protection
  1. Somatic effects
  2. Genetic effects
- B. Potential biological damage of ionizing radiation
  1. Stochastic (probabilistic) effects
  2. Nonstochastic (deterministic) effects
- C. Objectives of a radiation protection program
  1. Documentation
  2. Occupational and nonoccupational dose limits
  3. ALARA concept (optimization)
  4. Comparable risk
  5. Negligible individual dose (NID)
- D. Sources of radiation
  1. Natural
  2. Man-made (artificial)
- E. Legal and ethical responsibilities

II. Units, Detection and Measurement
- A. Radiation units
  1. Exposure
     a. Coulomb/kilogram (C/kg) Roentgen (R)
  2. Absorbed dose
     a. Gray (Gy) (Rad)
  3. Kerma
     a. Kinetic energy release in matter
     b. Measurement unit in the gray
  4. Dose equivalent
     a. Sievert (Sv) (Rem)
  5. Measurement units in CT
     a. CTDI
     b. MSAD

c. DLP
6. Radioactivity
   a. Becquerel (Bq)
   b. Curie (Ci)

B. Dose reporting
   1. U.S. Nuclear Regulatory Commission (NRC) Regulations (10 Code of Federal Regulations [CFR]) Part 20 Standards for Radiation Protection
   2. National Council on Radiation Protection and Measurements (NCRP) Guidelines
      a. Dose quantities
         1) Effective dose (E)
         2) Collective effective dose (S)
         3) Average effective dose to an individual in a group exposed to a specific source (EExp)
         4) Effective dose per individual in the U.S. population whether exposed to the specific source or not (EUS)

C. Radiation detectors
   1. Area monitors
   2. Personal detectors

III. Surveys, Regulatory/Advisory Agencies and Regulations

A. General survey procedures
   1. Qualified expert
   2. Records

B. Equipment survey
   1. Conditions
   2. Radiographic and fluoroscopic equipment

C. Area survey
   1. Controlled/uncontrolled areas
   2. Conditions
   3. Recommendations
   4. "Radiation Area" sign posting
   5. Monitors

D. Regulatory/agencies
   1. Nuclear Regulatory Commission (NRC)
   2. Food and Drug Administration (FDA)
   3. EPA
   4. OSHA
   5. State agencies

E. Advisory agencies
   1. International Council on Radiation Protection and Measurements (ICRP)

2. National Council on Radiation Protection and Measurements (NCRP)
3. Biological Effects of Ionizing Radiation (BEIR)

F. Radiation safety officer
1. Requirements
2. Responsibilities

IV. Personnel Monitoring

A. Historical perspective
1. Evolution of standards
2. NRC Regulations (10 CFR) Part 20 Standards for Radiation Protection
3. NCRP recommendations
4. ICRP recommendations

B. Requirements for personnel monitoring
1. Deep dose equivalent (DDE)
2. Shallow dose equivalent (SDE)
3. Eye dose equivalent (EDE)
4. Total effective dose equivalent (TEDE)

C. Methods and types of personnel monitors
1. Film badge
2. Thermoluminescent dosimeter (TLD)
   a. Body badge
   b. Ring badge
3. Optically stimulated luminescent dosimeter (OSLD)

D. Records of accumulated dose
1. Purpose
2. Content
3. Length of recordkeeping
4. Retrieval from previous employers

E. Effective dose limits
1. Occupational
2. Nonoccupational limits
3. Critical organ sites
4. Embryo and fetus

F. Responsibilities for radiation protection
1. Radiographer
2. Radiation safety officer (RSO)
3. Facility

V. Application

A. Design

1. Materials
2. Primary barrier
3. Secondary (scatter and leakage) barrier
4. HVL and tenth-value layer (TVL)
5. Factors
    a. Use (U) controlled and uncontrolled
    b. Workload (W)
    c. Occupancy (T)
    d. Distance (D)
6. X-ray and ancillary equipment
    a. Beam-limiting devices
    b. Exposure control devices
    c. On and off switches
    d. Interlocks
    e. Visual/audio monitors
    f. Emergency controls
    g. Quality control
        1) Calibration
        2) Standards

B. Regulations and recommendations
    1. Current NRC recommendations and/or regulations
    2. Current NCRP recommendations and/or regulations
    3. Applicable state regulations
    4. Public Law 97-35 (The Patient Consumer Radiation Health and Safety Act of 1981)
    5. CARE
    6. Public awareness
        a. Background equivalent radiation time (BERT)
        b. Social marketing (Image Gently, Image Wisely)

C. Cardinal principles in protection
    1. Time
    2. Distance
    3. Shielding

D. Emergency procedures

VI. Patient Protection

A. Beam-limiting devices

B. Filtration

C. Shielding

D. Exposure factors

E. Positioning

F. Image receptor system

G. Immobilization

H. Fluoroscopic procedures

I. Mobile radiography

J. CT

K. Special considerations
   1. Pediatric patients
   2. Pregnant patients

Radiographic Pathology

Description
Content introduces concepts related to disease and etiological considerations with emphasis on radiographic appearance of disease and impact on exposure factor selection.

Content

I. Definitions/Terminology
- A. Pathology
- B. Disease
  1. Acute
  2. Chronic
- C. Pathogenesis
- D. Etiology
- E. Diagnosis
  1. Signs (objective)
  2. Symptoms (subjective)
- F. Prognosis
- G. Indications for procedure
- H. Manifestations of pathology
- I. Relevance to radiographic procedures
  1. Technical considerations
  2. Patient considerations

II. Classifications (Definition, Examples, Sites, Complications, Prognosis)
- A. Mechanics
- B. Chemicals
- C. Thermals
- D. Radiation

III. Causes of Disease (Process, Examples)
- A. Pathological
- B. Traumatic

C. Surgical

D. Healing process

E. Complications

F. Genetics (caused by or contributed to by genetic factors) vs. heredity

IV. Radiologic Pathology (Definitions, Etiology, Examples, Sites, Complications, Prognosis, Radiographic Appearance, Procedural and Technical Considerations, Appropriate Imaging Modality)

A. Skeletal

B. Digestive

C. Respiratory

D. Urinary

E. Reproductive

F. Circulatory

G. Endocrine

H. Nervous

Radiographic Procedures

Description
Content provides the knowledge base necessary to perform standard imaging procedures and special studies. Consideration is given to the evaluation of optimal diagnostic images.

Content

I. Standard Terminology for Positioning and Projection

A. Standard terms
   1. Radiographic position
   2. Radiographic projection
   3. Radiographic view

B. Positioning terminology
   1. Recumbent
   2. Supine
   3. Prone
   4. Trendelenburg
   5. Decubitus
   6. Erect/upright
   7. Anterior position
   8. Posterior position
   9. Oblique position

C. General planes
   1. Sagittal or midsagittal
   2. Coronal or midcoronal
   3. Transverse
   4. Longitudinal

D. Skull lines
   1. Glabellomeatal line
   2. Interpupillary line
   3. Orbitomeatal line
   4. Infraorbitomeatal line
   5. Acanthiomeatal line
   6. Mentomeatal line

E. Skull landmarks
   1. Auricular point
   2. Gonion (angle)
   3. Mental point
   4. Acanthion
   5. Nasion
   6. Glabella

7. Inner canthus
8. Outer canthus
9. Infraorbital margin
10. Occlusal plane
11. External auditory meatus
12. Mastoid tip

F. Terminology of movement and direction
   1. Cephalad/caudad
   2. Inferior/superior
   3. Proximal/distal
   4. Plantar/palmar
   5. Pronate/supinate
   6. Flexion/extension
   7. Abduction/adduction
   8. Inversion/eversion
   9. Medial/lateral

G. Positioning aids
   1. Sponges
   2. Sandbags
   3. Immobilization devices

H. Accessory equipment
   1. Calipers
   2. Lead strips
   3. Lead shields or shadow shields
   4. Lead markers
   5. Image receptor holders

II. General Considerations

A. Evaluation of radiographic orders
   1. Patient identification
   2. Verification of procedure(s) ordered
   3. Review of clinical history
   4. Clinical history and patient assessment
      a. Role of the radiographer
      b. Questioning skills
      c. Chief complaint
      d. Allergy history
      e. Localization
      f. Chronology
      g. Severity
      h. Onset
      i. Aggravating or alleviating factors
      j. Associated manifestations

k. Special considerations
5. Exam sequencing

B. Room preparation
1. Cleanliness, organization and appearance
2. Necessary supplies and accessory equipment available

III. Patient Considerations

A. Establishment of rapport with patient
1. Patient education
a. Communication
b. Common radiation safety issues and concerns
2. Cultural awareness
3. Determination of pregnancy

B. Patient preparation
1. Verification of appropriate dietary preparation
2. Verification of appropriate medication preparation
3. Appropriate disrobing and gowning
4. Removal of items that may cause artifacts

C. Patient assistance

D. Patient monitoring

E. Patient dismissal

IV. Positioning Considerations for Routine Radiographic Procedures

A. Patient instructions

B. Image analysis
1. Patient positioning
2. Part placement
3. Image receptor selection and placement
4. Beam-part-receptor alignment
5. Beam restriction and shielding

C. Special considerations
1. Atypical conditions
2. Mobile procedures
3. Surgical unit procedures
4. Special needs patients
5. Trauma
6. Obesity
7. Cultural awareness
8. Claustrophobia

D. Positioning for the following studies:
   1. Skeletal system
      a. Upper extremity
         1) Fingers
         2) Hand
         3) Wrist
         4) Forearm
         5) Elbow
         6) Humerus
      b. Shoulder
         1) Shoulder joint
         2) Scapula
         3) Clavicle
         4) Acromioclavicular articulations
      c. Lower extremity
         1) Toes
         2) Foot
         3) Ankle
         4) Calcaneus
         5) Tibia/fibula
         6) Knee
         7) Patella
         8) Femur
      d. Pelvic girdle
         1) Pelvis
         2) Hip
      e. Vertebral column
         1) Cervical
         2) Thoracic
         3) Lumbar
         4) Sacrum
         5) Coccyx
         6) Sacroiliac articulations
         7) Scoliosis survey
      f. Bony thorax
         1) Ribs
         2) Sternum
         3) Sternoclavicular articulations
      g. Cranium
         1) Skull
         2) Facial bones
         3) Nasal bones
         4) Orbits/optic foramina
         5) Zygomatic arches
         6) Mandible

7) Temporomandibular articulations
8) Paranasal sinuses

h. Special studies
1) Bone survey
2) Long bone measurement
3) Bone age
4) Foreign body

2. Respiratory system
a. Upper airway
b. Chest

3. Abdominal viscera
a. Abdomen and GI series
b. Urological studies

V. Procedural Considerations for Contrast Studies

A. Equipment and materials needed

B. Contrast media
1. Purpose
2. Types
a. Negative agents
1) Carbon dioxide
2) Air
3) Nitrous oxide
b. Positive agents
1) Barium sulfate
2) Iodinated

C. General procedure and follow-up care

D. Patient and body part positioning

E. Structures and functions demonstrated

F. Positioning for GI and genitourinary (GU) procedures
1. Digestive system
a. Single and double contrast examinations
1) Upper gastrointestinal system
2) Lower gastrointestinal system
b. Swallowing dysfunction study
c. Small bowel
2. Biliary system
a. Endoscopic retrograde cholangiographic pancreatography (ERCP)
b. Cholangiography
1) Operative cholangiography
2) T-tube cholangiography

3. Genitourinary system
    a. Intravenous urography
    b. Retrograde urography
    c. Cystography and cystourethrography
    d. Hysterosalpingography

G. Procedural considerations for the following special studies:
    1. Arthrography
    2. Myelography

VI. Additional Imaging Modalities and Radiation Therapy

A. CT, MR, nuclear medicine, ultrasonography, mammography, bone densitometry, interventional radiography
    1. Complement to diagnostic radiography
    2. Diagnostic advantages over routine radiography
    3. Sample exams(s) or procedure(s)
        a. Patient preparation
        b. Patient risk factors

B. Radiation therapy
    1. Complement to diagnostic radiography
    2. Principles of therapeutic and palliative radiation therapy
    3. Sample exam(s) or procedure(s)
        a. Patient preparation
        b. Patient risk factors

Required General Education

General education is an integral part of the development of a professional radiographer. The content is designed to assist in developing skills in communication, human diversity, scientific inquiry, critical thinking and judgment that are required to perform the responsibilities of an entry-level radiographer. Knowledge gained from general education serves to enhance the content and application of the radiography curriculum.

An additional goal of general education is to assist students in acquiring these types of skills. Postsecondary general education content is included as a "required" element of this radiography curriculum instead of as a "recommended" element. General education provides personal enrichment and exploration outside the confines of the technical professional curriculum. The general education content objectives in this curriculum were purposely labeled "global content objectives" to give program officials flexibility in determining specific college-level credit-bearing course work that will satisfy these objectives. There must be a minimum of 15 credit hours of general education course work. Written/oral communications and mathematics/analytical studies are required to satisfy a portion of the 15-credit-hour requirement. For the balance of general education credits, institutions are encouraged to draw upon varying areas of study to ensure a diversified educational experience (e.g., social/behavioral sciences, natural sciences, computing or humanities/fine arts).

Postsecondary general education is to be gained through college credit-bearing courses that meet the global content objectives listed below:

- Mathematical/logical reasoning (required).
  - Develop skills in analysis, quantification and synthesis.
  - Apply problem-solving or modeling strategies.

- Written/oral communications (required).
  - Write and read critically.
  - Speak and listen critically.
  - Develop the ability to perceive, gather, organize and present information.
  - Locate, evaluate and synthesize material from diverse sources and points of view.

- Arts and humanities.
  - Develop knowledge and understanding of the human condition.
  - Demonstrate respect for diverse populations.
  - Develop an understanding of ethics and the role they play in personal and professional lives.
  - Recognize and critically examine attitudes and values.

- Information systems.
  - Develop the knowledge base to use computerized systems.
  - Use technology to retrieve, evaluate and apply information.

- Social/behavioral sciences.
  - Assist in adapting interactions to meet cultural/psychological needs of people.
  - Develop an understanding of individual and collective behavior.
  - Promote the development of leadership skills.
  - Develop the capacity to exercise responsible and productive citizenship.
  - Function as a public-minded individual.

- Natural sciences.
  - Develop an understanding of the scientific method.
  - Make informed judgments about science-related topics.
  - Develop a scientific vocabulary.

Learning Objectives

This list of learning objectives, indexed by content area, serves as a resource for program planners and course managers.

Clinical Practice

Objectives

- Exercise the priorities required in daily clinical practice.
- Execute medical imaging procedures under the appropriate level of supervision.
- Adhere to team practice concepts that focus on organizational theories, roles of team members and conflict resolution.
- Adapt to changes and varying clinical situations.
- Describe the role of health care team members in responding/reacting to a local or national emergency.
- Provide patient-centered, clinically effective care for all patients regardless of age, gender, disability, special needs, ethnicity or culture.
- Integrate the use of appropriate and effective written, oral and nonverbal communication with patients, the public and members of the health care team in the clinical setting.
- Integrate appropriate personal and professional values into clinical practice.
- Recognize the influence of professional values on patient care.
- Explain how a person's cultural beliefs toward illness and health affect his or her health status.
- Use patient and family education strategies appropriate to the comprehension level of the patient/family.
- Provide desired psychosocial support to the patient and family.
- Demonstrate competent assessment skills through effective management of the patient's physical and mental status.
- Respond appropriately to medical emergencies.
- Examine demographic factors that influence patient compliance with medical care.
- Adapt procedures to meet age-specific, disease-specific and cultural needs of patients.
- Assess the patient and record clinical history.
- Demonstrate basic life support procedures.
- Use appropriate charting methods.
- Recognize life-threatening electrocardiogram (ECG) tracing.
- Apply standard and transmission-based precautions.
- Apply the appropriate medical asepsis and sterile technique.
- Demonstrate competency in the principles of radiation protection standards.
- Apply the principles of total quality management.
- Report equipment malfunctions.
- Examine procedure orders for accuracy and make corrective actions when applicable.
- Demonstrate safe, ethical and legal practices.
- Integrate the radiographer's practice standards into clinical practice setting.
- Maintain patient confidentiality standards and meet HIPAA requirements.
- Demonstrate the principles of transferring, positioning and immobilizing patients.
- Comply with departmental and institutional response to emergencies, disasters and accidents.

- Differentiate between emergency and non-emergency procedures.
- Adhere to national, institutional and departmental standards, policies and procedures regarding care of patients, providing radiologic procedures and reducing medical errors.
- Select technical factors to produce quality diagnostic images with the lowest radiation exposure possible.
- Critique images for appropriate anatomy, image quality and patient identification.
- Determine corrective measures to improve inadequate images.

Digital Image Acquisition and Display

Objectives

- Define terminology associated with digital imaging systems.
- Describe the various types of digital receptors.
- Describe the response of digital detectors to exposure variations.
- Compare the advantages and limits of each receptor type.
- Evaluate the spatial resolution and dose effectiveness for digital radiography detectors.
- Describe the histogram and the process or histogram analysis as it relates to automatic rescaling and determining an exposure indicator.
- Relate the receptor exposure indicator values to technical factors, system calibration, part/beam/plate alignment and patient exposure.
- Describe the response of PSP systems to background and scatter radiation.
- Use appropriate means of scatter control.
- Avoid grid use errors associated with grid cutoff and Moiré effect.
- Identify common limitations and technical problems encountered when using PSP systems.
- Employ appropriate beam/part/receptor alignment to avoid histogram analysis errors.
- Associate impact of image processing parameters to the image appearance.
- Apply the fundamental principles to digital detectors.
- Evaluate the effect of a given exposure change on histogram shape, data width and image appearance.
- Describe the conditions that cause quantum mottle in a digital image.
- Formulate a procedure or process to minimize histogram analysis and rescaling errors.
- Examine the potential impact of digital radiographic systems on patient exposure and methods of practicing the as low as reasonably achievable (ALARA) concept with digital systems.
- Describe picture archival and communications system (PACS) and its function.
- Identify components of a PACS.
- Define digital imaging and communications in medicine (DICOM).
- Describe HIPAA concerns with electronic information.
- Identify common problems associated with retrieving/viewing images within a PACS.

Ethics and Law in the Radiologic Sciences

Objectives

- Discuss the origins of medical ethics.
- Apply medical/professional ethics in the context of a broader societal ethic.
- Explain the role of ethical behavior in health care delivery.
- Explain concepts of personal honesty, integrity, accountability, competence and compassion as ethical imperatives in health care.
- Identify legal and professional standards and relate each to practice in health professions.
- Identify specific situations and conditions that give rise to ethical dilemmas in health care.
- Explain select concepts embodied in the principles of patients' rights, the doctrine of informed (patient) consent and other issues related to patients' rights.
- Explain the legal implications of professional liability, malpractice, professional negligence and other legal doctrines applicable to professional practice.
- Describe the importance of accurate, complete and correct methods of documentation as a legal/ethical imperative.
- Explore theoretical situations and questions relating to the ethics of care and health care delivery.
- Explain legal terms, principles, doctrines and laws specific to the radiologic sciences.
- Outline the conditions necessary for a valid malpractice claim.
- Describe institutional and professional liability protection typically available to the radiographer.
- Describe the components and implications of informed consent.
- Identify standards for disclosure relative to informed consent.
- Describe how consent forms are used relative to specific radiographic procedures.
- Differentiate between civil and criminal liability.
- Define tort and explain the differences between intentional and unintentional torts.

Human Structure and Function

Objectives

- Discuss the basics of anatomical nomenclature.
- Describe the chemical composition of the human body.
- Identify cell structure and elements of genetic control.
- Explain the essentials of human metabolism.
- Describe the types and functions of human tissues.
- Classify tissue types, describe the functional characteristics of each and give examples of their location within the human body.
- Describe the composition and characteristics of bone.
- Identify and locate the bones of the human skeleton.
- Identify bony processes and depressions found on the human skeleton.
- Describe articulations of the axial and appendicular skeleton.
- Differentiate the primary and secondary curves of the spine.
- Summarize the functions of the skeletal system.
- Label different types of articulations.
- Compare the types, locations and movements permitted by the different types of articulations.
- Examine how muscle is organized at the gross and microscopic levels.
- Differentiate between the structures of each type of muscle tissue.
- State the function of each type of muscle tissue.
- Name and locate the major muscles of the skeleton.
- Differentiate between the structure and function of different types of nerve cells.
- State the structure of the brain and the relationship of its component parts.
- Describe brain functions.
- List the meninges and describe the function of each.
- Outline how cerebrospinal fluid forms, circulates and functions.
- Describe the structure and function of the spinal cord.
- Determine the distribution and function of cranial and spinal nerves.
- Summarize the structure and function of components that comprise the autonomic nervous system.
- Describe the structures and functions of the components that comprise the human eye and ear.
- List the component body parts involved in the senses of smell and taste.
- List the somatic senses.
- Define endocrine.
- Describe the characteristics and functions of the components that comprise the endocrine system.
- Describe the hard and soft palates.
- Describe the structure and function of the tongue.

- Identify the structure, function and locations of the salivary glands.
- Describe the composition and characteristics of the primary organs of the digestive system.
- Describe the function(s) of each primary organ of the digestive system.
- Differentiate between the layers of tissue that comprise the esophagus, stomach, small intestine, large intestine and rectum.
- Differentiate between peritoneum, omentum and mesentery.
- List and label the accessory organs of the digestive system and describe their function.
- Identify the secretions and function of each accessory organ of the digestive system.
- Explain the purpose of digestion.
- List the digestive processes that occur in the body.
- Describe the composition and characteristics of blood.
- List the types of blood cells and state their functions.
- Differentiate between blood plasma and serum.
- Outline the clotting mechanism.
- List the blood types.
- Explain the term Rh factor.
- Explain the antigen/antibody relationship and its use in blood typing.
- Label the parts of the human heart.
- Describe the flow of blood through the body and identify the main vessels.
- Describe the structure and function of arteries, veins and capillaries.
- Differentiate between arterial blood in systemic circulation and arterial blood in pulmonary circulation.
- Outline the major pathways of lymphatic circulation.
- Correlate cardiac electrophysiology to a normal ECG tracing.
- Differentiate between nonspecific defenses and specific immunity.
- Explain antibody production and function.
- List the different types and functions of T- and B-cells and explain their functions.
- Label the components of the respiratory system.
- Describe the physiology and regulation of respiration.
- Label the parts of the kidneys, ureters, bladder and urethra.
- Describe the function of each organ of the urinary system.
- Describe the composition and formation of urine.
- Explain micturition.
- Label the anatomy of the male and female reproductive organs.
- Analyze the function of each of the male and female reproductive organs.
- Identify major sectional anatomical structures found within the head/neck, thorax and abdomen.

Image Analysis

Objectives

- Discuss the elements of a radiographic image.
- Identify anatomy on radiographic images.
- Apply a problem-solving process used for image analysis.
- Describe an effective image analysis method.
- Describe the role of the radiographer in image analysis.
- Apply the process for evaluating images for adequate density/brightness, contrast, recorded detail/spatial resolution and acceptable limits of distortion.
- Explain how the radiographer determines that an adequate level of penetration has been applied to produce an acceptable image.
- Summarize the importance of proper positioning.
- Discuss the impact of patient preparation on the resulting radiographic image.
- Analyze images to determine the appropriate use of beam restriction.
- Identify common equipment malfunctions that affect image quality, and corrective action.
- Differentiate between technical factor problems, procedural factor problems and equipment malfunctions.
- Critique images for appropriate technical, procedural and pathologic factors, and employ corrective actions if necessary.
- Differentiate images produced by various modalities.

Imaging Equipment

Objectives

- Define potential difference, current and resistance.
- Identify the general components and functions of the tube and filament circuits.
- Compare generators in terms of radiation produced and efficiency.
- Discuss permanent installation of radiographic equipment in terms of purpose, components, types and applications.
- Demonstrate operation of various types of permanently installed and mobile radiographic equipment.
- Discuss mobile units in terms of purpose, components, types and applications.
- Describe functions of components of automatic exposure control (AEC) devices.
- Demonstrate proper use of AEC devices.
- Identify the components of diagnostic x-ray tubes.
- Explain protocols used to extend x-ray tube life.
- Explain image-intensified and digital fluoroscopy.
- Indicate the purpose, construction and application of video camera tubes, CCD and TV monitors.
- Differentiate between quality improvement/management, quality assurance and quality control.
- List the benefits of a quality control to the patient and to the department.
- Discuss the proper test equipment/procedures for evaluating the operation of an x-ray generator.
- Evaluate the results of basic QC tests.
- Discuss the basic principles of operation of various imaging modalities and radation therapy.

Introduction to Computed Tomography

Objectives

- Describe the components of the CT imaging system.
- Explain the functions of collimators in CT.
- List the CT computer data processing steps.
- Define algorithm and explain its impact on image scan factors and reconstruction.
- Define raw data and image data.
- Describe the following terms in relation to the CT data acquisition process:
  - Pixel.
  - Matrix.
  - Voxel.
  - Linear attenuation coefficient.
  - CT/Hounsfield number.
  - Partial volume averaging.
  - Window width (ww) and window level (wl).
  - Spatial resolution.
  - Contrast resolution.
  - Noise.
  - Annotation.
  - Region of interest (ROI).
- Name the common controls found on CT operator consoles and describe how and why each is used.
- Identify the types and appearance of artifacts most commonly affecting CT images.
- Name the radiation protection devices that can be used to reduce patient dose in CT and describe the correct application of each.
- Describe the general purpose of commonly performed CT studies.
- Discuss general radiation safety and protection practices associated with examinations in CT.

Introduction to Radiologic Science and Health Care

Objectives

- Identify other health science professions that participate in the patient's total health care.
- Identify various settings involved in the delivery of health care.
- Discuss the reimbursement/payment options for health care services.
- Discuss the role and value of a mission statement to the operation of an institution.
- Describe relationships and interdependencies of departments within a health care institution.
- Discuss the responsibilities and relationships of all personnel in the radiology department.
- Differentiate between quality improvement/management, quality assurance and quality control.
- Differentiate among accreditation types.
- Define credentialing, certification, registration, licensure and regulations.
- Discuss career opportunities and advancement for the radiographer.
- Identify the benefits of continuing education as related to improved patient care and professional enhancement.

Medical Terminology

Objectives

- Apply the word-building process.
- Interpret medical abbreviations and symbols.
- Critique orders, requests and diagnostic reports.
- Define medical imaging and radiation oncology terms.
- Translate medical terms, abbreviations and symbols into common language from a medical report.

Patient Care in Radiologic Sciences

Objectives

- Identify the responsibilities of the health care facility and members of the health care team.
- List the general responsibilities of the radiographer.
- Describe the practice standards for the radiographer as defined by the ASRT and state licensure.
- Differentiate between culture and ethnicity.
- Explain how a person's cultural beliefs toward illness and health affect his or her health status.
- Explain perceptions of dying and death from the viewpoint of both patient and radiographer.
- Describe the characteristics of each stage of grief.
- Identify methods for determining the correct patient for a given procedure.
- Explain the use of various communication devices and systems.
- Explain specific aspects of a radiographic procedure to the patient.
- Demonstrate correct principles of body mechanics applicable to patient care.
- Demonstrate techniques for specific types of patient transfer.
- Demonstrate select procedures to turn patients with various health conditions.
- Describe select immobilization techniques for various types of procedures and patient conditions.
- Describe specific patient safety measures and concerns.
- Explain the purpose, legal considerations and procedures for incident reporting.
- Describe methods to evaluate patient physical status.
- List the information to be collected prior to a patient examination.
- Describe vital signs and lab values used to assess patient condition, including sites for assessment and normal values.
- Define terms related to infection control.
- Describe the importance of standard precautions and isolation procedures, including sources and modes of transmission of infection and disease and institutional control procedures.
- Identify symptoms related to specific emergency situations.
- Describe the institution's emergency medical code system and the role of the student during a medical emergency.
- Explain the age-specific considerations necessary when performing radiographic procedures.
- Describe appropriate procedures for management of various types of trauma situations.
- Describe the symptoms and medical interventions for a patient with a contrast agent reaction.
- Explain the role of the radiographer in patient education.
- Describe the patient preparation for contrast studies.
- Identify specific types of tubes, lines, catheters and collection devices.
- Outline the steps in the operation and maintenance of suction equipment.
- Outline the steps in the operation and maintenance of oxygen equipment and demonstrate proper use.

- Demonstrate competency in basic life support (BLS).
- Describe the steps in performing various mobile procedures.
- Describe the special problems faced in performing procedures on a patient with a tracheotomy and specific tubes, drains and catheters.
- Describe the procedure for producing diagnostic images in the surgical suite.
- Explain the appropriate radiation protection required when performing mobile/surgical radiography.

Pharmacology and Venipuncture

Objectives

- Distinguish among the chemical, generic and trade names for drugs in general.
- Describe pharmacokinetic and pharmacodynamic principles of drugs.
- Explain the uses and impact of drug categories on the patient.
- Define the categories of contrast agents and give specific examples for each category.
- Explain the pharmacology of contrast agents.
- Describe methods and techniques for administering various types of contrast agents.
- Identify and describe the routes of drug administration.
- Demonstrate appropriate venipuncture technique.
- Differentiate between the two major sites of intravenous drug administration.
- Identify, describe and document complications associated with venipuncture and appropriate actions to resolve these complications.
- Discuss the various elements of initiating and discontinuing intravenous access.
- Differentiate and document dose calculations for adult and pediatric patients.
- Prepare for injection of contrast agents/intravenous medications using aseptic technique.
- Explain the current legal status and professional liability issues of the radiographer's role in contrast and/or drug administration.

Principles of Imaging

Objectives

- Discuss practical considerations in setting standards for acceptable image quality.
- Assess radiographic exposure on radiographic images.
- Analyze the relationships of factors that control and affect image exposure.
- Critique the radiographic contrast within various radiographic images.
- Analyze the relationship of factors that control and affect radiographic contrast.
- Critique recorded detail on various radiographic images.
- Analyze the relationships of factors that control and affect recorded detail.
- Differentiate between size and shape distortion.
- Perform calculations to determine image magnification and percent magnification.
- Summarize the relationship of factors that control and affect distortion.
- Summarize the relationship of factors affecting exposure latitude.
- Explain the rationale for using beam-limiting devices.
- Describe the operation and applications for different types of beam-limiting devices.
- Explain how beam filtration affects x-ray beam intensity, beam quality and resultant patient exposure.
- Describe the change in the half-value layer (HVL) when filtration is added or removed in the beam.
- Summarize the relationship of factors affecting scattered and secondary radiation.
- Evaluate the effects of scattered radiation on the image.
- Compare grid types.
- Select the most appropriate grid for a given clinical situation.
- Interpret grid efficiency in terms of grid ratio and frequency.
- Summarize the factors that influence grid cutoff.
- Evaluate grid artifacts.
- Explain the use of standardized radiographic technique charts.
- Explain exposure factor considerations involved in selecting techniques.
- Compare fixed kilovoltage peak (kVp) and variable kVp systems.
- Apply the reciprocity law to clinical situations.
- Apply conversion factors for changes in the following areas: distance, grid, image receptors, reciprocity law and 15 percent rule.

Radiation Biology

Objectives

- Differentiate between ionic and covalent molecular bonds.
- Describe principles of cellular biology.
- Identify sources of electromagnetic and particulate ionizing radiations.
- Discriminate between direct and indirect ionizing radiation.
- Discriminate between the direct and indirect effects of radiation.
- Identify sources of radiation exposure.
- Describe radiation-induced chemical reactions and potential biologic damage.
- Evaluate factors influencing radiobiologic/biophysical events at the cellular and subcellular level.
- Identify methods to measure radiation response.
- Describe physical, chemical and biologic factors influencing radiation response of cells and tissues.
- Explain factors influencing radiosensitivity.
- Recognize the clinical significance of lethal dose (LD).
- Identify specific cells from most radiosensitive to least radiosensitive.
- Employ dose response curves to study the relationship between radiation dose levels and the degree of biologic response.
- Examine effects of limited vs. total body exposure.
- Relate short-term and long-term effects as a consequence of high and low radiation doses.
- Differentiate between somatic and genetic radiation effects and discuss specific diseases or syndromes associated with them.
- Discuss stochastic (probabilistic) and nonstochastic (deterministic) effects.
- Discuss embryo and fetal effects of radiation exposure.
- Discuss risk estimates for radiation-induced malignancies.
- Discuss acute radiation syndromes.

Radiation Production and Characteristics

Objectives

- Describe fundamental atomic structure.
- Explain the processes of ionization and excitation.
- Describe the electromagnetic spectrum.
- Describe wavelength and frequency and how they are related to velocity.
- Explain the relationship of energy, wavelength and frequency.
- Explain the wave-particle duality phenomena.
- Identify the properties of x-rays.
- Describe the processes of ionization and excitation.
- Describe charged and uncharged forms of particulate radiation.
- Differentiate between ionizing and nonionizing radiation.
- Describe radioactivity and radioactive decay in terms of alpha, beta and gamma emission.
- Compare the production of bremsstrahlung and characteristic radiations.
- Describe the conditions necessary to produce x-radiation.
- Describe the x-ray emission spectra.
- Identify the factors that affect the x-ray emission spectra.
- Discuss various photon interactions with matter by describing the interaction, relation to atomic number, photon energy and part density, and their applications in diagnostic radiology.
- Discuss relationships of wavelength and frequency to beam characteristics.
- Discuss the clinical significance of the photoelectric and modified scattering interactions in diagnostic imaging.

Radiation Protection

Objectives

- Identify and justify the need to minimize unnecessary radiation exposure of humans.
- Distinguish between somatic and genetic radiation effects.
- Differentiate between the stochastic (probabilistic) and nonstochastic (deterministic) effects of radiation exposure.
- Explain the objectives of a radiation protection program.
- Define radiation and radioactivity units of measurement.
- Identify effective dose limits (EDL) for occupational and nonoccupational radiation exposure.
- Describe the ALARA concept.
- Identify the basis for occupational exposure limits.
- Distinguish between perceived risk and comparable risk.
- Describe the concept of the negligible individual dose (NID).
- Identify ionizing radiation sources from natural and man-made sources.
- Comply with legal and ethical radiation protection responsibilities of radiation workers.
- Describe the relationship between irradiated area and effective dose.
- Describe the theory and operation of radiation detection devices.
- Identify appropriate applications and limitations for each radiation detection device.
- Describe how isoexposure curves are used for radiation protection.
- Identify performance standards for beam-limiting devices.
- Describe procedures used to verify performance standards for equipment and indicate the potential consequences if the performance standards fail.
- Describe the operation of various interlocking systems for equipment and indicate potential consequences of interlock system failure.
- Identify conditions and locations evaluated in an area survey for radiation protection.
- Distinguish between controlled and non-controlled areas and list acceptable exposure levels.
- Describe "Radiation Area" signs and identify appropriate placement sites.
- Describe the function of federal, state and local regulations governing radiation protection practices.
- Describe the requirements for and responsibilities of a radiation safety officer.
- Express the need and importance of personnel monitoring for radiation workers.
- Describe personnel monitoring devices, including applications, advantages and limitations for each device.
- Interpret personnel monitoring reports.
- Compare values for individual effective dose limits for occupational radiation exposures (annual and lifetime).
- Identify anatomical structures that are considered critical for potential late effects of whole body irradiation exposure.
- Identify effective dose limits for the embryo and fetus in occupationally exposed women.

- Distinguish between primary and secondary radiation barriers.
- Demonstrate how the operation of various x-ray and ancillary equipment influences radiation safety and describe the potential consequences of equipment failure.
- Perform calculations of exposure with varying time, distance and shielding.
- Discuss the relationship between workload, energy, half-value layer (HVL), tenth-value layer (TVL), use factor and shielding design.
- Identify emergency procedures to be followed during failures of x-ray equipment.
- Demonstrate how time, distance and shielding can be manipulated to keep radiation exposures to a minimum.
- Explain the relationship of beam-limiting devices to patient radiation protection.
- Discuss added and inherent filtration in terms of the effect on patient dosage.
- Explain the purpose and importance of patient shielding.
- Identify various types of patient shielding and state the advantages and disadvantages of each type.
- Use the appropriate method of shielding for a given radiographic procedure.
- Explain the relationship of exposure factors to patient dosage.
- Explain how patient position affects dose to radiosensitive organs.
- Identify the appropriate image receptor that will result in an optimum diagnostic image with the minimum radiation exposure to the patient.
- Select the immobilization techniques used to eliminate voluntary motion.
- Describe the minimum source-to-tabletop distances for fixed and mobile fluoroscopic devices.
- Apply safety factors for the patient, health care personnel and family members in the room during radiographic procedures.

Radiographic Pathology

Objectives

- Define basic terms related to pathology.
- Describe the basic manifestations of pathological conditions and their relevance to radiologic procedures.
- Discuss the classifications of trauma.
- Describe imaging procedures used in diagnosing disease.
- List the causes of tissue disruption.
- Describe the healing process.
- Identify complications connected with the repair and replacement of tissue.
- Describe the various systemic classifications of disease in terms of etiology, types, common sites, complications and prognosis.
- Describe the radiographic appearance of diseases.
- Identify imaging procedures and interventional techniques appropriate for diseases common to each body system.
- Identify diseases caused by or connected to genetic factors.

Radiographic Procedures

Objectives

- Describe standard positioning terms.
- Demonstrate proper use of positioning aids.
- Discuss general procedural considerations for radiographic exams.
- Identify methods and barriers of communication and describe how each may be used or overcome effectively during patient education.
- Explain radiographic procedures to patients/family members.
- Modify directions to patients with various communication problems.
- Develop an awareness of cultural factors that necessitate adapting standard exam protocols.
- Adapt general procedural considerations to specific clinical settings.
- Identify the structures demonstrated on routine radiographic and fluoroscopic images.
- Adapt radiographic and fluoroscopic procedures for special considerations.
- Simulate radiographic and fluoroscopic procedures on a person or phantom in a laboratory setting.
- Evaluate images for positioning, centering, appropriate anatomy and overall image quality.
- Discuss equipment and supplies necessary to complete basic radiographic and fluoroscopic procedures.
- Explain the patient preparation necessary for various contrast and special studies.
- Explain the routine and special positions/projections for all radiographic/fluoroscopic procedures.
- Explain the purpose for using contrast media.
- Name the type, dosage and route of administration of contrast media commonly used to perform radiographic contrast and special studies.
- Describe the general purpose of radiographic and fluoroscopic studies.
- Apply general radiation safety and protection practices associated with radiographic and fluoroscopic examinations.

Optional Content

This section is intended to decrease the hardship imposed on programs by requiring instructional content that is representative of technologies and technical principles that have been replaced with newer technical systems. It is recognized that traditional technologies are still part of the fabric of many communities. Content in this section will assist program planners wishing to enhance the curriculum with select topics of instruction intended to satisfy the mission of a given program and/or local employment market.

The Basic Principles of Computed Tomography content in this section will aid program planners in developing computed tomography instruction beyond a brief introduction to this technology.

Basic Principles of Computed Tomography

Description
Content provides entry-level radiography students with principles related to computed tomography (CT) imaging.

Objectives
- Explain the difference between reconstructing and reformatting an image.
- Cite the structures demonstrated on commonly performed CT images.
- Simulate commonly performed CT procedures on a person or phantom.
- Evaluate images for positioning, centering, appropriate anatomy and overall image quality.
- Discuss equipment and supplies necessary to complete commonly performed CT procedures.
- Explain the CT acquisition protocol for commonly performed head/neck, thorax and abdomen procedures.
- Explain the patient preparation necessary for commonly performed CT contrast studies.
- Name the type, dosage purpose, and route of contrast administration for common CT procedures.

Content

I. Computed Tomography Generations: Capabilities and Limitations

A. First

B. Second

C. Third

D. Fourth

E. Fifth

F. Spiral

G. Postprocessing
   1. Image reformation
   2. Image smoothing
   3. Edge enhancement
   4. Window level and width

II. Clinical Competencies

A. Head

B. Thorax

C. Abdomen

Note: Although this may not be seen in the ARRT mandatory or elective radiography clinical competencies, a basic understanding of computed tomography is increasingly expected of new program graduates. In planning student clinical experiences, radiography programs with sufficient local resources are encouraged to provide students with clinical exposure to computed tomography.

Film-Screen Image Acquisition and Processing

Description
Content establishes a knowledge base in factors that govern the image production process. Film imaging with related accessories is emphasized.

Objectives
- Describe the effects of storage on image quality.
- Discuss safelight illumination appropriate for specific image receptor systems.
- Discuss darkroom-related Occupational Safety & Health Administration (OSHA) standards for health and safety.
- Discuss the possible causes and health implications of "darkroom chemical sensitivity."
- Describe the function of each component of radiographic film.
- Explain latent image formation.
- Describe the features of the characteristic curve and explain its purpose.
- Select the most appropriate image receptor to be used for given clinical situations.
- Describe various types of image receptor holders.
- Describe the function of each component of an intensifying screen.
- Select the most appropriate intensifying screen for given clinical situations.
- Identify procedures that ensure a long screen life devoid of artifacts and distortion.
- Analyze the effects of processing on image quality.
- Identify key components of an automatic film processor.
- Demonstrate how various film sizes are fed into the film processor.
- Analyze the steps of the processing cycle by providing the specific action and duration of time for each step.
- Identify the purpose of a daily quality control program for processors.
- Identify types of image artifacts and analyze them to determine the cause.
- Identify common silver recovery methods.

Content

I. Darkroom/Storage Environment

A. Location/construction/function

B. Darkroom environment
   1. Temperature
   2. Humidity
   3. Ventilation
   4. Lighting
      a. Safelight
         1) Filter colors – spectral emission vs. film sensitivity
         2) Mounting distance and direction
         3) Bulb size/wattage
         4) Safelight testing

b. Overhead light
5. Radiation shielding
6. Film handling considerations

C. Film storage considerations
1. Temperature
2. Humidity
3. Light
4. Radiation
5. Pressure
6. Inventory control

D. Safety
1. Occupational Safety & Health Administration (OSHA)
2. Material safety data sheet (MSDS)
3. Darkroom chemical sensitivity

II. Characteristics of Film

A. Properties
1. Contrast
2. Exposure response – speed sensitivity
3. Recorded detail – spatial resolution

B. Latent image formation

C. Response curves – D-LogE, Hurter and Driffield (H&D) or characteristic
1. Speed
2. Control contrast – average gradient
3. Exposure latitude

III. Image Receptor Holders and Intensifying Screens

A. Cassettes
1. Purpose
2. Construction
3. Loading/unloading
4. Maintenance

B. Intensifying screens
1. Purpose
2. Construction/composition
3. Principles of function
4. Classification
a. Phosphor spectral emission
b. Absorption efficiency
c. Speed
5. Maintenance
a. Handling

b. Cleaning
c. Evaluating

IV. Automatic Processing

A. Purpose

B. Components
1. Developer
2. Fixer
3. Wash
4. Dryer

C. Systems
1. Transport
2. Replenishment
3. Recirculation
4. Temperature control
5. Dryer

D. Film feed

E. Maintenance/cleaning

F. Quality control and documentation

V. Artifacts

A. Types

B. Causes

C. Effects

D. Preventive/corrective maintenance

VI. Silver Recovery

A. Rationale

B. Methods
1. Electrolytic
2. Metallic replacement/ion exchange
3. Discarded film

C. Security

Imaging Equipment

Description
Content establishes a knowledge base in radiographic, fluoroscopic and mobile equipment requirements and design. The content also provides a basic knowledge of quality control.

Objectives
- Apply the basic principles of linear tomography in the patient care setting.

Content
I. Linear Tomography
A. Purpose

B. Principles

C. Equipment

D. Applications

Introduction to Forensic Radiography

Description
Content introduces entry-level radiography students to the scientific discipline of forensic radiography.

Objectives
- Identify common areas of forensic study enhanced with radiologic imaging.
- Identify common procedures performed by forensic radiographers.
- Discuss the importance of producing pre- and postmortem images of comparable quality.
- Discuss the importance of radiographic images as forms of evidence in a court of law.

Content

I. Scope of Forensic Radiology Radiography
- A. Service
- B. Education
- C. Concerns of public health and safety
- D. Mass casualty
- E. Child abuse
- F. Research
- G. Domestic abuse
- H. Abuse of the elderly
- I. Human rights abuse, torture, terrorism

II. Imaging for Investigative Procedures
- A. Basal skull
- B. Burned remains
- C. Decomposed body
- D. Gunshot wounds
- E. Intraoral investigation
- F. Missile identification

G. Motor vehicle accidents

H. Removal of artifacts

I. Skeletal remains

J. Unidentified corpse

III. Legal Responsibilities

A. Parameters of legal responsibility

B. Scope of practice and responsibilities of the forensic assistant

C. Legal proceedings

D. Admissibility of scientific evidence

E. Federal rules of evidence

F. The expert witness

G. Discovery and deposition

H. Testimony in court

I. Admissibility of radiological images and results

Sectional Anatomy

Description
Content begins with a review of gross anatomy of the entire body. Detailed study of gross anatomical structures will be conducted systematically for location, relationship to other structures and function.

Gross anatomical structures are located and identified in axial (transverse), sagittal, coronal and orthogonal (oblique) planes. Illustrations and anatomy images will be compared with MR and CT images in the same imaging planes and at the same level when applicable. The characteristic appearance of each anatomical structure as it appears on a CT, MR and ultrasound image, when applicable, will be stressed.

Objectives
- Name the anatomical structures located within the head and neck.
- Describe the relationship of each anatomical structure in the head and neck to surrounding structures.
- Describe the function of each anatomical structure in the head and neck.
- Locate each anatomical structure on CT, MR and ultrasound images in the transverse axial, coronal, sagittal and orthogonal (oblique) cross-sectional imaging planes.
- Name the anatomical structures located within the thorax.
- Describe the relationship of each thoracic structure to surrounding structures.
- Describe the function of each anatomical structure located within the thorax.
- Locate each anatomical structure of the thorax on CT, MR and ultrasound images in the transverse axial, coronal, sagittal and oblique imaging planes.
- List and describe the function of each anatomical structure located within the abdomen and pelvis.
- Describe the relationship of each anatomical structure in the abdomen and pelvis to surrounding structures.
- Locate each anatomical structure of the abdomen and pelvis on CT, MR, PET and ultrasound images in the axial, coronal, sagittal and oblique planes.
- Name and describe the function of each anatomical structure located in the upper and lower extremities.
- Locate each anatomical structure in the upper and lower extremities on CT and MR images in the transverse axial, coronal, sagittal and oblique planes.

Content

I. Head and Brain

A. Surface anatomy of the brain

1. Fissures (sulci)
   a. Longitudinal cerebral
   b. Lateral (Sylvian)
   c. Central (of Rolando)
2. Convolutions (gyri)

a. Precentral
b. Postcentral

B. Sinuses
1. Frontal
2. Maxillary
3. Ethmoidal
4. Sphenoidal

C. Facial bones
1. Mandible
2. Maxillae
3. Zygomas
4. Nasal bones

D. Facial muscles

E. Cranial bones
1. Frontal
2. Ethmoid
   a. Nasal conchae (turbinates)
   b. Nasal septum
3. Parietal
4. Sphenoid
   a. Lesser wings
      1) Tuberculum sellae
      2) Sella turcica
      3) Dorsum sellae
      4) Anterior and posterior clinoid process
      5) Optic canals
   b. Greater wings
      1) Foramen rotundum
      2) Foramen ovale
         a) Foramen spinosum
5. Occipital
   a. Foramen magnum
   b. Internal and external occipital protuberance
   c. Jugular foramen
6. Temporal
   a. Zygomatic process
   b. External auditory meatus (EAM)
   c. Internal auditory canal
   d. Mastoid process
   e. Petrous portion or ridge

F. Lobes of the brain and midline cerebral hemisphere structures

1. Frontal
2. Parietal
3. Occipital
4. Temporal
5. Insula (Island of Reil)
6. Cerebellum
7. Corpus callosum (genu, rostrum, body and splenium)
8. Septum pellucidum
9. Sella turcica
10. Pineal gland
11. Falx cerebri
12. Septum pellucidum

G. Cranial nerves
   1. Olfactory
   2. Optic
   3. Oculomotor
   4. Trochlear
   5. Trigeminal
   6. Abducens
   7. Facial
   8. Vestibulocochlear
   9. Glossopharyngeal
   10. Vagus
   11. Accessory
   12. Hypoglossal

H. Brainstem and adjoining structures
   1. Diencephalon
      a. Thalamus
      b. Hypothalamus
      c. Optic chiasm
      d. Optic tracts
      e. Infundibulum (pituitary stalk)
      f. Pituitary gland
      g. Mammillary bodies
      h. Pineal gland
   2. Midbrain
   3. Pons
   4. Medulla oblongata
      a. Spinal cord

I. Arteries (Circle of Willis)
   1. Vertebral
   2. Basilar
   3. Internal carotid

4. Anterior and posterior communicating
5. Anterior and posterior cerebral
6. Middle cerebral

J. Veins
   1. Venous sinuses
      a. Superior sagittal sinus
      b. Vein of Galen
      c. Straight sinus
      d. Confluence of sinuses (torcular herophili)
      e. Transverse sinus
      f. Sigmoid sinus
   2. Internal jugular

K. Ventricular system
   1. Lateral ventricles (anterior, body, posterior, inferior or temporal and trigone or antrium)
   2. Interventricular foramen (of Monro)
   3. Third ventricle
   4. Cerebral aqueduct (of Sylvius)
   5. Fourth ventricle
   6. Foramen of Luschka
   7. Foramen of Magendie
   8. Choroid plexus

L. Meninges
   1. Dura mater
      a. Extensions of the dura mater
         1) Falx cerebri
         2) Falx cerebelli
         3) Tentorium cerebelli
         4) Diaphragma sellae
   2. Arachnoid
   3. Pia mater

M. Basal ganglia
   1. Caudate nucleus
   2. Putamen
   3. Globus pallidus
   4. Claustrum
   5. Internal capsule
   6. External capsule
   7. Extreme capsule

N. Orbit
   1. Globe

2. Lens
3. Optic nerve
4. Lacrimal gland
5. Lateral rectus muscle
6. Medial rectus muscle
7. Superior rectus muscle
8. Inferior rectus muscle
9. Superior oblique muscle
10. Inferior oblique muscle
11. Orbital fat
12. Ophthalmic artery
13. Retinal vein

O. Anatomical structures of brain
1. Diploe
2. Subcutaneous soft tissue
3. Superior sagittal sinus (anterior and posterior)
4. Central sulcus
5. Interhemispheric fissure
6. Falx cerebri
7. Centrum semiovale
8. Corpus callosum (genu, rostrum, body and splenium)
9. Septum pellucidum
10. Fornix
11. Sylvian fissure
12. Insula
13. Lentiform nucleus (putamen and globus pallidus)
14. Caudate nucleus (head)
15. Internal capsule (anterior, body and posterior sections)
16. External capsule
17. Claustrum
18. Hippocampus
19. Cerebral peduncles
20. Mammillary bodies
21. Tentorium cerebelli
22. Petrous portion or ridge
23. Cerebellar tonsil
24. Internal auditory canal (IAC)
25. Nasal septum
26. External auditory canal (EAC)
27. Clivus
28. Mastoid air cells

P. Lines of angulation (imaging baselines)
1. Supraorbitomeatal line
2. Orbitomeatal line

3. Infraorbitomeatal line

Q. Anatomical landmarks
   1. Glabella
   2. Nasion
   3. Acanthion
   4. Mental point
   5. External auditory meatus (EAM)

II. Neck

A. Bones
   1. Cervical vertebrae

B. Organs
   1. Pharynx
   2. Larynx
   3. Esophagus
   4. Trachea
   5. Salivary glands
   6. Thyroid gland
   7. Parathyroid glands
   8. Lymph nodes

C. Vasculature and neurovasculature
   1. Carotid arteries
   2. Vertebral arteries
   3. Jugular veins
   4. Carotid sheath

D. Musculature
   1. Anterior triangle
   2. Posterior triangle

III. Chest and Mediastinum

A. Bony thorax
   1. Thoracic vertebrae
   2. Sternum
   3. Ribs
   4. Costal cartilages
   5. Scapulae
   6. Clavicles

B. Pulmonary
   1. Apices (lung)
   2. Diaphragm
   3. Angles

4. Hilum
5. Lobes (lungs)
6. Trachea
7. Carina
8. Primary (mainstem) bronchi
9. Secondary bronchi

C. Mediastinum
1. Thymus gland
2. Heart
   a. Arteries
   b. Veins
   c. Chamber
   d. Valves
3. Pulmonary vessels
4. Coronary vessels
5. Ascending aorta
6. Aortic arch
7. Branches of the aortic arch
8. Descending (thoracic) aorta
9. Inferior vena cava
10. Esophagus
11. Trachea
12. Thoracic duct
13. Lymph nodes
14. Azygos vein
15. Hemiazygos vein

D. Breasts

E. Musculature

IV. Abdomen

A. Diaphragm and openings
1. Aortic hiatus
2. Caval hiatus
3. Esophageal hiatus

B. Surface landmarks and regions
1. Quadrants
   a. Upper left
   b. Upper right
   c. Lower left
   d. Lower right

C. Addison's planes (regions)

1. Left hypochrondric
2. Epigastric
3. Right hypochondric
4. Left lumbar
5. Umbilical
6. Right lumbar
7. Left iliac
8. Hypogastric
9. Right iliac

D. Branches of the abdominal aorta
   1. Anterior visceral branches
      a. Celiac axis
         1) Left gastric
         2) Splenic
         3) Hepatic
   2. Superior mesenteric
      a. Jejunal and ileal
      b. Inferior pancreaticoduodenal
      c. Middle colic
      d. Right colic
      e. Ileocolic
   3. Inferior mesenteric
      a. Left colic
      b. Sigmoid
      c. Superior rectal
   4. Lateral visceral branches
      a. Suprarenal
      b. Renal
      c. Testicular or ovarian
   5. Parietal branches
      a. Inferior phrenics
      b. Lumbars
      c. Middle sacral
   6. Terminal branches
      a. Common iliacs

E. Tributaries of the vena cava
   1. Anterior visceral
      a. Hepatic veins
   2. Lateral visceral
      a. Right suprarenal
      b. Renal veins
      c. Right testicular or ovarian
   3. Tributaries of origin
      a. Common iliacs

b. Median sacral

F. Tributaries of the portal vein
1. Splenic
2. Inferior mesenteric
3. Superior mesenteric
   a. Left gastric
   b. Right gastric
   c. Cystic

G. Abdominal organs and structures
1. Bony structures
   a. Lumbar vertebrae
2. Abdominal cavity
   a. Peritoneum
   b. Peritoneal space
   c. Retroperitoneum
   d. Retroperitoneal space
3. Liver
   a. Hepatic arteries
   b. Portal veinous system
4. Gallbladder and biliary system
5. Pancreas and pancreatic ducts
6. Spleen
7. Adrenal glands
8. Urinary system and tract
   a. Kidneys
   b. Ureters
9. Stomach
10. Small intestine
11. Colon
12. Musculature

V. Pelvis

A. Bony structures
1. Proximal femur
2. Ilium
3. Ischium
4. Pubis
5. Sacrum
6. Coccyx

B. Pelvic vasculature
1. Arterial
   a. Common iliacs
   b. Internal iliacs

c. External iliacs
d. Ovarian/testicular

2. Venous
a. External iliacs
b. Internal iliacs
c. Common iliacs
d. Ovarian/testicular

C. Pelvic organs
1. Urinary bladder
a. Ureter
b. Urethra
2. Small intestine
a. Terminal ilium and ileocecal valve
3. Colon
a. Ascending
b. Descending
c. Sigmoid
d. Rectum
e. Vermiform appendix
4. Female reproductive organs
a. Vagina
b. Cervix
c. Uterus
d. Fallopian tubes
e. Ovaries
5. Male reproductive organs
a. Testes/scrotum
b. Prostate gland
c. Seminal vesicles
d. External to pelvis
1) Penis

VI. Musculoskeletal

A. Upper extremities
1. Shoulder
a. Bony anatomy
1) Clavicle
2) Scapula
3) Humerus
4) Acromioclavicular joint
b. Muscles and tendons
1) Deltoid
2) Supraspinatus
3) Infraspinatus
4) Teres minor

5) Subscapularis
6) Supraspinatus tendon
7) Biceps tendon

c. Labrum and ligaments
1) Glenoid labrum
2) Glenohumeral ligaments
3) Coracoacromial ligament
4) Coracoclavicular ligaments
5) Bursa (subacromial and subdeltoid)

d. Vascularity

2. Elbow

a. Bony anatomy
1) Humerus
2) Radius
3) Ulnar

b. Muscles and tendons
1) Anterior group
2) Posterior group
3) Lateral group
4) Medial group

c. Ligaments
1) Ulnar collateral
2) Radial collateral
3) Annular

d. Neurovasculature
1) Brachial artery
2) Radial artery
3) Ulnar artery
4) Basilic vein
5) Cephalic vein
6) Median cubital vein
7) Ulnar nerve

3. Hand and wrist

a. Bony anatomy

b. Phalanges

c. Metacarpals
1) Carpal bones
2) Radius
3) Ulnar

d. Tendons
1) Palmar tendon group
2) Dorsal tendon group
3) Triangular fibrocartilage complex

e. Neurovascular
1) Ulnar artery
2) Ulnar nerve

3) Radial artery
4) Median nerve

B. Lower Extremities
1. Hip
a. Bony anatomy
b. Labrum and ligaments
c. Muscle groups
d. Neurovasculature
2. Knee
a. Bony anatomy
b. Menisci and ligaments
c. Muscles
d. Vasculature
3. Foot and Ankle
a. Bony anatomy
b. Ligaments
c. Tendons
d. Muscles

Radiologic Science Resources

This list of radiologic science resources will assist educators in sampling the pool of references and study materials that pertain to medical radiography. The resources list should be viewed as a snapshot of available materials. Omission of any one title is not intentional. Because the creation of literature and media related to the field is dynamic, educators are encouraged to search additional sources for recent updates, revisions and additions to this collection of titles.

Textbooks

American Association of Physicists in Medicine. An Exposure Indicator for Digital Radiography. Report of AAPM Task Group 116. www.aapm.org/pubs/reports/RPT_116.pdf. Published July 2009.

American Association of Physicists in Medicine. Acceptance Testing and Quality Control of Photostimulable Storage Phosphor Imaging Systems. Report of AAPM Task Group 10. www.aapm.org/pubs/reports/RPT_93.pdf. Published October 2006.

Acello B. *Patient Care: Basic Skills for the Health Care Provider*. Albany, NY: Delmar Thomson Learning; 2000.

Adler AM, Carlton R. *Introduction to Radiography and Patient Care*. 4th ed. St. Louis, MO: Elsevier Saunders; 2007.

Adler AM, Carlton R, Poelhuis DJ, Kowalczyk NK. *Workbook W/Lab Exercises for Principles of Radiographic Imaging*. 4th ed. Albany, NY: Delmar Thomson Learning; 2006.

Adolina VF, Lille SL. *Mammographic Imaging: A Practical Guide*. 3rd ed. Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins Health; 2010.

Applegate E. *The Sectional Anatomy Learning System: Concepts and Applications*. 3rd ed. St. Louis, MO: Saunders/Elsevier; 2010

Biedrzycki A. *The Radiography Procedure and Competency Manual*. 2nd ed. Philadelphia, PA: F.A. Davis; 2008.

Blickman H. *Pediatric Radiology*. 3rd ed. St. Louis, Mo: Mosby-Year Book Inc; 2009.

Bonnick SL. *Bone Densitometry in Clinical Practice: Application & Interpretation*. New York, NY: Springer; 2009.

Bontrager K, Lampignano J. *Pocket Atlas-Handbook of Radiographic Positioning and Techniques*. 7th ed. St. Louis, MO: Elsevier Mosby; 2010.

Bontrager K. *Radiographic Positioning and Related Anatomy*. 7th ed. St. Louis, MO: Elsevier Mosby; 2009.

Bontrager K, Lampignano J. *Workbook and Laboratory Manual*, 7th ed. Volumes I and II. St. Louis, MO: Elsevier Mosby; 2009.

Bracco Diagnostics Inc. *Life-Saving Lessons in Myelography*. Bracco Diagnostics Inc; 1999.

Brennan P, Seeram E. *Digital Radiography.* Ames, IA: Blackwell Publishing Professional; 2007.

Browne MN, Keeley SM. *Asking the Right Questions: A Guide to Critical Thinking*. 9th ed. Upper Saddle Rivers, NJ: Prentice Hall; 2010.

Bushberg JT, et al. *The Essential Physics of Medical Imaging*. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2002.

Bushong SC. *Magnetic Resonance Imaging: Physical and Biological Principles.* 3rd ed. St. Louis, MO: Mosby; 2003.

Bushong SC. *Mosby's Radiography Online: Radiobiology and Radiation Protection.* 9th ed. St. Louis, MO: Mosby; 2008.

Bushong SC. *Mosby's Radiography Online: Radiographic Imaging.* 9th ed. St. Louis, MO: Mosby; 2008.

Bushong SC. *Mosby's Radiography Online: Radiologic Physics.* 9th ed. St. Louis, MO: Mosby; 2008.

Bushong SC. *Radiologic Science for Technologists: Physics, Biology, and Protection.* 8th ed. St. Louis, MO: Mosby; 2001.

Bushong SC. *Radiologic Science for Technologists Workbook and Laboratory Manual*. 9th ed. St. Louis, MO: Mosby; 2008.

Shier D, Butler J, Lewis R. *Hole's Human Anatomy & Physiology*. 12th ed. Boston, MA: McGraw-Hill Higher Education; 2009.

Callaway WJ. *Mosby's Comprehensive Review of Radiography.* 6th ed. St. Louis, MO: Elsevier/Mosby; 2012.

Callaway WJ, Gurley LT. *Introduction to Radiologic Technology.* 7th ed. St. Louis, MO: Elsevier/Mosby; 2010.

Campeau F, Fleitz J. *Limited Radiography.* 3rd ed. Albany, NY: Delmar Publishers, Inc; 2009.

Carlton RR, Adler AM. *Principles of Radiographic Imaging: An Art and a Science.* 4th ed. Albany, NY: Delmar Publishers; 2006.

Carlton RR, Greathouse JS. *Delmar's Principles of Radiographic Positioning & Procedures Pocket Guide*. Albany, NY: Delmar Publishers; 2005.

Carroll QB. *Fuch's Radiographic Exposure, Processing, and Quality Control*. 7th ed. Springfield, IL: Charles C. Thomas; 2003.

Carter C, Vealé B. *Digital Radiography and PACS*. 1st ed. revised. St. Louis, MO: Mosby/Elsevier; 2009.

Chabner DE. *The Language of Medicine*. 7th ed. Philadelphia, PA: W.B. Saunders; 2004.

Cummings GR, Meizner E. *Corectec's Comprehensive Set of Review Questions for Radiography*. 5th ed. Athens, GA: Corectec; 2005.

Dahnert W. *Radiology Review Manual*. 7th ed. Philadelphia, PA: Williams & Wilkins; 2011. ISBN 1609139437

Daldrup-Link HE, Gooding CA. *Essentials of Pediatric Radiology: A Multimodality Approach*. New York, NY: Cambridge University Press; 2010.

Davidhizar RE, Newman Giger J. (editors). *Transcultural Nursing: Assessment & Intervention*. 5th ed. St. Louis, MO: Mosby; 2007.

DeMaio D. *Mosby's Exam Review for Computed Tomography*. 2nd ed. St. Louis, MO: Mosby Elsevier; 2011

Diestler S. *Becoming a Critical Thinker: A User Friendly Manual*. 4th ed. Upper Saddle River, NJ: Prentice Hall; 2008.

Diller JV. *Cultural Diversity: A Primer for the Human Services*. 4th ed. Belmont, CA: Brooks/Cole, Cengage Learning; 2011.

Drafke MW, Nakayama H. *Trauma and Mobile Radiography*. 2nd ed. Philadelphia, PA: F.A. Davis; 2001.

Dreyer KJ, Mehta A, Thrall JH, Hisrchorn DS, eds. *PACS – A Guide to the Digital Revolution*. 2nd ed. New York, NY: Springer; 2005.

Eisenberg RL, Johnson NM. *Comprehensive Radiographic Pathology*. 4th ed. St. Louis, MO: Mosby; 2007.

Eisenberg RL, Johnson NM. *Workbook for Comprehensive Radiographic Pathology*. 4th ed. St. Louis, MO: Mosby; 2007.

Erlich RA, Daly JA. *Patient Care in Radiography: With an Introduction to Medical Imaging*. 7th ed. St. Louis, MO: Mosby; 2008.

Erkonen WE, Smith WL, eds. *Radiology 101: The Basics and Fundamentals of Imaging.* 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2009.

Fauber TL. *Radiographic Imaging & Exposure*. 3rd ed. St. Louis, MO: Mosby; 2008.

Forshier S. *Essentials of Radiation: Biology and Protection*. 2nd ed. Clifton Park, NY: Delmar; 2008.

Fosbinder RA, Mason S. *Essentials of Radiologic Science*. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2011

Fosbinder RA, Orth D. *Essentials of Radiologic Science*. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2011

Frank ED, Long BW, Smith BJ. *Merrill's Atlas of Radiographic Positions & Radiologic Procedures.* 12th ed. St. Louis, MO: Elsevier/Mosby; 2012.

Frank ED, Long BW, Smith BJ. *Merrill's Pocket Guide to Radiography.* 7th ed. St. Louis, MO: Mosby; 2011.

Frank ED, Long, BW, Smith, BJ. *Mosby's Radiography Online: Anatomy and Positioning for Merrill's Atlas of Radiographic Positioning & Procedures.* 12th ed. St. Louis, MO: Mosby; 2011.

Frank ED, Long BW, Smith BJ, Hall Rollins J. *Workbook for Merrill's Atlas of Radiographic Positions & Radiologic Procedures.* 12th ed. St. Louis, MO: Mosby; 2012.

Gollnick DA. *Basic Radiation Protection.* 4th ed. Altadena, CA: Pacific Radiation Corp.; 2000.

Graham D, Cloke P, Vosper M. *Principles of Radiological Physics*. 5th ed. New York, NY: Churchill Livingstone; 2006.

Gunn C. *Digital and Radiographic Imaging: A Practical Approach.* 4th ed. New York, NY: Churchill Livingstone; 2008

Gurley LT, Callaway WJ. *Introduction to Radiologic Technology*. 7th ed. St. Louis, MO: CV Mosby; 2010.

Guy JF. *Learning Human Anatomy: A Laboratory Text and Workbook.* 3rd ed. Upper Saddle River, NJ: Pearson Prentice Hall; 2008.

Gylys BA, Masters RM. *Medical Terminology Simplified: A Programmed Learning Approach by Body System*. 4th ed. Philadelphia, PA: F.A. Davis Co.; 2009.

Hall EJ, Giaccia AJ. *Radiobiology for the Radiologist*. 6th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005.

Hardy M, Snaith B. *Musculoskeletal Trauma: A Guide to Assessment and Diagnosis*. Edinburgh, UK: Churchill Livingstone; 2010.

Harvey CP, Allard MJ. *Understanding and Managing Diversity: Readings, Cases, and Exercises*. 4th ed. Upper Saddle River, NJ: Prentice Hall; 2008.

Haus AG. *Advances in Film Processing Systems Technology and Quality Control in Medical Imaging*. Madison, WI: Medical Physics Pub Corp; 2001.

Hayes S. *Radiographic Anatomy, Positioning Procedures Workbook Set.* 3rd ed. St. Louis, MO: Mosby; 2003.

Hendee WR, Ritenour ER. *Medical Imaging Physics*. 4th ed. Hoboken, NJ: Wiley-Liss; 2002.

Huang HK. *PACS and Imaging Informatics*. 2nd ed. Hoboken, NJ: Wiley-Liss; 2010.

Huda W, Slone RM. *Review of Radiologic Physics*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2009.

Hughes W. *Critical Thinking: An Introduction to the Basic Skills*. 3rd ed. Peterborough, Ontario: Broadview Press; 2000.

Jensen SC, Peppers MP. *Pharmacology and Drug Administration for Imaging Technologists.* 2nd ed. St. Louis, MO: CV Mosby; 2006.

Johnston J, Fauber TL. *Essentials of Radiographic Physics and Imaging*. St. Louis, MO: Mosby; 2011.

Juhl JH. *Paul & Juhl's Essentials of Radiologic Imaging.* 7th ed. Philadelphia, PA: JB Lippincott Company; 1998.

Kelley LL, Peterson CM. *Sectional Anatomy for Imaging Professionals* 2nd ed. St. Louis, MO: Mosby; 2007

Kelley LL, Peterson CM. *Workbook for Sectional Anatomy for Imaging Professionals.* 2nd ed. St. Louis, MO: Mosby; 2007.

Kowalczyk N, Mace JD. *Radiographic Pathology for Technologists*. 5th ed. St. Louis, MO: Mosby/Elsevier; 2008.

LaGuardia D, Guth HP. *American Voices: Culture and Community*. 6th ed. Mountain View, CA: Mayfield Publishing Co.; 2006.

Lazo DL. *Fundamentals of Sectional Anatomy*. Clifton Park, NJ: Thomson Delmar Learning; 2005.

Lufkin R. *Teaching Atlas of Head & Neck Imaging*. New York, NY: Thieme Medical Publishers; 2002.

McCance KL, Huether SE. *Pathophysiology: The Biologic Basis for Disease in Adults and Children*. 6th ed. Maryland Heights, MO: Mosby Elsevier; 2009.

McQuillen Martensen K. *Radiographic Image Analysis*. 3rd ed. Philadelphia, PA: Elsevier/Saunders; 2011.

Madden ME. *Introduction to Sectional Anatomy*. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007.

Madden ME. *Sectional Anatomy Review*. Philadelphia, PA: Lippincott, Williams &Wilkins; 2001.

Marieb EN, Hoehn K. *Human Anatomy & Physiology*. 8th ed. San Francisco, CA: Benjamin Cummings; 2010

Martin JE. *Physics for Radiation Protection*. 2nd ed. Weinheim, Germany: Wiley-VCH; 2006.

Meistrich ML. *Radiation Protection Guidance*. Bethesda, MD: National Council on Radiation Protection and Measurements; 2000.

Mettler FA, Upton AC. *Medical Effects of Ionizing Radiation*. 3rd ed. Philadelphia, PA: Saunders/Elsevier; 2008.

Mulvihill ML, et al. *Human Disease: A Systemic Approach*. 7th ed. Upper Saddle River, NJ : Pearson Education; 2009.

NCRP Reports - www.ncrppublications.org. Bethesda, MD: National Council on Radiation Protection and Measurements.

Nosich GM. *Learning to Think Through: A Guide to Critical Thinking Across the Curriculum*. 3rd ed. Upper Saddle River, NJ: Prentice Hall; 2008.

Oakley J. *Digital Imaging: A Primer for Radiographers, Radiologists and Health Care Professionals*. NY: Cambridge University Press; 2003.

O'Neil SL, Chapman EN. *Your Attitude is Showing*. 12th ed. Upper Saddle River, NJ: Pearson Prentice Hall; 2007.

Papp J. *Quality Management in the Imaging Sciences*. 4th ed. St. Louis, MO: Mosby Elsevier; 2011.

Parelli RJ. *Medicolegal Issues for Radiographers.* 4th ed. Boca Raton, FL: CRC Press/Taylor & Francis Group; 2008.

Pianykh OS. *Digital Imaging and Communications in Medicine (DICOM): A Practical Introduction and Survival Guide*. NY, NY: Springer; 2010

Perkins M. *The Practical Guide to Digital Imaging: Mastering the Terms, Technologies, and Techniques*. Buffalo, NY: Amherst Media; 2005.

Poelhuis DJ, Kowalczyk N, Carlton R, Adler AM. *Workbook W/Lab Exercises for Principles of Radiographic Imaging.* 4th ed. Albany, NY: Delmar Publishers; 2005.

Purtilo RB, Doherty R. *Ethical Dimensions in the Health Professions.* 5th ed. St. Louis, MO: Elsevier/Saunders; 2010.

Reiner BI, Siegel EL, Carrino JA. *Quality Assurance: Meeting the Challenge in the Digital Medical Enterprise.* Society for Computer Applications in Radiology (SCAR); 2002.

Ruggiero VR. *Becoming a Critical Thinker.* 6th ed. Boston, MA: Houghton Mifflin; 2008.

Saia DA. *Appleton & Lange's Review for the Radiography Examination.* 4th ed. New York, NY: McGraw-Hill/Appleton & Lange; 2000.

Saia DA. *Radiography PREP: Program Review & Exam Preparation.* 6th ed. New York, NY: McGraw-Hill; 2011.

Samei E, Flynn MJ, eds. *2003 Syllabus, Advances in Digital Radiography: Categorical Course in Diagnostic Radiology Physics*. Oak Brook, IL: Radiological Society of North America; 2003.

Savader S, Trerotola S. *Venous Interventional Radiology with Clinical Perspectives*. New York, NY: Thieme Medical Publishers Inc; 2000.

Schwartz, SE, Conley C. *Human Diversity: A Guide for Understanding.* 4th ed. New York, NY: McGraw-Hill; 2000.

Seeram E. *Computed Tomography: Physical Principles, Clinical Applications, and Quality Control.* 3rd ed. Philadelphia, PA: Saunders; 2009.

Seeram E. *Digital Radiography: An Introduction for Technologists.* Clifton Park, NY: Delmar Cengage Learning; 2011

Seeram E. *Rad Tech's Guide to Radiation Protection.* Malden, MA: Blackwell Science; 2001.

Shephard C. *Radiographic Image Production and Manipulation.* New York, NY: McGraw-Hill; 2002.

Sickles Corbett NA. *Student Study Guide to Accompany Hole's Human Anatomy & Physiology.* 10th ed. Boston, MA: McGraw-Hill Higher Education; 2003.

Snopek AM. *Fundamentals of Special Radiographic Procedures.* 5th ed. Philadelphia, PA: WB Saunders; 2006.

Spector RE. *Cultural Diversity in Health & Illness.* 7th ed. Upper Saddle River, NJ: Pearson Prentice Hall; 2008.

Squire LF, Novelline RA. *Fundamentals of Radiology.* 6th ed. Cambridge, MA: Harvard University Press; 2004.

Statkiewicz-Sherer MA. *Workbook for Radiation Protection in Medical Radiography.* 6th ed. St. Louis, MO: Mosby; 2011.

Statkiewicz-Sherer MA, Visconti PJ, Ritenour ER. *Radiation Protection in Medical Radiography.* 6th ed. Maryland Heights, MO: Mosby Elsevier; 2010.

Swartz JD, Loevner L. *Imaging of the Temporal Bone.* 4th ed. New York, NY: Thieme Medical Publishers, Inc.; 2008.

Torres LS, Dutton AG, Linn-Watson Norcutt TA. *Basic Medical Techniques & Patient Care in Imaging Technology.* 7th ed. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2009.

Tortorici M. *Advanced Radiographic and Angiographic Procedures: With an Introduction to Specialized Imaging.* Philadelphia, PA: F.A. Davis; 2010.

Towsley-Cook DM, Young TA. *Ethical and Legal Issues for Imaging Professionals.* 2nd ed. St. Louis, MO: Mosby; 2007

Venes D. *Taber's Cyclopedic Medical Dictionary.* 21st ed. Philadelphia, PA: F.A. Davis; 2009.

White L. *Critical Thinking in Practical/Vocational Nursing.* Albany, NY: Delmar/Thomson Learning; 2002.

Wicke L. *Atlas of Radiologic Anatomy.* 7th ed. Teterboro, NJ: Icon Learning Systems; 2004

Willis MC. *Medical Terminology: A Programmed Learning Approach to the Language of Health Care.* 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007.

Wilson RL. *Chiropractic Radiography & Quality Assurance Handbook.* Boca Raton, FL: CRC Press; 2000.

Wolbarst AB. *Physics of Radiology.* 2nd ed. Madison, WI: Medical Physics; 2005.

Yochum TR, Rowe LJ. *Essentials of Skeletal Radiology.* 3rd ed. Philadelphia, PA: Lippincott/Williams & Wilkins; 2004.

Journals

Applied Radiology. Anderson Publishing Ltd, Ocean, NJ.

Diagnostic Imaging. United Business Media, San Francisco, CA.

Journal of Medical Imaging and Radiation Sciences. Published by Elsevier for the Canadian Association of Medical Radiation Technologists (CAMRT).

Journal of Vascular Technology. Society of Vascular Technology, Lanham, MD.

Radiography. The College of Radiographers, St. Louis, MO.

Radiologic Science and Education. Association of Educators in Imaging and Radiological Sciences, Albuquerque, NM.

Radiologic Technology. American Society of Radiologic Technologists, Albuquerque, NM.

Radiology. Radiological Society of North America, Oak Brook, IL.

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Shawn Leatherwood	September 17, 2013 Items will be considered late if submitted after 4:30 p.m. and less than: ▪ 10 work days before the meeting for Medical Board ▪ 08 work days before the meeting for all others

3) Name of Board, Committee, Council, Sections:
Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	Pod 1.01 X-ray by unlicensed personnel

7) Place Item in:	8) Is an appearance before the Board being scheduled? If yes, who is appearing?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes by (name) ☒ No	N/A

10) Describe the issue and action that should be addressed:

Board will discuss the rule and approve the revisions of s. Pod 1 relating to x-ray examinations by persons under the direct supervisions of a podiatrist for submission to the Clearinghouse.

11) Authorization

Shawn Leatherwood — September 17, 2013

Signature of person making this request — Date

Supervisor (if required) — Date

Bureau Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Board Services Bureau Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

STATE OF WISCONSIN
PODIATRY AFFILIATED CREDENTIALING BOARD

IN THE MATTER OF RULE-MAKING PROCEEDINGS BEFORE THE PODIATRY AFFILIATED CREDENTIALING BOARD	:	PROPOSED ORDER OF THE PODIATRIST AFFILIATED CREDENTIALING BOARD ADOPTING RULES (CLEARINGHOUSE RULE)

PROPOSED ORDER

An order of the Podiatry Affiliated Credentialing Board to create Pod 1.02 (2m), Pod 1.02 (6m) and Pod 7 (title) relating to podiatric x-ray assistants.

Analysis prepared by the Department of Safety and Professional Services.

ANALYSIS

Statutes interpreted:

s. 462.02 (1) (f), Stats.

Statutory authority:

ss. 227.11 (2) (a), 448.695 (3), Stats.

Explanation of agency authority:

Pursuant to s. 227.11 (2) (a), the Podiatrist Affiliated Credentialing Board (Board) is generally empowered by the legislature to promulgate rules that will provide guidance within the profession and rules that interpret the statutes it enforces or administers. Section 448.695 (3), Stats., specifically empowers the Board to, "promulgate rules specifying the requirements for a course of instruction related to x-ray examinations by persons under the direct supervision of a podiatrist. . ." The proposed rule seeks to carry out that mandage by specifying the necessary course of instruction for persons under the direct supervision of a podiatrist. Therefore, the Board is empowered both generally and specifically to promulgate the proposed rule.

Related statute or rule:

Wis. Admin. Code s. Pod 1

Plain language analysis:

The proposed rule deals with the requirements for a course of instruction related to x-ray examinations by persons under the direct supervision of a podiatrist. Generally, a person who practices radiography is required to be credentialed by the Radiography Examining Board. However, under s. 462.02 (2) (f), Stats., if a person is under the direct supervision of a podiatrist and has successfully completed a course of instruction approved by the Podiatrists Affiliated Credentialing Board they are not required to have a permit to conduct radiography. Pursuant to s. 448.695 (3), the Board is authorized to promulgate rules that identify the specific courses a person who is under the direct supervision of a podiatrist must complete in order to be qualified to conduct podiatric x-ray examinations. The statue also requires the Podiatry Examining Board to consult with the Radiography Examining Board in drafting the proposed course of instruction .

Summary of, and comparison with, existing or proposed federal regulation:

The Consumer-Patient Radiation Health & Safety Act of 1981, 42 USC 1001, et seq. establishes federal guidelines for standards of accreditation of educational programs for certain occupations that administer radiologic procedures. The standards are in place to protect the public from excessive exposure to radiation by health care professionals who most often use radiation in the treatment of disease or other medical conditions. The regulations are directed towards radiographers, dental hygienists, dental assistants, nuclear medicine technologists, and radiation therapy technologists.

42 USC § 10003 (5) broadly defines, "persons who administer radiologic procedures" means any person, other than a practitioner, who intentionally administers radiation to other persons for medical purposes and includes medical radiologic technologists (including dental hygienists and assistants), radiation therapy technologists and nuclear medicine technologists." 42 CFR 75.2 defines radiation therapy technologist as, "a person other than a licensed practitioner who utilizes ionizing radiation-generating equipment for therapeutic purposes on human subjects." Although non-licensed personnel who assist podiatrists, the topic of these proposed rules, are not specifically addressed, they could be captured under the broad definition of radiation therapy technologists. The federal statute and regulation are comparable to the proposed rule in that they both set forth the education and credentialing standards for the aforementioned professions.

Comparison with rules in adjacent states:

Illinois: Illinois regulates radiologist assistants and limited diagnostic radiographers who pass the American Registry of Radiologic Technologists (ARRT). Radiologist assistants must also pass the Certification Board for Radiology Practitioner Assistants (CBRPA) exam. Ill Admin. Code tit. 32 §401.70

Iowa: Iowa defines a podiatric X-ray equipment operator as one who "performs radiography of only the foot and ankle using dedicated podiatric equipment". IAC 641-42.2 (136C). Podiatric X-ray equipment operators must obtain "8.0 hours of classroom instruction to include radiation safety, equipment operation, patient care and anatomy."

Michigan: Michigan does not regulate podiatric x-ray assistants.

Minnesota: Minnesota regulates limited x-ray operators. They may only practice medical radiography on limited regions of the body as long as he or she has successfully passed the American Registry of Radiologic Technologists (ARRT) exam, or the American Chiropractic Registry of Radiologic Technologists (ACRRT) exam. Minn. Stats. 144.121 subd. 5a.

Summary of factual data and analytical methodologies:

The Board ensures the accuracy, integrity, objectivity and consistency of the data used in preparing the proposed rule and related analysis.

Analysis and supporting documents used to determine effect on small business or in preparation of economic impact analysis:

These proposed rules do not have an economic impact on small businesses, as defined in s. 227.114 (1), Stats. The Department's Regulatory Review Coordinator may be contacted by email at Greg.Gasper@wisconsin.gov, or by calling (608) 266-8608

Fiscal Estimate and Economic Impact Analysis:

The Fiscal Estimate and Economic Impact Analysis are attached.

Effect on small business:

These proposed rules do not have an economic impact on small businesses, as defined in s. 227.114 (1), Stats. The Department's Regulatory Review Coordinator may be contacted by email at Greg.Gasper@wisconsin.gov, or by calling (608) 266-8608.

Agency contact person:

Shawn Leatherwood, Department of Safety and Professional Services, Division of Policy Development, 1400 East Washington Avenue, Room 151, P.O. Box 8935, Madison, Wisconsin 53708; telephone 608-261-4438; email at Shancethea.Leatherwood@wisconsin.gov.

Place where comments are to be submitted and deadline for submission:

Comments may be submitted to Shawn Leatherwood Department of Safety and Professional Services, Division of Policy and Development, 1400 East Washington

Avenue, Room 151, P.O. Box 8935, Madison, WI 53708-8935, or by email to Shancethea.Leatherwood@wisconsin.gov. Comments must be received on or before _____to be included in the record of rule-making proceedings.

TEXT OF RULE

SECTION 1. Pod 1.02 (2m) is created to read:

Pod 1.02 (2m) "Direct supervision" means a physician has assumed responsibility for directing, supervising, and inspecting the work of the person being supervised and the supervising physician is physically present on the same premises as the person being supervised, with face-to-face contact as necessary.

SECTION 2. Pod 1.02 (6m) is created to read:

Pod 1.02 (6m) "Podiatric x-ray assistant" means a person who is under the direct supervision of a licensed podiatric physician to perform only those radiographic functions that are within the scope of practice of a podiatric physician licensed under s. 448.61, Stats., and the podiatric physician is competent to perform.

SECTION 3. Pod 7 (title) is created to read:

CHAPTER POD 7
PODIATRIC X-RAY ASSISTANT

Pod 7.01 Podiatric x-ray assistant under direct supervision of a podiatrists. A podiatric physician may not delegate x-ray tasks to an unlicensed person unless the delegate has successfully completed a course of instruction for podiatric x-ray assistants approved by the board. Patients must be informed that the podiatric x-ray assistant is practicing under the supervision of the podiatric physician. A course of instruction for podiatric x-ray assistants is approved by the board if all of the following are true:

(1) The instructor is a physician or radiographer whose license to practice in Wisconsin is current and unlimited.

(2) The program consists of at least 8 hours of instruction.

(3) The course of instruction addresses; and attendees demonstrate knowledge and understanding of all of the following topics:

(a) terminology

(b) science of radiation in x-rays

(c) radiation exposure and monitoring including dose limits for exposure to ionizing radiation.

(d)health risks of radiation exposure

(e)safety techniques to minimize radiation exposure to staff and patients as low as reasonably achievable (ALARA)

(f) anatomy and function of foot and leg

(e) positioning for podiatric x-rays

(g) equipment operation technique and quality control, including analog and digital

(h) infection control

(i) legal and ethical issues

(4) A podiatric physician who uses the services of a podiatric x-ray assistant shall keep at each practice site, a copy of documentation that the podiatric x-ray assistant satisfactorily completed a course of instruction that meets the requirements set out above.

SECTION 4. EFFECTIVE DATE. The rules adopted in this order shall take effect on the first day of the month following publication in the Wisconsin administrative register, pursuant to s. 227.22 (2) (intro.), Stats.

(END OF TEXT OF RULE)

Dated _____ Agency _____

Chairperson
Podiatry Affiliated Credentialing Board

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Karen Rude-Evans, Bureau Assistant, **On Behalf of Executive Director Tom Ryan**	**9/12/2013** Items will be considered late if submitted after 4:30 p.m. on the deadline date: ▪ 8 business days before the meeting for paperless boards ▪ 14 business days before the meeting for all others

3) Name of Board, Committee, Council, Sections:

Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	**Correpondence from Jason Boudreau, DPM - Board Discussion of Possible Rule Writing**

7) Place Item in:	8) Is an appearance before the Board being scheduled?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes (Fill out Board Appearance Request) ☒ No	

10) Describe the issue and action that should be addressed:

Review correspondence and discussion of possible rule writing.

11) Authorization

Karen Rude-Evans

Signature of person making this request — Date

Supervisor (if required) — Date

Executive Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Policy Development Executive Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

Revised 8/13

WISCONSIN
FOOT & ANKLE
www.wifootandankle.com
William Weis, DPM

Board Certified, American Board of Podiatric Surgery

Wound Specialist

Fellow, American College of Foot and Ankle Surgeons

331 East Puetz Road, Suite 105
Oak Creek, Wisconsin 53154
(414) 768-9933

6754 Linderman Ave.
Racine, Wisconsin 53405
(262) 633-3899

St. Luke's Medical Center
(414) 768-9933

Jason Boudreau, DPM
2311 N. Prospect Ave. 4A
Milwaukee, WI 53211

September 25, 2013

Dear Dr. Boudreau,

Thank you for your email from August 26 regarding your inquiry into the podiatry scope of practice.

I have consulted with the Department of Safety and Professional Services (DSPS) staff. In the name of transparency and objectivity the DSPS position is that a ruling or policy statement by the Podiatrist Affiliated Credentialing Board (PACB) regarding whether a treatment is within a DPM's scope of practice would be governed under the following rules:

> Wis. Stat. § 227.10(2m) requires an explicit grant of authority under statute or administrative rule before a state agency can implement or enforce any standard, requirement, or threshold, including as a term or condition of any license issued by the agency; and
>
> Wis. Stat. §§ 227.11(2)(a)1. to 3. defines agency authority to promulgate administrative rules, specifically providing the following (in part):
>
> A statutory or non-statutory provision containing a statement or declaration of legislative intent, purpose, findings, or policy does not confer rulemaking authority on the agency or augment the agency's rulemaking authority beyond the rulemaking authority that is explicitly conferred on the agency by the legislature.
>
> • A statutory provision describing the agency's general powers or duties does not confer rulemaking authority on the agency or augment the agency's rulemaking authority beyond the rulemaking authority that is explicitly conferred on the agency by the legislature.
>
> • A statutory provision containing a specific standard, requirement, or threshold does not confer on the agency the authority to promulgate, enforce, or administer a rule that contains a standard, requirement, or threshold that is more restrictive than the standard, requirement, or threshold contained in the statutory provision.

For this reason, the department has instructed <u>all</u> boards not to engage in this practice. Governor Walker's Executive Order 50 from 2011 dictates that a scope issue can be definitively addressed only through a statute or administrative rule.

I will put the issue of rule changes on the agenda for the next PACB meeting, but we will not address specific action regarding scope of practice issues or begin a rule making process.

Please consult your individual health care attorney for guidance.

Sincerely,

William Weis, DPM
Chair, Podiatrist Affiliated Credentialing Board

CC: Thomas Ryan
Executive Director
Department of Safety and Professional Services

August 26, 2013

VIA EMAIL TO wifootandankle@sbcglobal.net
AND FIRST CLASS MAIL

Dr. William Weis
Chairperson – Wisconsin Podiatry Affiliated Credentialing Board
State of Wisconsin
Department of Safety and Professional Services
PO Box 8935
Madison, WI 53708-8935

RE: Scope of practice inquiry

Dear Dr. Weis:

A question has come up about whether I can supervise certain treatments within the scope of my license to practice podiatric medicine and surgery in Wisconsin. I therefore would appreciate your guidance regarding my ability to provide this requested care and not be at risk of violating the Wisconsin Podiatry Practice Act.

Enclosed please find my curriculum vitae for your review. (Attachment 1) I have successfully completed a three year residency, am Board-certified for many years and have long-standing full-scope of practice hospital staff privileges at three Wisconsin hospitals. I've been licensed by the State of Wisconsin for 16 years and, during that time, I am aware of no complaints against me or investigations about me by the Podiatry Affiliated Credentialing Board (PACB). Furthermore, I am aware of no malpractice claims pending against me.

In my professional experience, I have worked with other health care providers for seven years to provide a significant number of patients with beneficial and cost-effective hyperbaric oxygen treatment for lower extremity wounds. As the attached curriculum vitae indicates, I currently have privileges at the Columbia St. Mary's Hospital Milwaukee Wound Healing Center. I am a Certified Wound Care Specialist (CWS) through the American Academy of Wound Management and I have completed training in wound management and hyperbaric medicine. Recently, I have been asked by hospital administrators, clinic directors, colleagues and others to supervise the hyperbaric oxygen therapy provided by skilled technicians.

As you know, Wis. Stat. § 448.60(4) of the Podiatry Practice Act defines a doctor of podiatric medicine and surgery's scope of practice. Under it, podiatry means that branch or system of the practice of medicine and surgery that involves treating the sick which is limited to conditions affecting the foot and ankle, but does not include the use of a general anesthetic unless administered by or under the direction of a person licensed to practice medicine and surgery under subchapter II of chapter 448. The practice of medicine and

surgery is defined by Wis. Stat. § 448.01(9)(a) of the Medical Practice Act as "to examine into the fact, condition or cause of human health or disease, or to treat, operate, prescribe or advise for the same, by any means or instrumentality." Additionally, Wis. Stat. § 448.01(10) defines treating the sick as examining "into the fact, condition or cause of human health or disease, or to treat, operate, prescribe or advise for the same..." By allowing treatment by "any means or instrumentality," the Legislature has chosen not to place statutory limits on the treatment options available to MDs, DOs and doctors of podiatric medicine and surgery. Instead, the Legislature has granted us latitude to rely on our expertise and training to treat patients within our scope of practice, as determined by the Medical Examining Board and the PACB. Fitting with this approach, the Wisconsin Podiatry Practice Act does not explicitly address whether a podiatric physician may supervise hyperbaric oxygen therapy. This is to be expected since the Practice Act, in accordance with Wis. Stat. § 448.01(9)(a), does not delineate or restrict any treatment options available to a doctor of podiatric medicine and surgery operating within his scope of practice. Podiatric physicians in Wisconsin routinely provide treatment for lower extremity non-healing wounds such as surgical debridement, edema control, vacuum dressings and the application of bioskins and skin grafts. Hyperbaric oxygen therapy is another widely accepted treatment for chronic non-healing wounds that, in Wisconsin, is provided by teams of health care professionals that often include doctors of podiatric medicine and surgery.

Thus, determining whether supervision of hyperbaric oxygen therapy is within a podiatric physician's scope of practice is not a matter of statutory interpretation. Instead, it requires consideration of whether the treatment is a medically established care option, whether doctors of podiatric medicine and surgery have the training, experience and demonstrated competence to supervise treatment, and whether the Board has regulatory authority over doctors of podiatric medicine and surgery providing this mode of treatment.

The use of hyperbaric oxygen therapy for medically-necessary care has been long recognized and accepted. In Wisconsin, this therapy is successfully used by MDs, DOs and doctors of podiatric medicine and surgery to treat chronic non-healing wounds. In these cases, it helps stimulate the growth of new blood vessels, which improves circulation and wound healing and it also fights certain types of infections. Particularly for doctors of podiatric medicine and surgery like me who practice in a hospital setting, hyperbaric oxygen therapy is among the treatments that we have participated in for many years. The standards of practice when providing hyperbaric oxygen therapy are constant regardless of who is supervising the treatment. Furthermore, if an emergency arises, the same treatment protocols apply regardless of whether an MD, DO or podiatric physician is providing the necessary supervision in a hospital or similar setting.

I have researched available education and training and have learned that it is recommended that supervision of hyperbaric oxygen therapy be provided by a qualified health care provider such as an MD, DO or a podiatric physician who has successfully completed a relevant course of study and subsequent continuing education. In addition to the American Board of Wound Management certification I have received, I am aware of one

offered by the American Board of Wound Healing. Information about these certifications is enclosed. (Attachments 2 and 3) In addition, continuing medical education in the subject area of hyperbaric oxygen therapy is readily available from the Undersea and Hyperbaric Medical Society (UHMS) and other organizations that are accredited by the Accreditation Council for Continuing Medical Education to offer continuing medical education (CME) courses. Information about training I have completed and copies of available CMEs in hyperbaric oxygen therapy are also enclosed, for your reference.

Under Wis. Stat. § 448.665, the Board can set specific continuing education requirements for doctors of podiatric medicine and surgery supervising hyperbaric oxygen therapy, if it chooses. Yet no changes or additions to § 448.665 are necessary to grant credit for those courses referenced above since they are approved by the Accreditation Council for Continuing Medical Education consistent with Wis. Admin. Code Pod. § 302. Moreover, the Board's existing authority under Wis. Stat. § 448.675 to initiate disciplinary proceedings for unprofessional or negligent conduct would include podiatric physicians supervising hyperbaric oxygen therapy, just as any other podiatric physicians providing wound care.

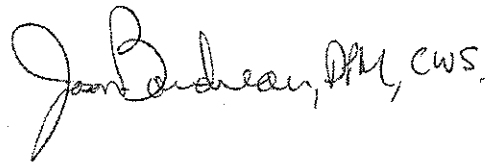
The Wisconsin PACB may advise doctors of podiatric medicine and surgery as to whether supervision of hyperbaric oxygen therapy is within the scope of their practice when treating lower extremity wounds. I note that the Board has previously issued position statements on scope of practice, maintenance of health care records and supervision of persons performing X-rays. Other states that allow the supervision of hyperbaric oxygen therapy by doctors of podiatric medicine and surgery (Connecticut, Nevada, New York, Pennsylvania, Tennessee, and Texas) do not explicitly include this treatment option in their practice acts. Instead, the licensing boards in all of these states but Texas, which adopted an administrative rule, have ruled on the issue via a policy statement or order of the board.

In Wisconsin, the promulgation of an administration rule is not required by statute and rules have not previously been used to address scope of practice issues for doctors of podiatric medicine and surgery or other health care professionals, including MDs and DOs. Wis. Stat. § 227.10 (1) provides that "each agency shall promulgate as a rule each statement of general policy and each interpretation of a statute which it specifically adopts to govern its enforcement or administration of that statute." Since, as noted above, the analysis of whether supervision of hyperbaric oxygen therapy is within a podiatric physician's scope of practice is not a matter of statutory interpretation, Wis. Stat. § 227.10 (1) is not applicable to my request.

In summary, hyperbaric oxygen therapy is a medically acceptable and proven treatment that I have the training, experience and demonstrated competence to supervise. Hyperbaric oxygen therapy is one of many wound care options available when treating non-healing lower extremity wounds and Board oversight of podiatric physicians supervising this treatment would not change or be restricted in any way. Supervising this necessary and effective treatment enables me to be responsive to the requests I have received and provide effective lower extremity wound care to the health care consumers in the communities where I practice.

If you need any additional information, please advise me and I will be most responsive.

Very truly yours,



Jason Boudreau, DPM
(414) 961-2434
jkboudi@yahoo.com

Attachments

cc: *(via email and first class mail, with attachments)*
Dr. Thomas Komp, PACB Vice Chairperson, tkomp@newbc.rr.com
Dr. Jeffery Giesking, PACB Podiatrist Member, giesking.jeffery@mayo.edu
Mr. Gary Brown, PACB Secretary, gbrown1947@att.net

Jason Kendell Boudreau, DPM, CWS, FACFAS
Columbia St. Mary's Hospital
Prospect Medical Commons
2311 N. Prospect Ave. Suite 4A
Milwaukee, WI. 53211
jkboudi@yahoo.com

Education:

Diabetic Limb Salvage Fellowship
Botsford General Hospital
Farmington Hills, Michigan
Affiliated with Michigan State University
July 2000-June 2001

Botsford General Hospital
Farmington Hills, Michigan
Affiliated with Michigan State University
Primary Podiatric Medical Residency (12 months of training)
Podiatric Surgical Residency (24 months of training)
Residency Director: Marshall G. Solomon, D.P.M., FACFAS
July 1997-June 2000

Dr. William M. Scholl College of Podiatric Medicine
Chicago, Illinois
Degree: Doctor of Podiatric Medicine (D.P.M.)
August 1993 to May 1997

University of California at Davis
Davis, California
Bachelor of Science in Biological Sciences
Graduation: June 1993

Honors and Scholarships:

***Milwaukee Magazine* Top Doctors 2008 & 2012 Podiatric Medicine & Surgery**
Certificate of Excellence 2000 Botsford General Hospital
Alvin Yarrows Memorial Award Second Place 1999
Dr. William M. Scholl College of Podiatric Medicine Swanson Foundation Independent Scholar Program. ***First Graduate of the Research Program 1997***
Merit Scholar Award 1994
Durlacher Honor Society 1993-1997 *Vice president 1996-1997*

Jason Kendell Boudreau, DPM, CWS, FACFAS
Columbia St. Mary's Hospital
Prospect Medical Commons
2311 N. Prospect Ave. Suite 4A
Milwaukee, WI. 53211
jkboudi@yahoo.com

Special Training:

Diversified Clinical Services Problem Wound Management Training
The Woodlands, Texas October 14-16th, 2007
Diversified Clinical Services Hyperbaric Medicine Training
The Woodlands, Texas October 14-16th, 2007
Rearfoot and Ankle Surgical Skills Course
Rosemont, Illinois August 19-20, 2006
Comprehensive Foot and Ankle Arthroscopy Surgical Skill Course
Rosemont, Illinois, December 2-3, 2006
Trauma of the Foot and Ankle Surgical Course
March 2000
AO ASIF Trained Basic and Advanced Courses
1998 & 2000
Arthroscopic Surgery of the Foot and Ankle Surgical Course with Holmium Laser Arthroscopy Training
December 1998
Basic Vascular Microsurgery Henry Ford Health System
1998
ACLS & BLS Training
Current
Pediatric Orthopedics
Washington D.C. Children's Hospital, Dr. Tosi
Baja Crippled Children's Project.
Dr. Bernard. Mexicali, Mexico

Work Experience

Columbia St. Mary's Hospital Milwaukee Wisconsin
October 2008 to present
Columbia St. Mary's Hospital Milwaukee Wound Healing Center
October 2007 to present
Whitefish Bay Foot & Ankle Clinic, LLC
December 2004 to October 2008
Hales Corners Foot & Ankle Center
July 2001 to October 2007
Czarnecki Podiatry, Mequon, WI (262) 242-0095, 2005-2006
Milwaukee Foot Specialists, Milwaukee, WI (414) 259-9698, 2003 to 2006
Waukesha Foot Specialists, Waukesha, WI. (262) 544-0700 2003 to 2006
Diabetic Limb Salvage Clinic VAMC-Detroit- Combined Podiatric Medicine and Vascular Surgery Department Clinic.
2000-2001
Diabetic Limb Salvage Clinic Botsford General Hospital
2000-2001
Botsford General Hospital*1997-2001*

Jason Kendell Boudreau, DPM, CWS, FACFAS
Columbia St. Mary's Hospital
Prospect Medical Commons
2311 N. Prospect Ave. Suite 4A
Milwaukee, WI. 53211
jkboudi@yahoo.com

Licenses and Certification:

Board Certified in Reconstructive/Rearfoot & Ankle Surgery. *September 2007*
Board Certified in Foot Surgery, American Board of Podiatric Surgery: *July 2005*
Certified Wound Care Specialist (CWS) American Academy of Wound Management. 2003
Board Qualified Reconstructive Rearfoot & Ankle Surgery, American Board of Podiatric Surgery: *July 2000*
Board Qualified in American Board of Podiatric Orthopedics and Primary Podiatric Medicine. *August 2002*
State of Wisconsin Doctor of Podiatric Medicine Number: 803-025
State of Michigan Podiatric Physician and Surgeon License Number: 5901001853
Basic Life Support: *Current*
Basic Microvascular Surgery Techniques
Foot and Ankle Arthroscopy
Holmium Laser Assisted Arthroscopy

Continuing Medical Education:

Over 50 CME per year. Midwest Podiatry Conference yearly, ACFAS Yearly, Cadaver Labs yearly. Submitted if requested.

Professional Organizations:

American Academy of Wound Management: Diplomat
American College of Foot and Ankle Surgeons: Fellow
American College of Foot and Ankle Orthopedics and Medicine: Associate
American Podiatric Medical Association: Member
Wisconsin Society of Podiatric Medicine: Member
Michigan Podiatric Medical Association: Member

Special Clinical Interests:

Diabetic Limb Salvage Procedures
Charcot Neuroarthropathy Reconstruction
Diabetic Lower Extremity Wound Care
Foot and Ankle Trauma & Reconstruction
Sports Medicine of the Foot and Ankle
Re-vascularization of the Lower Extremity/Vascular Surgery Techniques
Plastic Surgery Techniques Utilized on the Lower Extremity for Soft Tissue Closure
Surgical Reconstruction of the Rheumatoid Foot

Jason Kendell Boudreau, DPM, CWS, FACFAS
Columbia St. Mary's Hospital
Prospect Medical Commons
2311 N. Prospect Ave. Suite 4A
Milwaukee, WI. 53211
jkboudi@yahoo.com

Hospital Affiliations:

St. Mary's Hospital Ozaukee
13111 N. Port Washington Rd.
Mequon, WI. 53097
(262)243-7300

St. Mary's Milwaukee
2323 N. Lake Dr.Milwaukee, WI. 53211
(414) 291-1000

Orthopaedic Hospital of Wisconsin
575 W. River Woods Pkwy
Glendale, WI.
(414) 961-6800

River Woods Outpatient Center
375 W. River Woods Pkwy.
Glendale, WI. 53212
(414) 963-7100

http://www.aawm.org/

- ABWM Certified
- Board Certification

Board Certification

A healthcare professional with experience in wound management should seek board certification because it…

- Recognizes those who have met the eligibility requirements for board certification.
- Identifies a standard of knowledge essential for developing a comprehensive wound management program.
- Advances cooperation and resource exchange among the various disciplines and organizations involved in the treatment of patients with chronic wounds.
- Encourages continued professional growth and development of individuals and the field of wound management.
- Establishes a code of ethics, responsibility and high professional standards by all certified individuals.

ABWM Board Certification by Examination

The ABWM shall grant Associate status to those individuals who successfully pass the National Board Certification Examination for Wound Management Professionals or Associates. Such Associates shall be referred to as "Certified Wound Care Associate® of the ABWM," and shall be entitled to use the designation CWCA® after their name.

The ABWM shall grant Diplomate status to those individuals who successfully pass the National Board Certification Examination for Wound Management Professionals. Such Diplomates shall be referred to as "Certified Wound Specialists® of the ABWM" and shall be entitled to use the designation CWS® after their name.

The ABWM shall grant Diplomate status to those individuals who successfully pass the National Board Certification Examination for Certified Wound Specialist Physicians. Such Physicians shall be referred to as "Certified Wound Specialists Physicians® of the ABWM" and shall be entitled to use the designation CWSP® after their name.

Eligibility for Board Certification

Any healthcare professional with at least three years of experience in wound care is eligible to take one of our examinations.

- If you have at least a high school diploma or equivalent, you are eligible to apply for the CWCA exam.
- If you have at least a Bachelor's degree, and you have a valid, clinical license, you are eligible to apply for the CWS exam.

- MDs, DOs, and DPMs are eligible to apply for the CWSP exam.

http://www.aawm.org/

- ABWM Certified
- CWS
- FAQs

Frequently Asked Questions

View our list of common questions and their answers by clicking on the individual arrow buttons to expand or expand all.

Expand all
Collapse all

Questions and Answers for CWCA, CWS and CWSP

Who is eligible to take our National Board Certification Examinations?
Where are the examinations offered?
How much is the first-time exam fee? How much is the re-test fee?
How will I know the exact location and time of the exam site?
How long is the exam and how is it structured?
May I have my score verified?
Where can I find review textbooks, courses or seminars to prepare for my exam?
Can individuals outside of the United States sit for the Board Certification Examinations?
When do I receive my exam scores?
What is the pass rate for the each of the exams?
How are the exams developed?

The examination is based on a job analysis study (also known as a role delineation study) that is conducted periodically to determine the job content elements that are related to effective job performance. They survey tool used in the job analysis study is developed by a panel of subject matter experts. The survey is distributed to a large number of wound care professionals to gather data representative of the field of practice. The results of the job analysis study are used to develop the content outline for each examination. All versions of the exams correspond to the requirements of the content outline.

An interdisciplinary team of CWS's, CWCA's and CWSP's who are supervised by the ABWM Examination Chair and Applied Measurement Professionals, Inc. (AMP), constructs the items included in the examination. The Examination Committee meets two to three times a year to review the items and the examination itself for validation. All examination materials are under the control of AMP, and Examination Committee members do not have copies or notes from these committee meetings. AMP also runs statistical analysis on each examination and examination items to validate their effectiveness as examination questions.

ABWM oversees a continual process of job analysis studies, content outline development, question writing and review, and analysis and evaluation of the exam to ensure that the content of each exam remains up-to-date and accurate.

How is the passing point determined?

Do I receive a certificate and ID card after passing the examination?

What initials may I place after my name, and when am I allowed to do so?

How is this certification useful to me as a healthcare professional?

When do I renew?

Renewals are due by the end of January of each year. The renewal fee is $150.00 annually. You can complete the annual renewal process by accessing the My Certification Portal.

How many Continuing Education Units (CEUs) do I need each year to remain certified?

A minimum of six (6) hours of CEUs in the field of wound managment are required each year to stay certified. This information should documented in the My Certification Portal prior to the annual renewal deadline. Your CEUs must be completed between the date of your last renewal payment and the date of your current renewal deadline.

When do I recertify?

Each CWCA, CWS, and CWSP is required to recertify 10 years after their initial certification date. The recertification process entails sitting for the appropriate exam, administered some time before your 10-year anniversary. Detailed instructions and application materials will be sent before your certification expires. View the Recertification Application.

What are the renewal and recertification policies?

I have recently changed addresses, but am not sure which address you have. Can I change this information online, or should I contact the ABWM?

My certification has lapsed without my knowledge, and I have received a letter stating that I have been revoked. Why wasn't I notified by e-mail or phone? And, is there anything I can do to keep my certification, and do I have to retake the Board Certification Exam?

I have some questions I would like to submit to be considered for use in future examinations. How would I go about sending these in?

Do you have a list of CWCAs, CWSs and CWSPs in my city or my state?

Can the ABWM answer questions about a specific course of treatment or wound care product?

What are the bylaws and governance structure of ABWM?

What are the appeals and disciplinary procedures for ABWM?

ABWM Name Change

How will this impact the annual renewal process?
Will the new name affect my CWS, CWCA or CWSP certification?
How soon will I receive my new certificate, identification card and certification patches?
Can I still use my old certificate, identification card, and other materials with the American Academy of Wound Management name?
How was the new logo and branding process decided on?

ABWH

User ID Password Log in
Register Now Forgot Password Remember Me

Please see Certified Hyperbaric and Wound Specialist, Page 2.

Home

Examinations

Physician Certification in Hyperbaric Medicine
Physician Certification in Wound Care
X Certified Hyperbaric and Wound Specialist (CHWS)

Physician Certification in Hyperbaric Medicine

Fee: $1,200 ($1,450 during late registration)
Exam format: 160 questions
Certification duration: 10 years
This exam is available to all MD & DO physicians. All candidates must:

- Have an active valid US physician medical license
- Have attained a primary board certification in an ABMS approved specialty
- Provide verification of supervision of a minimum of 300 hyperbaric patient treatments within the prior 2 years
- Have attended a primary training program approved by either the American College of Hyperbaric Medicine, the Undersea and Hyperbaric Medical Society, the US Department of Defense, or completed an approved hyperbaric fellowship
- Provide a letter of Verification from program Medical Director or hospital administrator documenting good standing and active status of professional credentialing
- Have an active membership in good standing with the ACHM

Recertification: After the initial certification period of 10 years, clinicians wishing to maintain active status of their certification in clinical hyperbaric medicine must take the recertification exam as well as confirm continued active practice in hyperbaric medicine. Recertification candidates must submit verification of supervision of a minimum of 100 hyperbaric patient treatments during the period of the prior 12 months. Successful completion of the recertification process will provide a 10 year renewal of the certificate of added qualification.

Exam Preparation: To prepare for the exam, you are encouraged to study "HYPERBARIC MEDICINE PRACTICE" **2nd and 3rd Editions** by Eric P. Kindwall MD and Harry T. Whelan MD.

What is the difference between ABMS Board Certification vs ABWH Certification?

The ABWH does not administer a "board exam", as relevant legal opinion and case law indicates that the terms "Board Examination" and "Board Certified" can be used ethically only by one of the 28 boards recognized by the American Board of Medical Specialties (ABMS). While the ABWH anticipates eventual recognition by the ABMS, until this recognition occurs the ABWH can only confer on the successful applicant a Certificate of Added Qualification and Specialty Certification in the field of Clinical Hyperbaric and Diving Medicine.

For physicians who do not qualify for the ABPM or ABEM Hyperbaric Board Exam, the ABWH examination process is an excellent and recommended pathway for certification. The prerequisites for sitting for the ABWH Physician Certification in Hyperbaric Medicine are nearly identical to the prerequisites now demanded by the ABPM and the ABEM during the "grandfathered" practice track period. Applicants must be an ethical hyperbaric practitioner and a member of the ACHM, provide documentation of several criteria including completion of a 40-hour course in Clinical Hyperbaric Medicine approved as a core curriculum by the American College of Hyperbaric Medicine, the US Department of Defense, or the Undersea and Hyperbaric Medical Society, or have completed a one year approved fellowship in Clinical Hyperbaric Medicine. He or she must also submit documentation of supervision of at least 300 hyperbaric treatments.

The ABWH Physician Certification in Hyperbaric Medicine will require and attest to the same basic skills and knowledge now required by the ABPM and the ABEM. It will recognize and certify hyperbaric competence for mid-career physicians who cannot divorce themselves of their practices for a full year's hyperbaric fellowship or for those physicians who do not meet the criteria to sit for the ABPM/ABEM. It will continue provide a pathway for certification once the ABPM/ABEM closes the practice track. It will provide nationally recognized credible evidence of competence to credentials committees, UHMS Hyperbaric Accreditation Survey Teams, and the Joint Commission on Hospital Accreditation.

The ABWH Physician Certification in Hyperbaric Medicine is endorsed by the American College of Hyperbaric Medicine. Successful completion

ALL-STATE LEGAL® Attachment 214 3

Physician Certification in Wound Care

Fee: $1000 ($1,200 during late registration)
Exam format: 165 questions
Certification duration: 7 years
This exam is available to all physicians (MD, DO, DPM). The physician must:

- Have a current State Medical License
- Provide verification of a minimum of two years clinical experience in wound care
- Provide verification of completion of at least 20 hours of wound care based continuing medical education credit
- Provide documentation of membership in a professional wound care society (Optional- Members of the APWCA can qualify for fellow status)

The exam will focus on the principles involved in the diagnosis, assessment, and management of complex acute and chronic wounds.
Subject Matter Domains:

- Diagnosis and Management of Diabetic Ulcers, Venous and Arterial Insufficiency Ulcers, Pressure Ulcers, Surgical and Traumatic Wounds, and Atypical Wounds
- Physiology of Wound Healing
- The Diagnosis and Management of Wound Infection
- Appropriate Utilization of Advanced Modalities
- Medical-Legal Aspects of Wound Care, Documentation

Recertification: After the initial certification period of 7 years, clinicians wishing to maintain active status of their certification in wound care must take the recertification exam as well as confirm continued active practice in the field of wound care. Recertification candidates must submit verification of continued active wound care practice during the period of the prior 12 months. Successful completion of the recertification process will provide a 7 year renewal of the certificate of added qualification.
Exam Preparation: To prepare for the exam, you are encouraged to study:

- "WOUND CARE ESSENTIALS – Practice Principles" 3rd Edition. Sharon Baranoski, MSN, RN and Elizabeth A. Ayello, PhD, RN.
- "WOUND CARE PRACTICE" 2nd Edition. Sheffield PJ, Fife CE, eds.. Flagstaff, AZ, Best Publishing, 2007.

The Benefit of ABWH Physician Certification in Wound Care versus other exams:
The ABWH Physician Certification in Wound Care is the only certification process endorsed by several professional societies. The American Professional Wound Care Association (APWCA) only endorses the ABWH exam. Successful completion of the ABWH examination process by members of the APWCA allows the special recognition and distinction as Fellows of the APWCA, or use of the designation FAPWCA. The APWCA is the largest professional wound care society with an active membership of nearly 3,000 which includes more physicians and podiatrists than any other professional society. Additionally, The American College of Hyperbaric Medicine recognizes and endorses the ABWH as providing the exam for physician certification in wound care. The exam was written and validated by physicians, and created in response to requests from hospital credentialing committees for a certification process resulting in verification of clinical competency in wound care. Certification in the specialty of wound care is the clinician's professional mark of achievement, and more importantly a seal of quality care for the public and patients. As a physician specific examination, the ABWH believes this exam will serve as the foundation for specialty recognition.

Certified Hyperbaric and Wound Specialist (CHWS)

Fee: $375 ($450 during late registration)
Exam format: 150 questions
Certification duration: 5 years
Prior to applying for certification the candidate must have met the following requirements:

- A minimum of two years of experience in a hospital setting or outpatient facility as a Hyperbaric Technician with cross training as a Wound Care Assistant or equivalent clinical position
- A minimum of 500 hours of clinical experience per year for the prior 2 years, with time shared between hyperbaric chamber operations and actual participation in wound related patient care and management (at least 25% of time must be dedicated to wound care)
- Completion of a 40-hour introductory hyperbaric medicine course or 40-hour primary training program approved by either the American College of Hyperbaric Medicine, the Undersea and Hyperbaric Medical Society, or the US Department of Defense
- Completion of Core Competencies in Hyperbaric Therapy and Wound Care, verified and endorsed by your employer, Medical Director or Program Manager validating your clinical experience detailed in the Core Competency Checklists

Positions Eligible to Apply for Examination:

- Hyperbaric Technician
- Diver Medical Technician

- Certified Nurse Aide
- EMT Paramedic
- Life Support Technician
- Physician Assistant
- Registered Nurse or LPN
- Nurse Practitioner
- Physician
- Veterinarian
- Podiatrist

The Certified Hyperbaric & Wound Care Specialist (CHWS) examination will confer dual competency as a hyperbaric and a wound care technologist. The following areas are included in the knowledge and skill domains that are evaluated during the certification process:

Hyperbaric:

- Basic Hyperbaric Knowledge
- Chamber Operations, Equipment & Environment
- Safety, Emergency Protocols & Patient Management

Wound Care:

- Basic Wound Knowledge
- Patient Assessment & Care Skills
- Wound Care Procedures
- Wound Care Regulations

Each candidate will be required to have all competency checklists signed (by the Program Manager or Medical Director) to document knowledge and clinical skill competence in the required areas. These checklists must be submitted with the CHWS Application.

The ABWH Certified Hyperbaric & Wound Care Specialist Examination is endorsed by the American College of Hyperbaric Medicine and the American Professional Wound Care Association. Successful completion of the examination process allows the special recognition and distinction as a Certified Hyperbaric & Wound Care Specialist, and use of the designation CHWS.

Introduction to Hyperbaric Medicine and Problem Wound Management

The objective of this course is to promote the advancement of knowledge of hyperbaric oxygen therapy and problem wound management for physicians and allied health professionals based on a thorough understanding of decompression tables, hyperbaric chamber safety, treatment indications for hyperbaric oxygen, normal wound healing, patient assessment techniques, and wound treatment modalities. Complete goals and objectives in advance available upon request.

Physicians

Diversified Clinical Services is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AMA PRA Statement

Diversified Clinical Services designates this educational activity for a maximum of 42.5 *AMA PRA Category 1 Credit(s)™*. Physicians should only claim credit commensurate with the extent of their participation in the activity.

UHMS

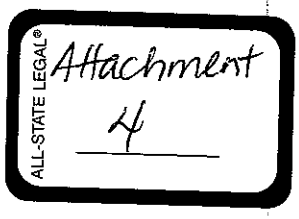
The Undersea and Hyperbaric Medical Society has reviewed and approved this activity as a UHMS Designated Introductory Course in Hyperbaric Medicine. This activity meets the UHMS minimum requirements including 40 hours of face-to-face instruction.

NBDHMT

This activity has been reviewed and approved for 40 hours of Category A credits, by the National Board of Diving and Hyperbaric Medical Technology.

Nurses

Diversified Clinical Services, Inc. is accredited as a provider of continuing nursing education by the State of Florida, Board of Nursing (provider no. FBN 50-531). This Continuing Nursing Education Activity is Provider Approved for 42.5 Contact Hour(s). This course completion will be electronically reported to CE Broker as required per Florida Statute 456.025(7).



Articles of Note

Hyperbaric Nursing

By James R. Wilcox, RN, BSN, ACHRN and Nancy Paez, BSN, RN, ACHRN

Wound Care & Hyperbaric Medicine

Oct - Dec 2011

Hyperbaric Oxygen Therapy: Success Under Pressure

By Connie Goldsmith, RN, MPA, and James R. Wilcox, RN, BSN, ACHRN, CWCN, CFCN, CWS, WCC, DAPWCA, FCCWS

Nurse.com

September 26, 2011

Human Fibroblast-Derived Dermal Substitute: Results from a Treatment Investigational Device Exemption (TIDE) Study in Diabetic Foot Ulcers

By Robert A. Warriner III, MD, FACA, FCCP, FCCWS, ABPM/UHM; Matthew Cardinal, ME; on behalf of the TIDE Investigators

Advances in Skin Care

July 2011

Evidence-Based Nursing

By James R. Wilcox, RN, BSN, CWCN

Wound Care & Hyperbaric Medicine

April – June 2011

Oxygen Toxicity and its Prevention

By James R. Wilcox, RN, BSN, CWCN

Wound Care & Hyperbaric Medicine

January – March 2011

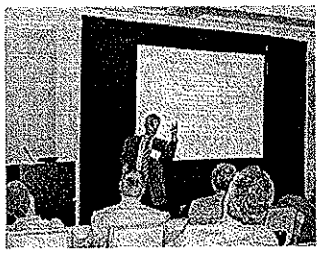
SAWC Fall Speakers Include Several DCS Wound Experts

(Clockwise from left): Gregory Bohn, MD, Deborah Stewart, MD, James Wilcox, RN, Peter Norris (HMP Communications), and Linda Montoya, RN.

The Symposium on Advanced Wound Care (SAWC), held in Las Vegas last October, featured 40 new clinical sessions, numerous exhibitions and a host of speakers from the front lines of the field of wound care, including four DCS wound experts: James Wilcox, RN, spoke of "The Art and the Evidence of Compression Therapy;" Deborah Stewart, MD, addressed "How to Diagnose and Treat Osteomyelitis;" and Gregory Bohn, MD, and Linda Montoya, RN, presented on "How to Use NPWT."

DCS Holds Second CME-Accredited Physician Symposium

DCS' West Coast physician symposium, held the first weekend in October, was the second such gathering hosted by DCS this year. In addition to providing instruction, the CME-accredited event included a panel discussion on Medicare and quality of care, tips for effectively managing practices, and an interactive discussion that answered questions posed by attendees. The Ritz Carlton in Laguna Niguel, CA, provided an inspiring setting for the lively, informative discussions that took place that weekend.



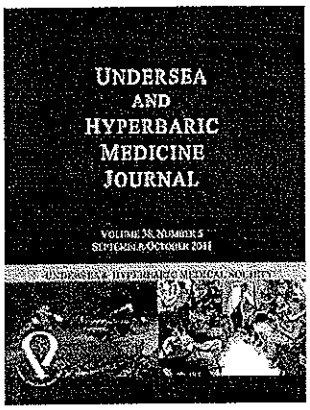
David Cifu, MD, discusses the controversies of using HBOT for concussive syndrome.

Deborah Stewart, MD, and DCS CEO, Jeff Nelson, dined with symposium attendees at the Ritz Carlton, Laguna Niguel.

Brookhaven Memorial Hospital's Center for Wound Care and Hyperbaric Medicine at National Clinical Symposium on Advances in Skin and Wound Care

Brookhaven Memorial Hospital's Center for Wound Care and Hyperbaric Medicine was well-represented at the National Clinical Symposium on Advances in Skin and Wound Care held in National Harbor, Maryland in September.

3 DCS Abstracts Published in UHMS Medicine Journal



Additional Risk of Dialysis in Patients Receiving HBO2 for Limb Salvage

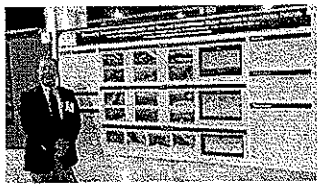
Wilcox JR, Warriner RA, Stewart D, Paez NJ

Critical Importance of Glycemic Control In HBO Patients for Limb Salvage

Wilcox JR, Warriner RA, Stewart D, Paez NJ

Analysis of Adverse Events Occurring in Patients Undergoing Adjunctive HBOT

Beard T, Watson B, Barry R, Stewart D, Warriner RA



Charles R. Dennis, MD, stands in from of Brookhaven's poster at the symposium.

Charles R. Dennis MD, FACS, CWS, FACCWS, Associate Medical Director of the Center®, attended the symposium, while he and Center staff collaborated on the development of a well-received poster on the treatment of Calciphylaxis with Skin and Subcutaneous Tissue Necrosis in Non-Uremic Patients. Dr. Dennis was also asked to deliver a lecture on the topic.

DCS' Richard Barry Honored by UHMS for Lifetime Dedication

(left to right): Coral Barry (daughter of Richard Barry), DCS' Richard Barry, and W. Tom Workman.

During the annual Undersea and Hyperbaric Medical Society (UHMS) Gulf Coast Chapter Meeting last August, Richard Barry, DCS' Vice President of Hyperbaric Services, was presented with the Wilbur T. Workman Safety Award. The award was given to Barry in recognition of the instrumental role he has played in improving and maintaining safety standards in the field of undersea and hyperbaric medicine.

Contact

Deborah Stewart, MD
Executive Vice President
Medical Affairs and Quality
904.482.0812 (direct)

The Blogosphere

AAWC News
Hyperbaric Oxygen Therapy News
Wound Care Education Institute

Call 1-800-373-HEAL (4325) for a Wound Care Center® near you

Notice of Privacy Practices | Privacy Policy | Terms of Use

Courses & Meetings:Other

More in this Section...

Share |

ALL COURSES & MEETINGS: ARE LISTED IN OUR
"COMMUNITY CALENDAR" BY DATE AND ARE SEARCHABLE BY TITLE

The Undersea and Hyperbaric Medical Society is accredited by the ACCME to provide continuing medical education for physicians (MD/DO) but also seek approval through the National Board of Diving and Hyperbaric Medical Technology and Wound Care Education Partners for certification requirements for other allied health professionals. We offer directly sponsored courses that can be found on our calendar as well as joint sponsorship with other non-accredited organizations.

All CME educational activities developed and presented by the UHMS must be developed and presented in compliance with ACCME accreditation requirements-in addition to all the requirements of the AMA PRA program.

The UHMS can sponsor live CME activities or enduring materials CME. In each case, the UHMS Education Committee carefully monitors and evaluates CME activities to ensure that they meet ACCME, AMA, and UHMS requirements. The activity must be relevant to the practices of diving medicine or hyperbaric medicine.

Please contact us if you have any questions.

PLEASE CLICK ON THE TYPE OF COURSE BELOW TO SEE THE LISTING

- DIRECTLY SPONSORED COURSES The UHMS is authorized to directly sponsor CME that are solely UHMS activities (e.g., annual scientific meetings, workshops, and courses). In order to maintain national accreditation to sponsor CME, the UHMS must comply with the ACCME three Essential Areas and their Elements.

- DIRECTLY SPONSORED MEETINGS The UHMS is authorized to directly sponsor CME that are solely UHMS activities (e.g., annual scientific meetings, workshops, and courses). In order to maintain national accreditation to sponsor CME, the UHMS must comply with the ACCME three Essential Areas and their Elements.

- INTRODUCTORY COURSES The UHMS is authorized to jointly sponsor Introductory Course CME with non-accredited entities. An organization that is not accredited by the ACCME to provide continuing medical education for physicians may apply to the UHMS for Introductory Course joint sponsorship. The CME activity must comply with the ACCME three Essential Areas and their Elements. UHMS Education Committee involvement in planning the CME activity must be thoroughly documented. An Education Committee review must occur before CME can be sponsored by the UHMS. UHMS will issue CME Certificates to physician participants showing the number of AMA PRA Category 1 Credits™ earned. The Joint Sponsor of the Introductory Course is a CME Unit that must maintain independence of commercial influence in all its CME activities. To be in compliance with ACCME Standards for Commercial Support, the UHMS will not review CME Activity Applications from medical product manufacturers. An organization is not eligible to apply for joint sponsorship of an Introductory Course if, in the opinion of the UHMS, its activity is devoted to advocacy of unscientific modalities.

  THE FOLLOWING ARE A LISTING OF APPROVED UHMS INTRODUCTORY COURSES:

  HYPERBARIC MEDICINE TEAM TRAINING
  International ATMO – San Antonio, Texas
  Paul Sheffield, Director
  Credits: 42 hours AMA PRA Category 1 Credits™ / physicians
  40.5 contact hours – Texas Nurses Association
  Contact: education@hyperbaricmedicine.com / +210-614-3688
  www.hyperbaricmedicine.com

  INTRODUCTORY COURSE IN HYPERBARIC MEDICINE
  Wound Care Education Partners – Travels on-site
  John S. Peters, Director 5-8; Atlanta, GA
  Credits: 40 *AMA PRA Category 1 Credits™* / physicians
  40 contact hours by the Florida Board of Nursing
  40 Category A credit hours credit hours by the NBDHMT
  Contact: *jpeters@woundeducationpartners.com* / +561-271-3276
  www.woundeducationpartners.com/

  PRIMARY TRAINING IN HYPERBARIC MEDICINE
  National Baromedical Services, Inc. – Columbia, South Carolina
  Dick Clarke, Director
  Credits: 40 hours *AMA PRA* Category 1 Credits™ / physicians
  40 hours Category A Credits / NBDHMT
  40.8 contact hours – RNs
  40 CRCE hours – RTs
  Contact: *registration@baromedical.com* / +803-434-7101
  www.baromedical.com

  INTRODUCTION TO HYPERBARIC MEDICINE AND WOUND CARE
  Long Beach Memorial Center – Long Beach, California

Attachment 220
ALL-STATE LEGAL®

Stuart Miller, Director
Credits: 40 *AMA PRA Category 1 Credits™* / physicians
Contact: *SMiller1@memorialcare.org* / +562-933-6950
www.longbeachhyperbaricmedicine.com

INTRODUCTION TO HYPERBARIC MEDICINE
Life Support Technologies – *Glenn Butler, Director*
Credits: 42 *AMA PRA Category 1 Credits™* / physicians
Contact: *Info@lifesupport-USA.com* / +914-333-8412
www.LifeSupport-USA.com

PRIMARY HYPERBARIC MEDICINE COURSE
International ATMO – at King Faisal Hospital, Riyadh, Saudi Arabia
Paul Sheffield, Director
Credits: 40.5 *AMA PRA Category 1 CreditsTM*
Contact : *education@hyperbaricmedicine.com* / +210-614-3688
www.hyperbaricmedicine.com

HYPERBARIC INTRODUCTORY COURSE
Hyperbaric Medicine Department LDS Hospital
Salt Lake City, Utah – *Lindell Weaver, Director*
Credits: 41.5 hours *AMA PRA Category 1 Credits™* / physicians
Contact: *jan.mcintosh@imail.org* / +801-507-5370

INTRODUCTION TO HYPERBARIC MEDICINE AND WOUND CARE CHALLENGES
Serena Group, Inc. – *Jack Marnoni, Director*
Credits: 41.5 hours *AMA PRA Category 1 Credits™* / physicians
Contact: *jmarnoni@serenagroups.com* / +814-688-2002

INTRODUCTION TO HYPERBARIC MEDICINE AND WOUND CARE
Paradigm Medical Management – Gardena, California
Credits: 40 hours *AMA PRA* Category 1 Credits™ / physicians

INTRODUCTION TO HYPERBARIC MEDICINE FOR PHYSICIANS
DDRC Pro Services Training
Credits: 40 hours *AMA PRA Category 1 Credits™* / physicians
Where: Diving Diseases Research Centre Derriford, Plymouth, UK
Contact: *training@ddrc.org*
www.ddrc.org

INTRODUCTION TO HYPERBARIC MEDICINE & PROBLEM WOUND MANAGEMENT
*This course is Co-Sponsored- meaning UHMS does not provide CME credits but rather approve it as meeting the standards of an approved UHMS Introductory Training Course
Healogics
Credits: 45 hours *AMA PRA Category 1 Credits™* / physicians
Where: Jacksonville, Florida, USA
Contact: teresa.rooney@healogics.com/ 904-446-3527
www.healogics.com

INTRODUCTORY HYPERBARIC TRAINING
*This course is Co-Sponsored- meaning UHMS does not provide CME credits but rather approve it as meeting the standards of an approved UHMS Introductory Training Course
Posoidon International
Credits: 41 hours AMA PRA Category 1 Credits™ / physicians
Where: St. Luke's Medical Center, Milwaukee, WI, USA
Contact: kevan.corson@gmail.com / (512) 924 4266

- JOINTLY SPONSORED COURSES The UHMS is authorized to jointly sponsor CME with non-accredited entities. An organizationthat is not accredited by the ACCME to provide continuing medical education for physicians may apply to the UHMS for joint sponsorship. The CME activity must comply with the ACCME three Essential Areas and their Elements. UHMS Education Committee involvement in planning the CME activity must be thoroughly documented. An Education Committee review must occur before CME can be sponsored by the UHMS. UHMS will issue CME Certificates to physician participants showing the number of AMA PRA Category 1 Credits™ earned. The Joint Sponsor is a CME Unit that must maintain independence of commercial influence in all its CME activities. To be in compliance with ACCME Standards for Commercial Support, the UHMS will not review CME Activity Applications from medical product manufacturers.An organization is not eligible to apply for joint sponsorship if, in the opinion of the UHMS, its activity is devoted to advocacy of unscientific modalities.

ADVANCED DIVING AND HYPERBARIC MEDICAL TEAM TRAINING PROGRAM WITH CHAMBER OPERATION Hyperbarics International – Key Largo, Florida
Dick Rutkowski, Director
Credits: 40 *AMA PRA Category 1 Credits™* / physicians
40 CEUs for all allied medical personnel (EMT, CHT)
This course is approved for NBDHMT for CHT and CHRN personnel
Contact: dick@hyperbaricsinternational.com/ 888-451-2551
www.hyperbaricsinternational.com

WOUND CARE COURSE
International ATMO – San Antonio, Texas
Paul Sheffield, Director
Credits: 12 hours *AMA PRA Category 1 Credits™*/ physicians
12.4 contact hours/ Texas Nurses Association
Contact: *education@hyperbaricmedicine.com* /+210-614-3688
www.hyperbaricmedicine.com

HYPERBARIC SAFETY DIRECTOR TRAINING COURSE
International ATMO – San Antonio, Texas
Paul Sheffield, Director
Credits: 24 hours *AMA PRA Category 1 Credits™* / physicians
22.75 contact hours / Texas Nurses Association
24 Category A credit hours credit hours / NBDHMT

Contact: education@hyperbaricmedicine.com/ +210-614-3688
www.hyperbaricmedicine.com

INSPECTION, MAINTENANCE AND DOCUMENTATION OF HYPERBARIC CHAMBER ACRYLICS
International ATMO – San Antonio, Texas
Paul Sheffield, Director

Credits: 8 hours *AMA PRA Category 1 Credits™* / physicians
Contact: education@hyperbaricmedicine.com / +210-614-3688
www.hyperbaricmedicine.com

MEDICAL ASSESSMENT FOR FITNESS TO DIVE
Diving and Hyperbaric Medical Educators, L.L.C. – New Orleans
John Wassel, Director
Credits: 36 *AMA PRA Category 1 Credits™* / physicians
Contact: Don Chandler (donaldchandler@comcast.net) /+ 443-955-9165 / + 504-836-8000
www.divingfitness.com

MEDICINE OF DIVING
International ATMO – Bonaire, Dutch Caribbean
Paul Sheffield, Director
Credits: 23 hours *AMA PRA* Category 1 Credits™ / physicians
Contact: education@hyperbaricmedicine.com / +210-614-3688
www.hyperbaricmedicine.com

ADVANCED HYPERBARIC SYMPOSIUM
National Baromedical Services, Inc. – Columbia, South Carolina
Credits: 20 hours *AMA PRA Category 1 Credits™* / physicians
Contact: registration@baromedical.com / +803-434-7101
www.baromedical.com

BIOFILM: A MICRO-REVOLUTION
Southwest Regional Wound Care Center – Lubbock, Texas
Credits: 1 hour *AMA PRA Category 1 Credit™* / physicians
Contact: Lisa Morrow lisa@randallwolcott.com / +806-793-8869

DIVE AWAY
Long Beach Memorial Medical Center – Long Beach, Calif.
Credits: 24 hours *AMA PRA Category 1 Credits™* / physicians
Contact: Jeff Bozanic JBozanic@HQonline.net / +562-933-6950
http://www.longbeachhyperbaricmedicine.com/dive_away_diving_medicine_course.html

WOUND CARE CERTIFICATION REVIEW
Peters Education Group, LLC *d/b/a* Wound Care Education Partners
Credits: 8.5 *AMA PRA Category 1 Credits™*
Contact: jpeters@woundeducationpartners.com / +561-271-3276
www.woundeducationpartners.com

UPSTATE DIVING AND HYPERBARIC MEDICINE SYMPOSIUM
SUNY Upstate Medical University -Syracuse, NY
Credits. 8.25 AMA PRA Category 1 CreditsTM
Contact: morer@upstate.edu/ 315-464-4363
http://www.upstate.edu/emergency/

COLUMBIA WOUND CARE CONSORTIUM, QUARTERLY SYMPOSIUM 2013
Columbia Wound Care Consortium- Portland, OR
Credits: 3.5 *AMA PRA Category 1 Credits TM*
Contact: gcameron@columbiawound.org / 503-505-1591
www.columbiawound.org

GREATER ALLEGHENY VALLEY WOUND CARE & HBOT CONFERENCE
SerenaGroup, Inc- Freeport, Pennsylvania
Credits: 5 *AMA PRA Category 1 Credits TM*
Contact: jmarnoni@serenagroups.com / 814-668-2002

CO-SPONSORED COURSES: The UHMS is authorized to co-sponsor CME with other accredited entities. An organization that is already accredited by the ACCME to provide continuing medical education for physicians may apply to the UHMS for co-sponsorship. The CME activity must comply with the ACCME three Essential Areas and their Elements. An Education Committee review must occur even though CME is provided by the other accredited entity. The accredited provider responsible for issuing CME certificates will be determined upon UHMS application approval.

- OTHER EVENTS & MEETINGS: listed for information only

The 61st International Congress of Aviation and Space Medicine (ICASM 2013)
Where: Jerusalem, Israel
When: 6-10 October, 2013
Website: http://www.icasm2013.org

The ICASM 2013 Congress will bring together professionals from the fields of Aero Dentistry, Aerospace, Aerospace Medicine, Aviation and Environmental Physiology, Aviation Psychology, Civil Aviation, Ergonomics, Human Physiology, Hyperbaric Medicine, Intensive Care, Military Medicine, Nutrition, Occupational Medicine, Pharmacology and more.

State of Wisconsin
Department of Safety & Professional Services

AGENDA REQUEST FORM

1) Name and Title of Person Submitting the Request:	2) Date When Request Submitted:
Karen Rude-Evans, Bureau Assistant, On Behalf of Executive Director Tom Ryan	October 2, 2013 Items will be considered late if submitted after 4:30 p.m. on the deadline date: ▪ 8 business days before the meeting for paperless boards ▪ 14 business days before the meeting for all others

3) Name of Board, Committee, Council, Sections:

Podiatry Affiliated Credentialing Board

4) Meeting Date:	5) Attachments:	6) How should the item be titled on the agenda page?
October 24, 2013	☒ Yes ☐ No	Article by Carl Ameringer, PhD, JD, State Medical Boards and the Problem of Unnecessary Care and Treatment

7) Place Item in:	8) Is an appearance before the Board being scheduled?	9) Name of Case Advisor(s), if required:
☒ Open Session ☐ Closed Session ☐ Both	☐ Yes (Fill out Board Appearance Request) ☒ No	

10) Describe the issue and action that should be addressed:

Board discussion.

11) Authorization

Karen Rude-Evans

Signature of person making this request — Date

Supervisor (if required) — Date

Executive Director signature (indicates approval to add post agenda deadline item to agenda) — Date

Directions for including supporting documents:
1. This form should be attached to any documents submitted to the agenda.
2. Post Agenda Deadline items must be authorized by a Supervisor and the Policy Development Executive Director.
3. If necessary, Provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.

State Medical Boards and the Problem of Unnecessary Care and Treatment

Carl F. Ameringer, PhD, JD

ABSTRACT: The overutilization of medical tests and procedures has been identified as an important reason for the high costs of health care in America. Because the problem of overutilization is so multifaceted and complex, detection has been uneven and deterrence has been erratic. Recognizing the increasing severity of the problem and the adverse effect that overutilization may have on patient safety and care, the medical profession in recent years has increased its efforts to curtail excess treatment. Several national specialty societies, for example, have identified certain tests and procedures that may be unnecessary or overused, and they have disseminated their findings to physicians and patients. The question that this article seeks to address is what role state medical boards should have in reducing unnecessary care and treatment. This article argues that state medical boards, congruent with their mission of public protection, should enhance their oversight, detection, and regulation in this area. Professional ethics and specialty society guidelines could provide the basis for disciplining persistent and egregious offenders.

Sounding an alarm, the Institute of Medicine (IOM) in a September 2012 report called upon the health care community to reduce wasteful and unnecessary spending on health care services.[1] The cause for concern was an estimated $750 billion loss in 2009, or about 30% of that year's total spending. Pointing to the complexity of the nation's health care system, the IOM contended that the responsibility for addressing the problem "rest[ed] on many shoulders," and that a concerted effort involving payers of health care, individual and institutional providers, consumers, and regulators was needed. Among those that the IOM singled out for assistance were state licensing boards.

The IOM's inclusion of state licensing boards was unusual. Recent efforts to reduce waste and duplication have focused on system-building—organizational integration, data infrastructure, workforce collaboration, and patient-centered care. While these largely systemic approaches to health care delivery should reduce wasteful spending, such measures do not directly address individual accountability for overutilization. Because the health care industry is so labor intensive and because patient care is often episodic and idiosyncratic, the cumulative decisions of physicians can influence the total cost of health care delivery substantially. Doctors, in other words, are important to containing costs in America.

For at least two reasons, state medical boards should embrace the IOM's challenge and join with other groups and organizations that seek to reduce wasteful spending. First, as noted, about 30% of all health care costs in the United States can be attributed to wasteful spending, much of it on outpatient medical services, a cost component that can be tied closely to physicians' treatment decisions. Second, the overutilization of diagnostic tests and surgical procedures increases the risk of infections, diseases, complications, and poor patient outcomes. This is a matter of public protection.

THE CUMULATIVE DECISIONS OF PHYSICIANS CAN INFLUENCE THE TOTAL COST OF HEALTH CARE DELIVERY SUBSTANTIALLY.

Though state licensing boards can discipline physicians for unprofessional conduct, only thirteen boards have an explicit disciplinary provision in their medical practice acts or statutes that pertains to unnecessary care and treatment. These states are Alabama, Arkansas, California, Colorado, Florida, Kansas, Maryland, Missouri, New Mexico, New York, North Dakota, Vermont, and Wyoming (Table 1). Yet, boards in these states infrequently apply such provisions to offending physicians. Of those that publish their results online, only California, Florida, Missouri, and Vermont regularly appear to discipline licensees for overutilization.[2]

There are practical reasons for state boards' reluctance. These include difficulties in determining precisely what unnecessary care and treatment entails and in establishing or setting parameters for disciplinary action. Unlike most cases which require peer review to determine a breach of the standard

of care, doctors' technical skills may not be at issue. Because unnecessary care and treatment is so widespread, moreover, boards likely will get pushback from physicians who may view such oversight as anticompetitive.

Notwithstanding these and other challenges, boards have a role to play in controlling the overutilization of health care services. Physicians who routinely order unnecessary tests or perform questionable procedures very likely harm their patients. In many such instances, disciplinary action would seem appropriate.

The High Cost of Medical Services in U.S. Outpatient Settings

Of the three main goals of health policy—increasing access to care, controlling costs, and enhancing quality—cost control clearly has emerged as *the* significant challenge of the twenty-first century.[3] The spending gap between the United States and all other countries for which the Organization for Economic Co-operation and Development (OECD) collects data is quite large and is growing. Accounting for inflation and purchasing power parity, total per capita health expenditures in the United States averaged $356 in 1970, $1,102 in 1980, $2,851 in 1990, $5,993 in 2003, and $8,233 in 2010, almost double the amounts in recent years for the next closest spending nations.[4]

THE OVERUTILIZATION OF DIAGNOSTIC TESTS AND SURGICAL PROCEDURES INCREASES THE RISK OF INFECTIONS, DISEASES, COMPLICATIONS, AND POOR PATIENT OUTCOMES. THIS IS A MATTER OF PUBLIC PROTECTION.

Close examination of available OECD data for certain countries for the years 2003–2010 reveals that the United States exceeds spending levels in several provider categories, especially for outpatient medical services (Table 2). While the

Table 1
State Medical Boards with a Specific Disciplinary Provision for Unnecessary Care and Treatment

State Medical Board	Applicable Disciplinary Action
Alabama	Performance of unnecessary diagnostic tests or medical or surgical services
Arkansas	Persistent, flagrant over-charging or over-treating of patients
California	Repeated acts of clearly excessive...use of diagnostic procedures...use of diagnostic or treatment facilities
Colorado	Willful and repeated ordering or performance, without clinical justification, of demonstrably unnecessary laboratory tests or studies; the administration, without clinical justification, of treatment which is demonstrably unnecessary
Florida	Performing or attempting to perform...an unauthorized procedure or a procedure that is medically unnecessary or otherwise unrelated to the patient's diagnosis or medical condition
Kansas	Performing unnecessary tests, examinations or services which have no legitimate medical purpose; charging an excessive fee for services rendered
Maryland	Grossly overutilizing health care services
Missouri	Willfully and continually overcharging or overtreating patients; willfully and continually performing inappropriate or unnecessary treatment, diagnostic tests or medical or surgical services
New Mexico	Excessive treatment of patients
New York	Ordering of excessive tests, treatment, or use of treatment facilities not warranted by the condition of the patient
North Dakota	A continued pattern of inappropriate care as a physician, including unnecessary surgery
Vermont	Consistent improper utilization of services; consistent use of nonaccepted procedures which have a consistent detrimental effect upon patients
Wyoming	Willful and consistent utilization of medical services or treatment which is inappropriate or unnecessary

Source: Ala. Code sec. 34-24-360 (11),(12); Ark. Code sec. 17-95-409(a)(2)(O); Cal. Code sec. 725-733(a); Colo. Code sec. 12-36-117(1)(bb)(I); Del. Code sec. 1731(b)(18); Fla. Stat. sec. 456.072(1)(bb); Ill. Medical Practice Act of 1987, 225 ILCS 60/22(A)(25); Kan. Stat. sec. 65-2836(aa); Md. Medical Practice Act HO, sec. 14-404(a)(18); Mo. Rev. Stats. 334.100(4)(a),(c); New Mex. Code sec. 16.10.8.8(E); New York Art. 131-A sec. 6530(35); N. Dak. Medical Practice Act sec. 43-17-31.21; Vermont Stats. chap. 23, sec. 1354(a)(16),(18),(19); Wy. Stats. 33-26-402(a)(xviii).

mean expenditure ratios for inpatient vs. outpatient care are 53:47 for Australia, 64:36 for France, 55:45 for Germany, and 50:50 for Japan, they are almost the reverse for the United States and Canada—30:70 and 39:61 respectively (Table 2). Yet, the United States spent $759 more on inpatient services and $3,018 more on outpatient services for each person on average than did Canada for the years indicated (Table 2).

What explains the huge gap between the United States and other countries in per capita spending for outpatient medical services? Opinions vary. They range from greater access to the latest technology in the United States to the higher incidence of chronic diseases, from overreliance on specialists for primary care to greater costs and overhead, and from enhanced exposure to lawsuits for medical malpractice to fee-for-service payment practices and intense market competition.[5] Combined, these factors significantly have influenced the practice of medicine in America.

Some recent studies have attempted to identify more precisely the distinguishing features or components of greater U.S. spending. According to a 2007 Congressional Research Service report, "intensity of service delivery," by which the report's authors mean "the amount of services used in a given health care encounter," is a distinguishing feature.[6] It is not the number of doctor-patient encounters that explains why the United States

Table 2
Per Capita Inpatient and Outpatient Medical Expenditures for Selected Countries, 2003–2010

	Year/s	Australia	Canada	France	Germany	Japan	United States
Inpatient Medical Expenditures *Measured in U.S. dollars, adjusted for purchasing power parity*	2003	919	523	902	832	699	1,171
	2004	980	536	930	864	722	1,231
	2005	1,031	557	980	912	759	1,294
	2006	1,100	586	1,027	970	791	1,355
	2007	1,176	603	1,073	993	838	1,408
	2008	1,209	626	1,124	1,051	885	1,441
	2009	1,289	686	1,175	1,127	927	1,486
	2010	—	711	1,191	1,171	—	1,519
Outpatient Medical Expenditures *Measured in U.S. dollars, adjusted for purchasing power parity*	2003	831	744	536	698	661	2,607
	2004	908	789	551	728	713	2,789
	2005	940	850	573	730	757	2,962
	2006	987	910	608	782	788	3,116
	2007	1,051	960	631	822	835	3,282
	2008	1,038	1,015	602	880	893	3,456
	2009	1,139	1,094	622	934	889	3,613
	2010	—	1,131	626	961	—	3,740
IP:OP*	2003–2010	53:47	39:61	64:36	55:45	50:50	30:70
IP Difference (US vs. Country)*	2003–2010	262	759	313	373	560	—
OP Difference (US vs. Country)*	2003–2010	2,473	3,018	2,915	2,752	2,965	—

Source: Organization for Economic Cooperation and Development. Health data 2011. U.S. dollars adjusted for purchasing power parity.

Definitions: Expenditure on in-patient care includes all expenditures on curative, rehabilitative, and long-term nursing care for in-patients. An in-patient is a patient who is formally admitted (or "hospitalized") to an institution for treatment and/or care and stays for a minimum of one night in the hospital or other institution providing in-patient care. Expenditure on out-patient care comprises medical and paramedical services delivered to out-patients. An out-patient is not formally admitted to the facility (physician's private office, hospital out-patient center or ambulatory-care center) and does not stay overnight. An out-patient is thus a person who goes to a health care facility for a consultation/treatment, and who leaves the facility within several hours of the start of the consultation without being "admitted" to the facility as a patient.

*All calculations are based on the mean for the given years.

spends more. Rather, it is the greater number of services provided—tests run and procedures performed—per encounter, combined with higher than average unit prices for these services. "The United States uses more of the newest technologies and performs several invasive procedures (such as coronary bypasses and angioplasties) more frequently than the average OECD country," the report's authors said.

BECAUSE UNNECESSARY CARE AND TREATMENT IS SO WIDESPREAD...BOARDS LIKELY WILL GET PUSHBACK FROM PHYSICIANS WHO MAY VIEW SUCH OVERSIGHT AS ANTICOMPETITIVE.

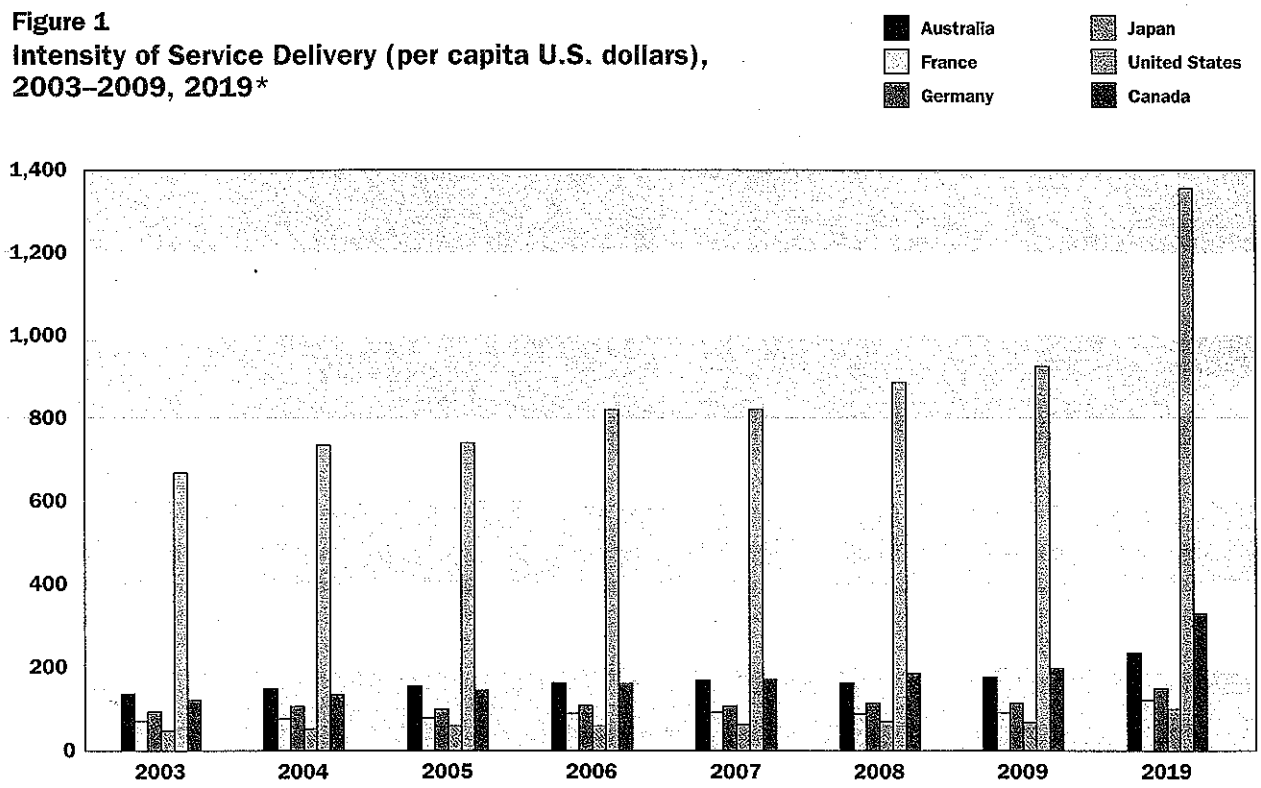
One way to measure the intensity of service delivery is to divide per capita expenditures by the number of times on average that patients see their doctors. Notwithstanding higher per capita costs in the United States, average annual physician consultations are significantly lower.[7] This translates to a much higher level of services per physician-patient encounter. Figure 1 displays the large difference between the United States and other nations as measured by service intensity.

The Threat to Patient Health and Safety

As the above findings demonstrate, U.S. doctors more frequently employ expensive tests and procedures to treat their patients than doctors in foreign countries. Does this mean that many U.S. doctors are over-treating their patients or that a substantial number are conducting unnecessary tests and procedures on them? "Yes," say many analysts and observers.[8]

Leading health policy analysts Donald Berwick and Glenn Hackbarth estimate that between $158 billion and $226 billion of wasteful spending occurs each year because of overtreatment.[9] Overtreatment, they say "comes from subjecting patients to care that, according to sound science and the patients' own preferences, cannot possibly help them—care rooted in outmoded habits, supply-driven behaviors, and ignoring science." Researchers Christine Cassel and James Guest agree with the assessment of Berwick and Hackbarth.

Figure 1
Intensity of Service Delivery (per capita U.S. dollars), 2003–2009, 2019*



Source: Organization for Economic Cooperation and Development. Health data 2011. US dollars adjusted for purchasing power parity.

Note: Per capita dollars reflect out-patient medical expenditures (see Table 2) divided by physician consultations for a given year. Physician consultations represent the number of contacts with an ambulatory care physician divided by the country population. Telephone contacts are excluded.

*Projections based on calculated rate of increase from 2003–2009.

"The initial focus" in reducing costs, Cassel and Guest assert, "should be on overuse of medical resources, which not only is a leading factor in the level of spending on health care but also places patients at risk."[10]

Why do many doctors in the U.S. engage in wasteful spending practices, including the overutilization of health care services? As already mentioned, there are a number of compounding factors, many unique to America. Among these compounding factors, physicians frequently point to the threat of lawsuits to justify excessive tests and procedures. Fear of being sued is a legitimate concern, to be sure, but it should not obscure efforts to curtail unnecessary tests and procedures that enhance doctors' income at the expense of their patients' welfare.[11]

Though monetary incentives always have existed, the medical profession before the 1970s exerted greater influence over practitioners' economic behavior. For much of the twentieth century, the vast majority of doctors shared similar views, beliefs, and experiences, forging common bonds among them. Most belonged to the American Medical Association and their state and local medical societies; few breached norms of conduct concerning economic and social matters. Professional associations and state medical boards rarely had to take disciplinary action because informal sanctions, loss of referrals or even hospital privileges, were so consequential.[12] Professional norms, values, and ethics, as economist Kenneth Arrow noted in a famous article penned in 1963, checked physicians' desires to profit at the expense of patients and fellow colleagues.[13] "[T]here is a 'collectivity-orientation,' which distinguishes medicine and other professions from business, where self-interest on the part of participants is the accepted norm," Arrow noted.

The commercialization of medical practice in recent years has attenuated these former countermeasures.[14] Efforts of professional associations to reduce competition among physicians came under intense scrutiny in the late 1970s when policymakers, seeking to control rising costs, applied principles of economic theory to the health care industry. Specifically, courts and federal agencies struck down certain provisions in the AMA Code of Ethics as anticompetitive, sending a stern warning to the AMA, state, and local medical societies to curtail their enforcement activities.[15] The rise of the national specialty societies, coupled with the AMA's loss of membership and prestige at the end of the twentieth century, meant that no single organization spoke for physicians on professional matters. A "unified profession has given way to power blocs of specialists" or "fiefdoms," renowned medical historian Rosemary Stevens concluded.[16]

Just as current practitioners face fewer professional constraints than their predecessors, so they encounter greater temptations to violate their ethical responsibilities. A sizeable majority of today's practicing physicians are board-certified specialists with advanced training in areas such as orthopedics, cardiology, or oncology. Recent technological innovations have allowed many specialists to perform surgery in ambulatory facilities that they themselves own or jointly own with others. Those in medium to large group practices often compete with hospitals and other physician groups along service or product lines based on specific diseases (cancer) or organ systems (heart, spine). Ancillary services, frequently of the diagnostic variety (computed tomography [CT] scan and Magnetic Resonance Imaging [MRI]), can supplement doctors' incomes substantially.[17]

PHYSICIANS WHO ROUTINELY ORDER UNNECESSARY TESTS OR PERFORM QUESTIONABLE PROCEDURES VERY LIKELY HARM THEIR PATIENTS. IN MANY SUCH INSTANCES, DISCIPLINARY ACTION WOULD SEEM APPROPRIATE.

Physician ownership of outpatient facilities has contributed significantly to the sharp increase in costs and procedures. Seth Strope and colleagues found, for instance, that "the conversion of [physician] non-owners to [physician] owners" was associated with a 53% rise in urological surgeries in Florida surgical centers for the period 1998 to 2002.[18] Louise Pilote and colleagues, moreover, linked the supply of catheterization laboratories to an increase in heart bypass surgeries.[19] Other studies demonstrated that similar increases occurred when physicians acquired diagnostic imaging equipment.[20]

The substantial rise in the number of outpatient procedures reflected in the Strope, Pilote, and other studies raises serious concerns about the overutilization of medical services and the increased potential for poor patient outcomes. Researchers have shown, for instance, that unnecessary exposure to ionizing radiation increases the

incidence of cancer,[21] that excessive prescribing of antibiotics lessens resistance to infections,[22] and that overuse of heart stent implantations,[23] spinal-fusions,[24] hysterectomies,[25] and certain other surgical procedures enhances the risk of complications.[26]

Not only does overtreatment demonstrate disregard for scarce resources and for best practices; it also shows indifference toward patients' best interests. By way of example, the Maryland Board of Physicians in 2011 revoked the license of Mark Midei, a Baltimore cardiologist, for the unnecessary and fraudulent implantation of cardiac stents.[27] By his own admission, Midei performed about 800 stent operations in 2005 and 1,200 in 2007.[28] Such a large and increasing number of stent implantations prompted investigations by a Maryland hospital and a U.S. Senate Committee into Midei's medical practice.[29]

Though the Maryland board found Midei guilty of "gross overutilization of health care services," the decision to revoke Midei's license hinged on his falsification of laboratory tests. "Dr. Midei's willful creation of false percentage numbers for the degree of occlusion of coronary arteries is indefensible and amounts to a deliberate and willful fabrication of medical records," the board determined.[30] The Maryland board's emphasis on falsified tests underlay its determination to revoke Midei's license. Unfortunately, the board's opinion failed to more precisely address the problem of unnecessary care and treatment. Under the circumstances, the Maryland board missed an important opportunity to put physicians on notice that unnecessary surgery alone might call for disciplinary action.

The Need for State Licensing Board Intervention

What can the medical profession do, if anything, to discourage unwarranted and profligate spending? More than it is doing now, certain medical ethicists have insisted. "[T]he myth that physicians are innocent bystanders merely watching health care costs zoom out of control cannot be sustained," Howard Brody has asserted.[31] "Physicians cannot afford to ignore the profound logic of the link between care for individual patients and the costs of care," Christine Cassel and Troyen Brennan have contended.[32]

The justification for disciplining doctors who enhance their income at the expense of their patients' well-being seems apparent. Physicians who perform unnecessary tests and procedures violate all four recognized principles of medical ethics—nonmaleficence, beneficence, autonomy, and justice.[33] There is no need for ordering these principles, for placing more emphasis on any particular one of them. Efforts to stem overtreatment protect patients from harm, promote the fair distribution of scarce resources, and enhance the profession's standing.

in 2002, the American Board of Internal Medicine (ABIM) Foundation, along with the European Federation of Internal Medicine and the American College of Physicians, issued a global Charter on Medical Professionalism for the twenty-first century.[34] The Charter put forth three "fundamental principles" (patient welfare, patient autonomy, and social justice) and a "set of professional responsibilities" to guide physicians' interactions with patients, health care organizations, and society. Overutilization and wasteful spending received prominent attention. "The provision of unnecessary services not only exposes one's patients to avoidable harm and expense but also diminishes the resources available for others," the Charter's authors stated.

Following issuance of the Charter, several medical specialty societies sought to identify tests and procedures often overused in their respective specializations. After an exhaustive period of review, nine societies in April 2012 issued their "top five" questionable tests and procedures.[35] An additional eight specialty societies plan to release their top five in the near future.

The recent pronouncements of the national specialty societies should aid efforts of state medical boards to identify and discipline licensees for gross overutilization, unnecessary treatment, and wasteful spending. Because most physicians today are board certified in at least one specialty area, few doctors lack knowledge of evidence-based standards and guidelines concerning questionable tests and procedures. Those doctors who *consistently* ignore recognized standards and guidelines, placing their financial interests above their patients' welfare, warrant disciplinary action.

Recommendations

Few boards have the resources, the inclination, or the mandate to pursue licensees for unnecessary care and treatment. "We view ourselves as a catcher's mitt in that we do not seek out infractions, but rather respond to 1,500 reports that come to us each year," explained one board member. "From my own experience," another board member stated, certain specialists "are sometimes able to over-

utilize various tests and procedures without much consequence or notice because they manage to do so just within the range of acceptable medical practice and, therefore, below the radar of peers, hospital administrators or state regulators."[36]

For these and other reasons, state medical boards face at least two significant barriers to disciplinary action: (1) the asserted need to receive information concerning potential abuse before investigating, and (2) the ability of most offenders to provide some justification, however tenuous, for their treatment decisions. Notwithstanding these obstacles, boards can and should take certain steps to stem overtreatment and, in so doing, meet their obligations to protect the public.

First, boards should signal their intention to discipline egregious offenders, to show that overtreatment is a serious problem and that disciplinary action may be warranted. A good place to start would be for boards to amend their respective state laws or medical practice acts to include a specific ground for "clearly excessive treatment of patients." The Federation of State Medical Boards should take the lead in this endeavor. The Federation's *Model Medical and Osteopathic Act* does not include a specific disciplinary ground for overutilization; nor do medical practice acts in more than 60% of states (see Table 1). States that lack a specific ground currently charge offenders under a "catchall" provision, such as unprofessional conduct, substandard care, or fraudulent activity. Such "catchall" provisions are poor substitutes for more targeted laws that would increase awareness of the problem and boards' intent to discipline egregious offenders.

Second, state medical boards and the Federation should issue guidelines or recommendations on excessive care and treatment. In related areas, the Federation has issued guidelines, white papers, or has teamed with others to produce books or tracts on matters such as opioid prescribing.[37] The Federation could build on these related efforts by examining, collaborating with, and potentially incorporating the recently-released findings of several national specialty societies under the auspices of the ABIM Foundation and others as previously mentioned.

Conclusion

Few patients are capable of making informed decisions about the efficacy of diagnostic tests and medical procedures. Most patients require their physicians' help and assistance. Because doctors figure prominently in the selection of medical services, they are key to controlling health care costs in a fragmented delivery system. Though state medical boards cannot easily address widespread medical practices that lead to overspending, they can support the efforts of national specialty societies to establish evidence-based standards. Moreover, they can revise, if needed, their respective grounds for disciplinary action to more clearly identify and more easily discipline offending physicians. ■

About the author

Carl F. Ameringer, PhD, JD, is a Professor of Health Policy and Politics at Virginia Commonwealth University.

Acknowledgement: The author would like to thank Chelsea Olson for her assistance.

Endnotes

1. IOM (Institute of Medicine). 2012. Best care at lower cost: the path to continuously learning health care in America. Washington, D.C.: The National Academies Press.
2. Medical Board of California. Newsletters. Available at www.mbc.ca.gov. Accessed 11 April 2012; Florida Department of Health. Recent discipline by DOH against practitioners. Available at www.floridashealth.com. Accessed 11 April 2012; Missouri State Board of Registration for the Healing Arts. Newsletters. Available at www.pr.mo.gov/healingarts.asp. Accessed 13 April 2012; Vermont Board of Medical Practice. Board actions. Available at www.healthvermont.gov. Accessed 15 April 2012.
3. Kaiser Family Foundation. Health care costs: key information on health care costs and their impact. March 2009.
4. Organization for Economic Cooperation and Development. Health data 2011.
5. Anderson GF, Hussey PS, Frogner BK, Waters HR. Health spending in the United States and the rest of the industrialized world. *Health Affairs* 2005 24(4):903-914; Peterson CL, Burton R. CRS Report for Congress. U.S. health care spending: comparison with other OECD countries. 2007 Federal Publications. Paper 311; Emanuel EJ, Fuchs VR. The perfect storm of overutilization [Commentary] *JAMA* 2008 299(23):2789-2791; Laugesen MJ, Glied SA. Higher fees paid to US physicians drive higher spending for physician services compared to other countries. *Health Affairs* 2011 30(9):1647-1656; Roehrig CS, Rousseau DM. The growth in cost per case explains far more of US health spending increases than rising disease prevalence. *Health Affairs* 2011 30(9):1657-1663; Berwick DM, Hackbarth AD. Eliminating waste in US health care. *JAMA* 2012 307(14):1513-1516.
6. Peterson CL, Burton R. CRS Report for Congress. U.S. health care spending: comparison with other OECD countries. 2007 Federal Publications. Paper 311.
7. Organization for Economic Cooperation and Development. Health data 2011.
8. Reiman AS. Medical professionalism in a commercialized health care market [Commentary]. *JAMA* 2007 298(22):2668-2670; Emanuel EJ, Fuchs VR. The perfect

storm of overutilization [Commentary] *JAMA* 2008 299(23):2789-2791; Berwick DM, Hackbarth AD. Eliminating waste in US health care. *JAMA* 2012 307(14):1513-1516; Brody H. Medicine's ethical responsibility for health care reform—the top five list. *NEJM* 362(4):283-285; Cassel CK, Guest JA. Choosing wisely: helping physicians and patients make smart decisions about their care. *JAMA*; published online April 4, 2012.doi: 10.1001/*jama*.2012.476; Moyer VA. What we don't know can hurt our patients: physician innumeracy and overuse of screening tests. *Ann Intern Med* 2012 156(5):392-393.

9. Berwick DM, Hackbarth AD. Eliminating waste in US health care. *JAMA* 2012 307(14):1513-1516.
10. Cassel CK, Guest JA. Choosing wisely: helping physicians and patients make smart decisions about their care. *JAMA*; published online April 4, 2012.doi: 10.1001/*jama*.2012.476.
11. Rodwin MA. Medicine, Money, and Morals: Physicians' Conflicts of Interest. New York: Oxford Univ Pr, 1993; Relman AS. Medical professionalism in a commercialized health care market [Commentary]. *JAMA* 2007 298(22):2668-2670.
12. Starr P. The Social Transformation of American Medicine. New York: Basic Books, 1982; Campion F. The AMA and U.S. Health Policy since 1940. Chicago: American Medical Association, 1984; Johnson DA, Chaudhry H.J. Medical Licensing and Discipline in America. Lanham, MD: Lexington Books; 2012.
13. Arrow KJ. Uncertainty and the welfare economics of medical care. *American Economic Review* 1963 53(5):941-973.
14. Kirch DG, Vernon DJ. The ethical foundation of American medicine [Commentary]. *JAMA* 2009 301(14):1482-1484; Wynia MK. The Role of Professionalism and Self-regulation in Detecting Impaired or Incompetent Physicians [Editorial]. *JAMA* 2010 304(2):210-212; Relman AS. Medical professionalism in a commercialized health care market [Commentary]. *JAMA* 2007 298(22):2668-2670.
15. Ameringer CF. The Health Care Revolution: From Medical Monopoly to Market Competition. Berkeley, CA: Univ of California Pr; 2008.
16. Stevens RA. Medical specialization as American health policy: interweaving public and private roles. In: Stevens RA, Rosenberg CE, Burns LR, eds. Health and Health Policy in the United States. New Brunswick, NJ: Rutgers Univ Pr; 2006:49-79.
17. Berenson RA, Bodenheimer R, Pham HH. Specialty service lines: salvos in the new medical arms race. *Health Affairs* 2006. Web exclusive 25 July 2006:W337-W343; Pham HH, Ginsberg PB. Unhealthy trends: the future of physician services. *Health Affairs* 2007 26(6):1586-1598; Baker LC, Atlas SW, Afendulis CC. Expanded use of imaging technology and the challenge of measuring value. *Health Affairs* 2008 27(6):1467-1478.
18. Strope SA, Daignault S, Hollingsworth JM, Wei JT, Hollenbeck BK. Medicare reimbursement changes for ambulatory surgery centers and remuneration to urologic physician-owners. *J Urol* 2008 180(3):1070-1074; Strope SA, Daignault S, Hollingsworth JM, Zaujun Z, Wei JT, Hollenbeck BK. Physician ownership of ambulatory surgery centers and practice patterns for urologic surgery: evidence from the State of Florida. *Med Care* 2009 47(4):403-410.
19. Pilote L, Califf RM, Sapp S, Miller DP, Mark DB, Weaver WD, et al. Regional variation across the United States in the management of acute myocardial infarction. *NEJM* 1995 333(9):565-572.
20. Baker LC. Acquisition of MRI equipment by doctors drives up imaging use and spending. *Health Affairs* 2010 29(12):2252-2267.
21. Moyer VA. What we don't know can hurt our patients: physician innumeracy and overuse of screening tests. *Ann Intern Med* 2012 156(5):392-393; Swensen SJ. Patient-centered imaging. *Am J of Med* 2012 125(2):115-117.
22. Commonwealth Fund. Why not the best? Results from the national scorecard on U.S. health system performance, 2008. Available at www.commonwealthfund.org. Accessed 6 August 2012.
23. McKhann GM, Goldsborough MA, Borowicz LM, Selnes OA, Mellits DE, Enger C, et al. Cognitive outcome after coronary artery bypass: a one-year prospective study. *Ann Thorac Surg* 1997 63:510-515; Lange RA, Hillis DL. Use and overuse of angiography and revascularization for acute coronary syndromes. *NEJM* 1998 338(25):1838-1839.
24. Wang ST, Ma HL, Liu CL, Yu WK, Chang MC, Chen TH. Is fusion necessary for surgically treated burst fractures of the thoracolumbar and lumbar spine? A prospective, randomized study. *Spine* 2006 31(23):2646-2652.
25. Broder MS, Kanouse DE, Mittman BS, Bernstein SJ. The appropriateness of recommendations for hysterectomy. Obstet Gynecol 2000 95(2):199-205.
26. Commonwealth Fund. Why not the best? Results from the national scorecard on U.S. health system performance, 2008. Available at www.commonwealthfund.org. Accessed 6 August 2012.
27. Maryland State Board of Physicians. In the matter of Mark G. Midei, M.D. Final Decision and Order. 2011; 13 July.
28. Harris G. Doctor faces suits over cardiac stents. *The New York Times*. 2010; 5 Dec.
29. Harris G. Doctor faces suits over cardiac stents. *The New York Times*. 2010; 5 Dec.
30. Maryland State Board of Physicians. In the matter of Mark G. Midei, M.D. Final Decision and Order. 2011; 13 July.
31. Brody H. Medicine's ethical responsibility for health care reform—the top five list. *NEJM* 362(4):283-285.
32. Cassel CK, Brennan TE. Managing medical resources: return to the commons? *JAMA* 2007 297(22):2518-2521.
33. Kirch DG, Vernon DJ. The ethical foundation of American medicine [Commentary]. *JAMA* 2009 301(14):1482-1484.
34. ABIM Foundation, ACP-ASIM Foundation, European Federation of Internal Medicine. Medical professionalism in the new millennium: A physician charter. *Ann Intern Med* 2002 136(3):243-246.
35. ABIM Foundation. Choosing wisely: U.S. physician groups identify commonly used tests or procedures they say are often not necessary. 2012. Available at www.Choosing Wisely.org. Accessed 26 April 2012.
36. Author interviews of board members. 2012; 21 and 22 Oct.
37. Fishman SM. Responsible Opioid Prescribing: A Clinician's Guide. Washington, D.C.: Waterford Life Sciences; 2012 (2nd ed.).

Page intentionally left blank