Defense Health Board

Continuing Education for Department of Defense Health Professionals

November 24, 2015

November 24, 2015

MEMORANDUM FOR ACTING UNDER SECRETARY OF DEFENSE (PERSONNEL AND READINESS)

SUBJECT: Continuing Education for Department of Defense Health Professionals Report

      The Defense Health Board (DHB) is pleased to submit its report summarizing the findings and recommendations from our independent review of Continuing Education for Department of Defense (DoD) Health Professionals, as attached.

      On February 25, 2013, the Acting Under Secretary of Defense for Personnel and Readiness requested that the DHB review the full spectrum of health education options and offer recommendations on how to innovatively reduce training expenditures while ensuring DoD health professionals continue to meet their annual requirements for proficiency, licensure, and lifelong learning. In response, the DHB convened a subset of its members to review the literature, conduct roundtable discussions, and receive briefings from subject matter experts in the area of continuing education. This report is a culmination of that effort and represents a consensus of members of the DHB.

      We believe the recommendations provided in this report will assist DoD in identifying opportunities to enhance the efficiency and quality of the overall continuing education program. On behalf of the DHB, I appreciate the opportunity to provide the Department with this independent review of continuing education for DoD health professionals.

Nancy W. Dickey, M.D.
President, Defense Health Board

Attachments:
As stated

cc:
ASD(HA)

[This page is intentionally left blank]

Table of Contents

DEFENSE HEALTH BOARD MEMBERS

Maj Gen (Ret.) George K. Anderson,
MD, MPH*
DHB Second Vice President

John Baldwin, MD

M. Ross Bullock, MD, PhD

Bonnie Carroll, BA

Nancy W. Dickey, MD*
DHB President

GEN (Ret.) Frederick Franks

Steven M. Gordon, MD

John Groopman, PhD

Eve J. Higginbotham, SM, MD

David Allen Hovda, PhD

Col (Ret.) Donald Jenkins, MD, FACS,
DMCC

RADM (Ret.) H. Clifford Lane, MD*

Gen (Ret.) Richard Myers
DHB First Vice President

Dennis S. O'Leary, MD*

Gregory A. Poland, MD*

*Member of the Continuing Health
Education subset

EXECUTIVE SUMMARY

The Military Health System (MHS) is one of the largest health care systems in the United States[1] and provides care to approximately 9.6 million eligible beneficiaries.[2] The mission of the MHS is to enhance the Department of Defense's (DoD's) and the Nation's security by providing health care support for the full range of military operations and by sustaining the health of all those entrusted to DoD's medical care.[3] To support the provision of quality care in the unique military environment, military and civilian health professionals must meet licensing and associated continuing education (CE) requirements. Health professionals with specialty certifications may require additional CE. In addition, military health professionals must maintain competencies in military and medical readiness skills.[4,5] Thus, the MHS has an obligation to provide effective CE programs to sustain proficiency in both medical and military domains.

Currently, DoD is operating in a financially constrained environment while health care costs continue to rise.[1] This has resulted in aggressive efforts to identify opportunities to reduce costs and improve efficiency in all aspects of the health care system, including CE. In this context, policies were issued between 2011 and 2013 directing stronger oversight of conference attendance and decreased spending for conference-related travel[6-10] as a result of high profile misspending by federal agencies at national conferences.[11] However, these policy directives have limited the ability of military health professionals to host and participate in CE conferences.[11,12] Despite these limitations, the MHS remains responsible for maintaining health professionals' competencies through CE and military training in order to provide the best possible care to its beneficiaries. In addition, the MHS is aspiring to become a high reliability organization (HRO), which requires a commitment to becoming a continuous learning organization.[13,14] Thus, the MHS has multiple incentives to identify the most cost-effective approaches to provide exceptional CE for its health professional workforce.

CHARGE TO THE DEFENSE HEALTH BOARD

On February 25, 2013, the Acting Under Secretary of Defense for Personnel and Readiness (USD(P&R)) requested that the Defense Health Board (DHB) review the spectrum of continuing health education (CHE) options and offer recommendations on how to reduce training expenditures while ensuring that health professionals meet their educational requirements (see Appendix A). The request acknowledged that DoD is operating in a severely constrained fiscal environment and is looking for opportunities to reduce costs while remaining operationally viable, particularly with regard to CHE. In response to the USD(P&R)'s tasking, the DHB convened a subset of its members to review the literature, conduct roundtable discussions, and receive briefings from subject matter experts and DoD personnel involved in CHE efforts.

The subset of DHB members developed Terms of Reference (see Appendix B) to define the scope of the investigation and a set of Guiding Principles (see Box 1). The members held in-person and virtual meetings to receive briefings and consultations from subject matter experts in pertinent fields from various institutions. Appendix C contains a complete list of meetings and briefings held. Of note, this report primarily uses the term CE rather than CHE, since much of the literature cited regarding educational activities for health professionals uses this terminology.

Box 1: Guiding Principles

The following Guiding Principles were adopted as a foundation in the review of CE for DoD health professionals.

Overarching Principle:
DoD has a duty to provide health professionals the CE opportunities necessary to maintain a level of competency that not only meets State licensing requirements and professional standards, but also allows them to receive mentorship and career guidance through interactions with other professions and ultimately provide the best possible care to military beneficiaries.

Guiding Principles:
The recommendations provided by the DHB, when taken as a whole, must address advancements in education and technology, and take into consideration:

   i.   The spectrum of health professions, licensing requirements, and educational needs;
   ii. Best practices in CE based on the strengths and limitations of various delivery modalities;
   iii. The social aspects of health, including changing social patterns and population needs;
   iv. The policies and practices of academic and professional organizations regarding CE;
   v.   The fiscal environment; and
   vi. The effectiveness of both distance and in-person learning.

The key question posed to the DHB was how to reduce the costs associated with CE for health professionals while ensuring they meet educational requirements, maintain competency, and continue to provide the best possible care to beneficiaries. The current trend in CE has shifted away from simply achieving credit hours to "demonstrably changing professional practice and patient outcomes."[15(p.16)] Additional changes in health care practice, such as incorporation of evidence-based medicine, interprofessional education, and measuring and demonstrating competencies, have also influenced the field of CE. These movements are reflected in the *Military Health System Review: Final Report to the Secretary of Defense,* which includes recommendations "directed at system enhancements to address areas of concern and to drive changes that will foster creation of a high reliability health system."[14(p.1)] Such health systems emphasize "harm prevention and quality improvement,"[14(p.1)] establishing a culture of quality, safety, and process improvement.[14] At this transformative point in the field of CE, the MHS has an opportunity to be among the leaders in providing comprehensive, effective, and innovative CE that serves to achieve high reliability at all levels of care.

Assessing the costs of CE is complex and, like many large health care organizations,[15] MHS has found it challenging to accurately determine the overall costs associated with providing CE. Improved cost data collection would be useful in determining the relative value of CE initiatives and their impact on health care outcomes of interest. When identifying opportunities for DoD to reduce the costs of offering or paying for CE without adversely affecting quality or safety of care, the following areas should be considered: (1) initial investment and maintenance costs; (2)

improving efficiency without adversely affecting care; and (3) assessing the downstream cost savings that may occur as a result of an effective CE program.[16,17]

The 2010 joint Association of American Medical Colleges/American Association of Colleges of Nursing report *Lifelong Learning in Medicine and Nursing* encourages policy makers at all levels "to consider the importance of lifelong learning relative to its contribution to improved quality, patient safety, provider retention, cost-effectiveness, and overall impact on the health care system."[18(p.23)] The American Nurses Credentialing Center also emphasizes that "Outcome metrics, or quantifiable outcome measures, serve as a foundation for assessing the value of CNE [continuing nursing education] for improved performance, and the value of investing in CNE for the individual nurse, patients and the health care system."[19(p.2)] If DoD can identify and correlate outcomes with CE activities, this would provide a mechanism to estimate cost savings and the impact of CE on performance. Thus, determining how to implement a comprehensive CE program in the most cost-effective manner requires a systems approach in which the interaction of a variety of factors must be considered. This review of CE for DoD health professionals highlights areas of significance for the MHS and attempts to provide direction to build a better overall CE program.

Overarching Finding: An effective and fiscally responsible continuing education program should improve the performance of a complex health care system. Given DoD's extensive health care expertise, comprehensive practice environment, and worldwide delivery of care, it is uniquely positioned to be among the leaders in the development of a model continuing education program for health professionals.

Overarching Recommendation: In an effort to establish itself as a leader in the field of continuing education, DoD should implement a centralized, innovative, multimodal, cost-effective continuing education program that employs the latest educational and technological advancements; provides an efficient infrastructure to plan, track, and deliver continuing education; and uses a systems approach that integrates measures of access, quality, patient safety, medical readiness, and efficiency in assessing program effectiveness.

CONTINUING EDUCATION REQUIREMENTS AND POLICIES FOR HEALTH PROFESSIONALS

For both civilian and military health professionals, CE requirements are determined in part by professional licensure and certification requirements. In addition, military health professionals must also complete military and medical readiness training requirements. This may include training in multiple areas such as weapons proficiency, aeromedical evacuation procedures, treatment of traumatic injuries and endemic infectious diseases, and management of chemical, biological, radiological, nuclear and explosive casualties, to name a few.[5] Each State board that licenses health professionals has its own unique requirements for initial licensure and renewal.[20-23] Further, licensing and certification requirements are dynamic in nature and differ among health profession fields and specialties.[24-26] Application or renewal fees are typically required to obtain or maintain health professional licenses and certifications. For CE and certification expenses, there are some disparities within and among the Military Departments and the Defense

Health Agency (DHA) with respect to reimbursement to individual health professionals, sometimes depending on local organizational budgets and priorities.[20-22]

Although there have been recent improvements, the current policies on conference attendance/participation issued by the Office of Management and Budget, the President, and the Deputy Secretary of Defense have resulted in an approval process that is inefficient and counterproductive.[12] The administrative burden and restrictions imposed by these policies cause significant delays in approval for DoD health professionals to present their work at professional conferences, complicate planning efforts of conference organizers, and leave a negative perception of DoD as a reliable partner. More efficient mechanisms are available to control costs, including budgeting, establishing predetermined priorities for CE expenditures, and delegating approval authority to the lowest appropriate command level.[*]

Additionally, administrative practices and policies vary among the Military Departments. For example, reimbursement policies for Maintenance of Certification exams differ. In the increasingly Joint environment, these inconsistencies may create tension among military health professionals and negatively affect retention. There are also opportunities to decrease costs and improve efficiency in the current processes for provision and tracking of CE within the military. For example, each of the Military Departments has an entity accredited to provide continuing medical education (CME) and CNE at a minimum, and they each maintain separate offices to administer these activities. Each accredited provider must periodically apply for and renew this accreditation, paying associated fees in addition to maintaining a staff to review and approve CE activities, keep appropriate records, and provide other administrative support. These costs and resources are duplicated among the Military Departments to provide the same service. Despite having accredited CE providers within DoD, there currently is no mechanism to submit a single request for simultaneous accreditation of CE for a broad range of health professions beyond just CME/CNE. Thus, some MHS organizations continue to use contractors to accredit their CE offerings to allow one-stop acquisition of CE accreditation for a wide range of health professions. Another area of duplication is the maintenance of multiple online learning management systems for health care-related education and training. However, the DHA is currently working to consolidate many of these systems into a single, enterprise-wide system and anticipates realizing significant cost savings as a result of this effort.[28]

---

[*] New DoD conference guidance was published by the Deputy Secretary of Defense September 23, 2015, after this report's findings and recommendations were publically deliberated on August 20, 2015.[27] The new guidance sets forth three major changes: (1) delegation of waiver of approval authority for conferences is simplified into three categories, including delegation to levels consistent with law and Office of Management and Budget guidance, and also encourages g pre-approval of recurring conferences; (2) tracking of attendance at non-DoD conferences in advance is eliminated except when it is expected that the conference will cost more than $100,000, and approval authority for attendance at such conferences is delegated to the lowest appropriate level; and (3) reporting through the DoD Conference Tool is limited to legally directed requirements for public reporting and reporting to Component Inspectors General.[27]

Finding 1 – Conference Approval Processes: Current DoD policy has resulted in significant administrative overhead and long approval times for health professionals who request to participate in continuing education conferences. These delays have prevented military health professionals from participating in and, in some cases, being invited to present at these conferences.

> **Recommendation 1:** DoD should establish a continuing education budget and delegate approval authority to the military treatment facility Commander level or equivalent to create a timely, streamlined approval process for military health professionals to participate in continuing education conferences.

Finding 2 – Differences among Military Departments and the Defense Health Agency: There are differences among the Military Departments and the Defense Health Agency in administrative and funding practices, procedures, and policies for continuing education and (re)certification activities. Given the increase in joint manning at military treatment facilities, these disparities may affect the morale and retention of military health professionals. In addition, having multiple administrative processes for approval of continuing education or certification activities introduces inefficiencies.

> **Recommendation 2.1**: DoD should implement policies to specify consistent processes and equitable funding opportunities for continuing education and (re)certification for health professionals across the MHS.

> **Recommendation 2.2:** DoD should provide a common, web-based application to submit requests for approval to host or participate in all continuing education activities, including participation in non-DoD sponsored professional conferences. Expanding the capability of the Medical Operational Data System to include these functions and cover all health professions with accredited continuing education would be one option to accomplish this.

Finding 3 – Consolidation of DoD Continuing Education Providers and Learning Management Systems: DoD currently has multiple entities accredited as continuing education providers and is not using a common system to plan, provide, and track continuing education, which results in duplication of expenditures.

> **Recommendation 3:** In coordination with the Uniformed Services University of the Health Sciences and the Military Departments, DoD should establish a central office of continuing education for health professionals under the Defense Health Agency Education and Training Directorate. This office should:
> a. Serve as the consolidated accredited continuing education administrator for DoD.
> b. Continue to develop and maintain a single learning management system delivery platform with planning and bi-directional tracking capabilities to support the Military Departments in managing continuing education for health professionals while reducing the administrative burden to the individual and the system.

The Full Spectrum of Continuing Education Options

There are multiple options available to meet CE requirements. These include attending conferences and lectures, reading or reviewing journal articles or other medical reference materials, and teaching. Traditionally, CE was achieved by attending meetings or conferences in person. However, with technological advancements, there has been an increase in distance-learning options as well as other mixed modality CE activities, such as simulation-based medical education. In addition, there appear to be significant opportunities to improve the availability of DoD distance-learning options for medical topics of operational significance, such as aerospace, environmental, and undersea medicine, which would provide more accessible learning options to improve military readiness. Providing a mechanism to facilitate this process, such as an online course development template, would allow subject matter experts within DoD to collaborate in rapidly developing new CE content for peer review and distribution.

Finding 4 – Continuing Education Resources: There are currently a wide variety of continuing education resources and reference materials available to DoD health professionals. However, finding these resources can be challenging, as there is no dedicated continuing education web portal to provide a single, organized access point to this information.

> **Recommendation 4:** DoD should create and maintain a dedicated continuing education web portal to provide a single gateway to all continuing education resources available to DoD health professionals, including links to appropriate resources outside of DoD.

Finding 5 – Unique DoD Medical Expertise: There is a wealth of unique operational expertise within the MHS on topics of medical significance with potential civilian applications. DoD could improve access to essential medical readiness education and training for military and civilian health professionals by creating online continuing education offerings on key topics such as aerospace, environmental, and undersea medicine in addition to expanding availability of other medical readiness topics.

> **Recommendation 5:** DoD should leverage its medical expertise by developing unique continuing education opportunities to enhance military readiness and share expertise broadly with civilian health professionals.

Continuing Education Outcomes and Effectiveness

CE needs vary by specialty, health care function, and educational goals. There are also many modalities for providing CE, each with variable effectiveness in changing health professional behavior and achieving desired patient outcomes. For example, various organizations[15,18,29,30] have recommended interprofessional education for health professionals, which has a demonstrated positive impact on collaborative team behavior, reduction of clinical error rates, improved patient outcomes, and improved information sharing.[31] Although the MHS currently uses interprofessional education models in certain CE activities, there may be additional opportunities to incorporate this approach. Additionally, recent reviews of CE research indicate that assessing and comparing studies to determine the effectiveness of CE is complicated by a lack of common terminology and approaches to the conduct of research in this area.[32] Thus, as DoD embarks on efforts to assess the effectiveness of CE programs, it will be important to

ensure that the terminology and approaches used are consistent with those of other leading organizations in this area.

Leading experts in health care systems have acknowledged the importance of assessing the effectiveness of CE in the context of patient safety and quality.[33-35] This is an aspirational goal, and an evolutionary process of determining the best approaches and metrics to achieve this is still in progress. Innovative approaches to organization and foresight in developing information technology requirements are necessary to move purposefully in this direction. Co-location of CE, quality, patient safety, and credentialing personnel/functions may be one organizational approach to enhancing collaborative improvement efforts and improving visibility of the impact of one element of the system on others.

Furthermore, the benefits of CE, both financial and institutional, may not always be readily apparent. The outcomes of CE, beyond simple accumulation of credit hours, have proven difficult to measure and the impact on performance may only be evident over extended periods of time. Improving the ability to assess the impact of CE on a health care delivery system using access, quality, patient safety, and efficiency metrics would provide a feedback loop to continually target CE offerings to achieve the greatest improvement.

As recommended in the 2014 *Military Health System Review: Final Report to the Secretary of Defense*, the MHS is moving toward becoming a high reliability and rapid learning organization.[14] The use and continued refinement of outcome and performance metrics will be important in assessing the impact of quality improvement interventions. These metrics will also provide an additional tool to influence the performance of health care institutions and reduce costs. Although the *Military Health System Review: Final Report to the Secretary of Defense* assessed training of health professionals in the areas of access, safety, and quality, it was not intended to assess the organization and effectiveness of medical readiness training.[†] Following Operation DESERT STORM, both the DoD Inspector General and the General Accounting Office conducted independent reviews of deployment medical operations in the Military Departments and identified areas for improvement in medical readiness training.[36-40] However, similar independent reviews were not located examining medical readiness training during the Global War on Terror. Although there are ongoing internal efforts to continually improve medical readiness sustainment training, the planned drawdown from the current conflicts, fiscal constraints, and decreases in emergency care and inpatient capabilities in military treatment facilities will impact the ability of military health professionals to maintain clinical currency.[41] Thus, periodic independent reviews of the content and effectiveness of medical readiness sustainment training may identify additional areas for improvement across career fields and Military Departments.

[†]Medical readiness training includes "courses, hands-on training programs, and exercises designed to develop and enhance survival skills and maintain military medical skills, and addresses individual, collective and unit training, both initial and sustainment, required to ensure that healthcare personnel and units are capable of performing operational missions."[5]

Finding 6 – Interprofessional Education: Recent reviews of continuing education research indicate significant benefits are associated with well-designed interprofessional education activities.[31]

> **Recommendation 6:** DoD should continually review the effectiveness of interprofessional education initiatives to identify opportunities to add, modify, or delete activities to optimize educational benefits.

Finding 7 – Assessing Continuing Education Effectiveness: A review of current literature suggests that research on the effectiveness of continuing education has been hindered by inconsistent terminology, definitions, methodology, and outcome metrics. This creates challenges in determining the most effective approach to measuring, achieving, and maintaining competency.

> **Recommendation 7.1:** DoD should collaborate with other stakeholders to develop a common approach and methodology for assessing the effectiveness of continuing education in accomplishing specific health care goals.

> **Recommendation 7.2:** DoD should lead the health care field in facing these challenges through the research, development, application, and delivery of new technologies and learning theories to provide exceptional, cost-effective, evidence-based continuing education.

Finding 8 – Relationship between Continuing Education and Performance Trends: Effective continuing education that has a positive impact on performance metrics should result in cost savings. DoD does not have an integrated system to assess the relationship between continuing education and individual, institutional, and enterprise performance trends in patient safety, quality, cost, and efficiency.

> **Recommendation 8:** DoD should explore the design, creation, and implementation of an integrated system to develop appropriate continuing education initiatives and related metrics in order to support a culture of patient safety and improve quality, cost of services, and efficiency of operations at the individual, institutional, and enterprise levels.

Finding 9 – Performance Improvement: The 2014 *Military Health System Review: Final Report to the Secretary of Defense* highlighted the need to support performance improvement with better analytics, greater clarity in policy, and aligned training and education programs.[14]

> **Recommendation 9**: Consistent with the *Military Health System Review: Final Report to the Secretary of Defense*, DoD should develop, periodically update, and use access, quality, and patient safety metrics to prioritize and target continuing education toward those areas needing the most improvement at both the institutional and enterprise levels.

Finding 10 – Medical Readiness: With the drawdown of personnel and changes in the MHS infrastructure, new challenges in medical readiness training are emerging.

> **Recommendation 10**: To supplement ongoing internal reviews, the Defense Health Agency, on behalf of the MHS, should conduct periodic independent reviews of the content and effectiveness of general and career field specific medical readiness sustainment training. The results of these reviews should be used to prioritize and target future training and continuing education toward those areas needing the most improvement at both the institutional and enterprise levels.

CONTINUING EDUCATION AS IT RELATES TO PROFESSIONAL DEVELOPMENT

Self-directed learning has an important role in the education of adult professionals.[42-45] However, individuals may not always be aware of their specific knowledge or performance gaps.[32] Thus, external feedback in the form of peer review, supervisory input, and/or institutional priorities provide opportunities to assist health professionals in targeting CE to improve performance, address deficiencies, and enhance their value to an organization. Therefore, individual health professionals could benefit from identifying and articulating their learning needs in individual professional development plans with institutional and supervisory guidance.

Recording completion of a minimum number of CE credit hours has been the standard for maintaining licensure and certification of health professionals. However, the fields of CE and health care are evolving away from basic credit hour completion to a new focus on health outcomes and related performance metrics. The American Board of Medical Specialties has developed a Maintenance of Certification program based on a series of competencies to provide high-quality care for the diagnosis and treatment of disease, promote health and disease prevention, and provide physical and emotional support for patients and families. This program targets the full scope of health care practice continuously, well beyond basic CE. Also, biomedical information is expanding and changing at a rapid rate. The science of CE is also evolving as new approaches and delivery modalities are developed and their effectiveness is assessed. Thus, continuous adaptation and improvement will be required to maximize the effectiveness of any CE program.

In-person meetings and conferences provide an opportunity to meet CE requirements as well as develop professional networks, share knowledge, provide mentorship, and enhance team-building skills and trust among health professionals. The 2007 Josiah Macy, Jr. Foundation report, *Continuing Education in the Health Professions*, acknowledged the importance of professional conferences in "promoting socialization and collegiality among health professionals" and "opportunities for cross-disciplinary and cross-generational learning and teaching."[29(p.18)] The opportunity to interact with professional colleagues is generally recognized as beneficial, although quantifying that benefit is challenging.

Budgetary mechanisms, appropriate prioritization criteria, and equitable opportunity should guide the process to provide predictability for DoD health professionals to participate in professional conferences and meetings. In particular, it is imperative that health professionals

who are presenting scientific work at professional conferences receive timely approval to participate. However, DoD conference policies, such as the use of non-federal sources to fund conference travel, have been cumbersome for DoD health professionals to navigate.

Finding 11 – External Feedback for Continuing Education Planning: There is a need for external feedback to the individual health professional to ensure knowledge and performance gaps are identified and incorporated into continuing education planning.

> **Recommendation 11:** DoD health professionals, with peer review and supervisory input, should create and periodically update professional development plans to provide balanced and cost-effective individual and interprofessional team continuing education roadmaps targeted to knowledge and performance gaps and goals.

Finding 12 – Maintenance of Competency: The focus of continuing education is moving toward maintenance of competency, lifelong learning, and outcome-based effectiveness.

> **Recommendation 12:** DoD should seek to be a leader in responding to the changing focus of continuing education by implementing a mechanism to continually monitor, evaluate, and improve the continuing education program to accomplish these aims.

Finding 13 – Importance of In-Person Interactions: Personal interactions during meetings and conferences provide essential opportunities for skills transfer, collaboration, information sharing, establishing trust among colleagues, mentorship, and professional development that benefit both the military and civilian health systems.

> **Recommendation 13.1:** DoD should ensure that DoD health professionals have opportunities for regular in-person participation in continuing education meetings and conferences.

> **Recommendation 13.2:** Given the strategic benefit to DoD and its partnership with the civilian health system, additional priority for funding should be given to individuals serving as a presenter, moderator, or military liaison at an approved conference or meeting.

> **Recommendation 13.3:** DoD should clarify and where possible simplify approval processes for non-federal source travel and expedite approval, within ethics and conflict of interest guidelines, for invited DoD presenters and contributors who are utilizing non-federal source travel.

THE FUTURE OF CONTINUING EDUCATION WITHIN THE DEPARTMENT OF DEFENSE

Various reports by expert panels that aim to improve the relevancy and effectiveness of CE activities have reviewed and provided recommendations for the transformation of CE for health professionals. Key themes in these recommendations include development and use of a common language to describe and assess CE, continued research and evaluation of the most effective CE

methods, and incorporation of more interprofessional education opportunities. Additionally, development of lifelong learning skills has been emphasized. In summary, the reports focus on moving toward outcome-based education, including the development and use of metrics to assess the impact of CE on areas such as quality and patient safety, in contrast to simply documenting completion of required hours.[46]

The 2014 *Military Health System Review: Final Report to the Secretary of Defense* highlighted the need for clear policy on and compliance with education and training requirements in the areas of access, quality management, and patient safety. Patient safety programs, in particular, focus on design and delivery of innovations and solutions to promote safe practices and advance the culture of safety. Integral to this is driving organizational change through the implementation of evidence-based practices to ensure safe care for all patients. Health professionals often learn about the evidence for new practices through timely CE. In addition, growing evidence from organizations that have achieved high reliability in health care delivery promotes the centrality of continuous learning to support the strategic business goals and objectives of the organization while fostering a culture dedicated to excellence, innovation, teamwork, and continuous improvement.[13,47,48]

CONCLUSION

This report presents a number of recommendations to enhance the ability of the MHS to provide cost-effective CE to maintain the readiness of DoD health professionals. The MHS is uniquely positioned to be a leader in developing a model system of CE for its health professionals. However, this will require improved coordination and integration of CE efforts. As part of its shared service functions, the DHA Education and Training Directorate will have a key role in coordinating this effort to develop a more integrated system of CE within the MHS. These functions include establishing an enterprise-wide eLearning tool, consolidating and streamlining administrative and oversight functions, coordinating professional development and sustainment programs, and facilitating centralized training review processes.[49] The plan for reform of the administration of the MHS also states the Directorate will "oversee and manage administrative and support activities…to include continuing education credit granting, [and] conference approval package development."[50(p.22)] A central office dedicated to CE with these functions could coordinate and promote the efficient and effective accomplishment of CE goals, including creation of consistent policies and procedures for CE. This effort will require significant cooperation between the DHA and the Military Departments, to consolidate appropriate support functions within the DHA without infringing on the role of the Military Departments to train and equip their forces.

Currently, CE is moving toward outcome-based education, practice-based education, interprofessional education, and assessing the impact of CE on quality and patient safety. As the MHS moves toward becoming an HRO, having aligned training and education programs on quality and patient safety will help accelerate those efforts. The DHB supports ongoing MHS CE initiatives and has suggestions for others, such as the creation of a single MHS online portal to allow efficient access CE resources and policy. Consolidation of administrative and support activities, along with the plan to adopt a single learning management system, would improve the ability to plan, track, deliver, and assess the effectiveness of CE within the MHS. MHS efforts to adopt a core set of access, quality, and patient safety metrics, as recommended in the *MHS*

Review, will provide leadership better tools to assess the impact of interventions on those outcomes. Using these metrics as part of a feedback loop to evaluate the performance of the health system and the health professionals within that system could also promote prioritization of education and training opportunities for health professionals. Furthermore, including needs assessments to determine knowledge gaps and medical readiness training requirements and providing feedback on DoD health professionals' performance may result in more effective CE programs.[32]

Additionally, participation in professional conferences and meetings provides many benefits to both the civilian and military health communities, as well as individual health professionals. DoD should continue to support participation in professional conferences and meetings to the greatest extent possible on a prioritized basis. It is likely that funding for CE will fluctuate relative to the overall DoD budget. However, it is important to have a structured approach to adapt and ensure the most critical components of CE are accomplished even during the financially lean years. Therefore, DoD health professionals should develop and continually refine professional development plans including required and desired multi-year CE milestones, and contingency plans to accomplish the most important goals at little or no cost.

ABOUT THIS REPORT

The DHB recognizes that the MHS includes a broad spectrum of health professionals with a variety of educational requirements and professional needs. Although this report does not provide a comprehensive review of all health professionals' CE requirements, the guiding principles and recommendations are applicable to all health professionals in general. Similarly, although the report highlights specific health professions, including physicians and nurses, the intent is to illustrate general principles applicable to all health professionals. Also, because many individuals in the health care field not directly involved in patient care may require CE, such as health care administrators and public/environmental health specialists, the report often refers to "health professionals" as opposed to "health care professionals." Overall, the report addresses the six issues highlighted in the Terms of Reference (Appendix B).

Section 1 of this report provides introductory and background information regarding CE. Section 2 examines current CE requirements and policies for health professionals, including unique military requirements. This section also describes the spectrum of CE options typically available to health professionals and their effectiveness. Section 3 explores CE as it relates to professional development, recognizing that CE is but one of several facets of overall professional growth. Section 4 describes the role of CE in the future, highlighting the ongoing evolution of health education and professional development and identifying the potential for DoD to be a leader in this area.

References

1.   U.S. Government Accountability Office. *Electronic Health Records: VA and DOD Need to Support Cost and Schedule Claims, Develop Interoperability Plans, and Improve Collaboration.* Washington, DC; 2014. GAO-14-302.
2.   U.S. Department of Defense. *United States Department of Defense Fiscal Year 2015 Budget Request Overview.* Washington, DC: Office of the Under Secretary of Defense (Comptroller)/ Chief Financial Officer;2014.

3. U.S. Department of Defense. *The Military Health System Strategic Plan: A Roadmap for Medical Transformation.* Washington, DC 2007.

4. Hosek SD, Cecchine G. Medical Readiness and Operational Medicine. *Reorganizing the Military Health System: Should There Be a Joint Command?* Santa Monica, CA: RAND Corporation 2002:43-55.

5. U.S. Department of Defense. Medical Readiness Training. In: U.S. Department of Defense, ed. *Department of Defense Instruction 1322.24*. Washington, DC 2011.

6. Lew J. Eliminating Excess Conference Spending and Promoting Efficiency in Government. In: Executive Office of the President Office of Management and Budget, ed. Washington, DC 2011.

7. The White House Office of the Press Secretary. Executive Order 13589: Promoting Efficient Spending. Washington, DC 2011.

8. Zients Z. Promoting Efficient Spending to Support Agency Operations. In: Executive Office of the President Office of Management and Budget, ed. Washington, DC 2012.

9. Carter A. Implementation of Conference Oversight Requirements and Delegation of Conference Approval Authority. In: Deputy Secretary of Defense, ed. Washington, DC 2012.

10. McGrath E. Implementation of Updated Conference Oversight Requirements. In: Deputy Chief Management Officer, ed. Washington, DC 2013.

11. O'Keefe E. GSA Vegas scandal prompts bills that would gut spending on federal agency conferences [Web page]. 2012. http://www.washingtonpost.com/blogs/2chambers/post/bills-curbing-federal-agency-conference-introduced/2012/04/20/gIQASexaVT_blog.html.

12. U.S. Government Accountability Office. *Defense Science and Technology: Further DOD and DOE Actions Needed to Provide Timely Conference Decisions and Analyze Risks from Changes in Participation.* Washington, DC 2015.

13. Schilling L, Dearing J, Staley P, Harvey P, Fahey L, Kuruppa F. Kaiser Permanente's performance improvement system, part 4: Creating a learning organization. *The Joint Commission Journal on Quality and Patient Safety.* 2011;37(12):544-552.

14. U.S. Department of Defense. *Military Health System Review: Final Report to the Secretary of Defense.* Washington, DC 2014.

15. Committee on Planning a Continuing Health Professional Education Institute, Board of Health Care Services, Institute of Medicine. *Redesigning continuing education in the health professions.* Washington, DC: National Academies Press 2010.

16. U.S. Government Accountability Office. *Defense Health Care Reform: Actions Needed to Help Realize Potential Cost Savings from Medical Education and Training.* Washington, DC 2014.

17. U.S. Government Accountability Office. *Defense Health Care Reform: Actions Needed to Help Ensure Defense Health Agency Maintains Implementation Progress.* Washington, DC 2015.

18. Association of American Medical Colleges, American Association of Colleges of Nursing. Lifelong learning in medicine and nursing, final conference report. 2010; Washington, DC.

19. American Nurses Credentialing Center. *The Importance of Evaluating the Impact of Continuing Nursing Education on Outcomes: Professional Nursing Practice and Patient Care.* 2014. http://www.nursecredentialing.org/Accreditation/ResourcesServices/Evaluating-the-Impact-CNE-Outcomes.pdf. Accessed June 12, 2015.

20. U.S. Department of the Army. Professional Education and Training Programs of the Army Medical Department. In: U.S. Department of the Army, ed. *Army Regulation 351-3*. Washington, DC 2007.

21. U.S. Department of the Air Force. Professional Board and National Certification Examinations. In: U.S. Department of the Air Force, ed. *Air Force Instruction 41-104*. Washington, DC 2014.

22. U.S. Department of the Navy. Policies and Procedures for Funding Professional Credentials and Certification Examinations. In: U.S. Department of the Navy, ed. *BUMED Instruction 1500.20*. Washington, DC 2014.

23. Federation of State Medical Boards. *Continuing Medical Education, Board by Board Overview.* Federation of State Medical Boards; 2014.

http://www.fsmb.org/Media/Default/PDF/FSMB/Advocacy/GRPOL_CME_Overview_by_State.pdf. Accessed July 31, 2014.

24. Federation of State Medical Boards. State-specific requirements for initial medical licensure [Web page]. 2014; http://www.fsmb.org/policy/public-resources/state_specific. Accessed April 13, 2015.

25. National Council of State Boards of Nursing. *State and Territorial Boards of Nursing: What Every Nurse Needs to Know.* 2011. https://www.ncsbn.org/What_Every_Nurse_Needs_to_Know.pdf. Accessed April 13, 2015.

26. American Academy of Physicians Assistants. Statutory and regulatory requirements for licensure and license renewal [Web page]. https://www.aapa.org/WorkArea/DownloadAsset.aspx?id=599

27. Work R. Update DoD Conference Guidance. Washington, DC 2015.

28. Defense Health Agency. Learning management systems migration [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training/Learning-Management-Systems-Migration. Accessed April 20, 2015.

29. Continuing education in the health professions: Improving healthcare through lifelong learning, proceedings of a conference sponsored by the Josiah Macy, Jr. Foundation. 2007; New York, New York.

30. Health Professions Network Nursing and Midwifery Office. *Framework for Action on Interprofessional Education & Collaborative Practice.* Geneva, Switzerland: World Health Organization;2010.

31. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: Effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst. Rev.* 2013;3:CD002213.

32. Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: Effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):69s-75s.

33. Elkin PL, Gorman PN. Continuing medical education and patient safety: An agenda for lifelong learning. *Journal of the American Medical Informatics Association: JAMIA.* Nov-Dec 2002;9(6 Suppl 1):s128-s132.

34. Association of American Medical Colleges. Faculty development resources: quality improvement and patient safety [Web page]. https://www.aamc.org/initiatives/cei/te4q/267686/general.html. Accessed July 25, 2015.

35. American Nurses Credentialing Center. *Continuing Education Research Studies.* 2013. http://www.nursecredentialing.org/Documents/Accreditation/CE-ReferencesTable.pdf. Accessed July 25, 2015.

36. U.S. Department of Defense Inspector General. *Medical Readiness Training for Reserve Physicians.* Arlington, VA: U.S. Department of Defense Inspector General;1996.

37. U.S. General Accounting Office. *Medical Readiness Training: Limited Participation by Army Medical Personnel.* Washington, DC 1993.

38. U.S. General Accounting Office. *Operation DESERT STORM: Full Army Medical Capability Not Achieved.* Washington, DC 1992.

39. U.S. General Accounting Office. *Operation DESERT STORM: Improvements Required in the Navy's Wartime Medical Care Program.* Washington, DC 1993.

40. U.S. General Accounting Office. *Operation DESERT STORM: Problems with Air Force Medical Readiness.* Washington, DC 1993.

41. Office of the Air Force Materiel Command Surgeon. Concept of Operations (CONOPS) for Sustained Medical and Readiness Trained (SMART). 2015.

42. Manning G. Self-directed learning: A key component of adult learning theory. *Journal of the Washington Institute of China Studies.* 2007;2(2).

43. Moja L, Kwag KH. Point of care information services: A platform for self-directed continuing medical education for front line decision makers. *Postgrad. Med. J.* Feb 2015;91(1072):83-91.

44.   Mehta N, Geissel K, Rhodes E, Salinas G. Comparative effectiveness in CME: Evaluation of personalized and self-directed learning models. *J. Contin. Educ. Health Prof.* Spring 2015;35 Suppl 1:S24-26.

45.   Li ST, Paterniti DA, Co JP, West DC. Successful self-directed lifelong learning in medicine: A conceptual model derived from qualitative analysis of a national survey of pediatric residents. *Acad. Med.* Jul 2010;85(7):1229-1236.

46.   Diamond L, Kues J, Sulkes D. *The Quality Improvement Education Roadmap: A Pathway to Our Future.* Alliance for Continuing Education in the Health Professions;2015.

47.   Kirby S, Marsh J, J. M, Thie H, Xia N, Sollinger J. *Developing Military Health Care Leaders Insights from the Military, Civilian, and Government Sectors.* RAND Center for Military Health Policy Research;2011.

48.   North Shore Long Island Jewish Health System. *Fostering Corporate Growth and Change Through Life Long Learning.* Northport, NY: Onward Publishing, Inc.

49.   Education and Training [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training. Accessed September 29, 2014.

50.   Wright J. Response to Congressional Defense Committees, Third Submission under Section 731 of the National Defense Authorization Act for Fiscal Year 2013, Plan for Reform of the Administration of the Military Health System. Washington, DC: Under Secretary of Defense for Personnel and Readiness; 2013.

1. INTRODUCTION

> *"The education of the doctor which goes on after he has his degree is, after all, the most important part of his education."*
>
> John Shaw Billings[51(p.75)]
> American Surgeon and Librarian

> *"For us who Nurse, our Nursing is a thing, which, unless in it we are making progress every year, every month, every week, take my word for it, we are going back."*
>
> Florence Nightingale[52(p.322)]
> Founder of Modern Nursing

As one of the Nation's largest health care systems,[1] the Department of Defense (DoD) maintains a network of health professionals who provide care for approximately 9.6 million eligible beneficiaries with a budget of $47.4 billion in Fiscal Year 2015.[2] The population served includes a diverse group of individuals across the entire age spectrum. The mission of the Military Health System (MHS) is to enhance DoD and the Nation's security by providing health care support for the full range of military operations and by sustaining the health of all those entrusted to DoD's medical care.[3] DoD health professionals are integral to accomplishing this mission by ensuring the fighting force is medically ready, by caring for them at home and on the battlefield, and by caring for their families and other eligible beneficiaries.

Health professionals need effective continuing education (CE) to maintain and advance their knowledge and skills to provide the best possible care for their patients. The unique demands of the military require health professionals to complete CE to maintain licensure and professional certification as well as military-specific medical readiness training.[‡] DoD health professionals have also contributed to advancing knowledge in medicine and health care. The military has long been a leader in medical research and innovation, with advancements often arising from battlefield experiences that eventually make their way into civilian practice.[53] DoD health professionals have communicated these advances through scientific publications and presentations at professional meetings, contributing to the body of scientific knowledge while also benefitting from the CE and professional exchanges provided at these meetings. Implementing a comprehensive and effective CE program that accomplishes all of these goals requires a significant ongoing investment. However, the current fiscal environment is forcing the MHS to search for opportunities to reduce costs and become more efficient, including within CE, while improving the quality of care and maintaining military readiness.

[‡]Medical readiness training includes "courses, hands-on training programs, and exercises designed to develop and enhance survival skills and maintain military medical skills, and addresses individual, collective and unit training, both initial and sustainment, required to ensure that healthcare personnel and units are capable of performing operational missions."[5]

According to the Office of the Under Secretary of Defense (Comptroller/Chief Financial Officer), the relative cost of health care has grown from 4 percent of DoD's base budget in 1990 to almost 10 percent in 2012.[2] The Congressional Budget Office estimates that health care costs will claim 11 percent of the DoD budget by 2028 and that "continued rapid growth in military health care costs could force DoD to reduce spending in other areas, such as force structure, military readiness, and weapons modernization."[54(p.3)] The Budget Control Act of 2011, as modified by subsequent legislation, capped DoD's funding between Fiscal Years 2014 and 2021. Thus, a serious assessment of funding priorities and an aggressive effort to identify opportunities to increase efficiency and reduce costs are ongoing. In response to these budgetary pressures and new policies restricting conference-related travel, the Defense Health Board was asked to examine the full spectrum of CE activities and provide recommendations for the appropriate balance of CE modalities that would allow the MHS to minimize travel expenditures while ensuring it continues to provide the best possible care to beneficiaries.

The American Medical Association defines continuing medical education (CME) as:

> …educational activities which serve to maintain, develop, or increase the knowledge, skills, and professional performance and relationships that a physician uses to provide services for patients, the public or the profession. The content of CME is the body of knowledge and skills generally recognized and accepted by the profession as within the basic medical sciences, the discipline of clinical medicine, and the provision of health care to the public[55(p.2)]

Similar definitions of CE are shared by several other professional organizations including the American Osteopathic Association,[56] American Psychological Association,[57] American Public Health Association,[58] American Academy of Physician Assistants,[59] American Pharmacists Association,[60] and American Nurses Association.[61] These associations and other health-focused organizations, including health care facilities, provide a variety of CE opportunities for health professionals.

Over the past 15 years, multiple publications have identified significant deficiencies in the current CE system and have advocated for specific improvements.[15,18,29,32,46,62,63] In recent efforts to reform health care, attention has focused on the effectiveness of CE in changing health care outcomes and provider behavior.[64] Additionally, "escalating health care costs and the growing gap between health care evidence and practice [has] prompted close scrutiny of health professions education as one potential solution for improving the health care delivery system."[65(p.6)] Several analyses have shown that health care quality is not necessarily correlated with cost either.[66-68] The United States has the most expensive health care system in the world but ranks last among wealthy countries in overall performance.[69]

In addition to the focus on providing cost-effective CE, changes occurring within health care practice have also had an impact on CE. One example is the concept of evidence-based medicine, which has influenced the subject matter and format of CE.[15] Evidence-based medicine refers to the "integration of best research evidence, clinical expertise, and patient values."[70(p.1)] The application of evidence-based medicine principles "promotes consistency of treatment and

optimal outcomes, helps establish national standards of patient care, and sets criteria to measure and reward performance-based medical practice."[71(p.S3)] This process also allows clinicians to identify research gaps and provide guidance to further advance health care. An important goal of providing CE in this context is to reinforce application of current standards of care while also recognizing the importance of clinical judgment and patient preference in determining the best treatment plan for an individual patient, even if it deviates from the standard.

There is also a growing emphasis by professional organizations on continuous learning that highlights quality management and patient outcomes.[64] The American Board of Medical Specialties has adopted a Maintenance of Certification program as part of an effort to move toward a system that continuously evaluates physician competence and performance. A 2010 report by the Institute of Medicine noted, "learning methods have evolved from a focus on professionals' attendance at and satisfaction with a limited set of educational activities to a focus on demonstrably changing professional practice and improving patient outcomes."[15(p.16)] In the movement toward a more patient-centered environment, there has also been a growing emphasis on the need for collaborative and integrated teams of health professionals, which have been shown to improve the efficiency and efficacy of patient care.[63] However, as suggested by the Josiah Macy, Jr. Foundation, interprofessional education "remains relatively underdeveloped and undervalued in health professions education and formal continuing education."[63(p.33)]

These new focus areas in CE illustrate a shift from the traditional emphasis on simply achieving credit hours or units to enhancing patient care practices, measuring and demonstrating competence, and improving quality and patient safety. This shift is also reflected in the recent recommendations within the *Military Health System Review: Final Report to the Secretary of Defense*. Completed in August 2014, the report includes recommendations "directed at system enhancements to address areas of concern and to drive changes that will foster creation of a high reliability health system."[14(p.1)] Such health systems emphasize "harm prevention and quality improvement," establishing a culture of quality, safety, and process improvement.[14(p.1)]

Against this backdrop of promoting systemic change in health care systems, CE for health professionals is at a transformative point. These trends, combined with new technological capabilities for learning, provide an opportunity for the MHS to be a leader in developing a more comprehensive and effective CE program, focusing simultaneously on the needs of the patient population and the health professional. In some cases, the integration of innovative and multimodal technologies, including simulation, may provide cost-effective alternatives to traditional didactic methods of CE. However, in-person participation in professional conferences has many benefits and warrants continued support in a prioritized manner. If the transition to an outcome-based approach to determining the effectiveness of CE is to be successful, institutions will need to implement systems to measure and track both completion of CE events and the outcomes of interest. Greater integration of CE, clinical, patient safety, quality, and credentialing functions may be required to fully support these efforts.

Assessing the costs of CE is complex and, as with many other large health care organizations, MHS has found it challenging to determine the current overall costs associated with providing CE. Improved cost data collection would be useful in determining the relative value of CE

initiatives and their impact on health care outcomes of interest. When identifying opportunities for DoD to reduce the costs of offering or paying for CE without adversely impacting quality or safety of care, the following domains should be considered: (1) initial investment and maintenance costs; (2) improving efficiency without adversely affecting care; and (3) assessing the downstream cost savings that may occur as a result of an effective CE program.[16,17] A component of this assessment is evaluating the impact of CE on the health care system. As stated in the 2010 joint Association of American Medical Colleges/American Association of Colleges of Nursing report, *Lifelong Learning in Medicine and Nursing,* policy makers at all levels are encouraged "to consider the importance of lifelong learning relative to its contribution to improved quality, patient safety, provider retention, cost-effectiveness, and overall impact on the health care system."[18(p23)] Furthermore, the American Nurses Credentialing Center has emphasized that "Outcome metrics, or quantifiable outcome measures, serve as a foundation for assessing the value of CNE [continuing nursing education] for improved performance, and the value of investing in CNE for the individual nurse, patients and the health care system."[19(p2)]

There are also opportunities to enhance the efficiency with which CE is administered and accessed that could provide cost savings and increased effectiveness. For example, there is redundancy among accredited CE providers within DoD. Even with these duplicate CE providers, organizations in DoD continue to contract with commercial entities for provision and tracking of CE.[72,73] In some cases this outsourcing is related to a requirement to simultaneously support CE credits for multiple professions beyond just CME and CNE. Furthermore, identifying available CE opportunities across the MHS is challenging, as there is no single web portal providing visibility of health-related CE opportunities, policies, and other relevant information. Even within individual organization websites, it can be challenging to find and access available CE offerings. There is also duplication in learning management systems for health care related CE in DoD. However, the Defense Health Agency Education and Training Directorate is working to consolidate these and has already realized cost savings from this effort.[74] Even with the multitude of entities that provide and track CE in DoD, individual health professionals are left to manually compile their CE credits from the various sources. An ideal system would have one database to track completion of all CE in an automated fashion, regardless of the source.

Thus, there are a number of areas in which DoD could improve access to and cost-effectiveness of CE. In addition, there are significant challenges ahead in implementing a system to measure outcomes of importance and respond with CE to address deficiencies. New technologies in simulation and distance learning will play a greater role in accomplishing CE goals. There are also great opportunities to contribute to research in the area of CE. This report attempts to highlight areas of significance in CE for health professionals in the MHS and provide general direction in which to proceed in building a better overall CE program.

Overarching Finding: An effective and fiscally responsible CE program should improve the performance of a complex health care system. Given DoD's extensive health care expertise, comprehensive practice environment, and worldwide delivery of care, it is uniquely positioned to be among the leaders in the development of a model CE program for health professionals.

Overarching Recommendation: In an effort to establish itself as a leader in the field of CE, DoD should implement a centralized, innovative, multimodal, cost-effective CE program that employs the latest educational and technological advancements; provides an efficient infrastructure to plan, track, and deliver CE; and uses a systems approach that integrates measures of access, quality, patient safety, medical readiness, and efficiency in assessing program effectiveness.

References

1. U.S. Government Accountability Office. *Electronic Health Records: VA and DOD Need to Support Cost and Schedule Claims, Develop Interoperability Plans, and Improve Collaboration.* Washington, DC; 2014. GAO-14-302.
2. U.S. Department of Defense. *United States Department of Defense Fiscal Year 2015 Budget Request Overview.* Washington, DC: Office of the Under Secretary of Defense (Comptroller)/ Chief Financial Officer;2014.
3. U.S. Department of Defense. *The Military Health System Strategic Plan: A Roadmap for Medical Transformation.* Washington, DC 2007.
5. U.S. Department of Defense. Medical Readiness Training. In: U.S. Department of Defense, ed. *Department of Defense Instruction 1322.24.* Washington, DC 2011.
14. U.S. Department of Defense. *Military Health System Review: Final Report to the Secretary of Defense.* Washington, DC 2014.
15. Committee on Planning a Continuing Health Professional Education Institute, Board of Health Care Services, Institute of Medicine. *Redesigning continuing education in the health professions.* Washington, DC: National Academies Press 2010.
16. U.S. Government Accountability Office. *Defense Health Care Reform: Actions Needed to Help Realize Potential Cost Savings from Medical Education and Training.* Washington, DC 2014.
17. U.S. Government Accountability Office. *Defense Health Care Reform: Actions Needed to Help Ensure Defense Health Agency Maintains Implementation Progress.* Washington, DC 2015.
18. Association of American Medical Colleges, American Association of Colleges of Nursing. Lifelong learning in medicine and nursing, final conference report. 2010; Washington, DC.
19. American Nurses Credentialing Center. *The Importance of Evaluating the Impact of Continuing Nursing Education on Outcomes: Professional Nursing Practice and Patient Care.* 2014. http://www.nursecredentialing.org/Accreditation/ResourcesServices/Evaluating-the-Impact-CNE-Outcomes.pdf. Accessed June 12, 2015.
29. Continuing education in the health professions: Improving healthcare through lifelong learning, proceedings of a conference sponsored by the Josiah Macy, Jr. Foundation. 2007; New York, New York.
32. Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: Effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):69s-75s.
46. Diamond L, Kues J, Sulkes D. *The Quality Improvement Education Roadmap: A Pathway to Our Future.* Alliance for Continuing Education in the Health Professions;2015.
51. Logan JI. *Medicine in Quotations: Views of Health and Disease Through the Ages.* Second ed. Philadelphia, PA: American College of Physicians; 2006.
52. Melnyk BM, Fineout-Overholt E, eds. *Evidence-based Practice in Nursing & Healthcare: a Guide to Best Practice.* Lippincott Williams & Watkins; 2011.
53. Grasser K. Military medicine: a history of innovation. *Phoenix Patriot.* 2012.

54. Congressional Budget Office. *Approaches to Reducing Federal Spending on Military Health Care.* Washington, DC: Congress of the United States;2014.

55. American Medical Association. *The Physician's Recognition Award and Credit System.* American Medical Association;2010.

56. American Osteopathic Association. Continuing medical education [Web page]. 2014; http://www.osteopathic.org/inside-aoa/development/continuing-medical-education/Pages/default.aspx. Accessed May 29, 2014.

57. American Psychological Association. Office of continuing education in psychology [Web page]. 2014; http://www.apa.org/ed/ce/index.aspx. Accessed May 29, 2014.

58. American Public Health Association. Continuing education at the APHA annual meeting [Web page]. 2014; http://www.apha.org/professional-development/continuing-education/continuing-education-at-the-annual-meeting. Accessed May 29, 2014.

59. American Academy of Physician Assistants. New NCCPA certification maintenance requirements [Web page]. http://www.aapa.org/threecolumnlanding.aspx?id=1298. Accessed May 29, 2014.

60. American Pharmacists Association. Learn [Web page]. 2014; http://www.pharmacist.com/node/26541. Accessed May 29, 2014.

61. American Nurses Association. About us [Web page]. 2011; http://ananursece.healthstream.com/pages/about.aspx. Accessed May 29, 2014.

62. Committee on Quality Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century.* Washington, DC: National Academies Press;2001.

63. Committee on the Health Professions Education Summit. *Health Professions Education: A Bridge to Quality.* Washington, DC: National Academies Press;2003.

64. American Association of Colleges of Nursing and the Association of American Medical Colleges. *Lifelong Learning in Medicine and Nursing: Final Conference Report.* Washington, DC: American Association of Colleges of Nursing;2010.

65. Continuing education, professional development, and lifelong learning for the 21st century health care workforce. *11th Annual Report to the Secretary of Health and Human Services and the U.S. Congress*: Advisory Committee on Interdisciplinary Community-Based Linkages; 2011.

66. Jha AK, Orav EJ, Epstein AM. Low-quality, high-cost hospitals, mainly in south, care for sharply higher shares of elderly black, hispanic, and medicaid patients. *Health Aff. (Millwood).* 2011;30(10):1904-1911.

67. Chen LM, Jha AK, Guterman S, Ridgway AB, Orav E, Epstein AM. Hospital cost of care, quality of care, and readmission rates: penny wise and pound foolish? *Arch. Intern. Med.* 2010;170(4):340-346.

68. Hussey PS, Wertheimer S, Mehrotra A. The association between health care quality and cost: a systematic review. *Ann. Intern. Med.* 2013;158(1):27-34.

69. Davis K, Stremikis K, Squires D, Schoen C. *Mirror, Mirror on the Wall, 2014 Update: How the U.S. Health Care System Compares Internationally.* The Commonwealth Fund; June 2014.

70. Sackett DL. *Evidence-based Medicine: How to Practice and Teach EBM.* Churchill Livingstone; 2000.

71. Lewis SJ, Orland BI. The importance and impact of evidence-based medicine. *JMCP.* 2004;10(5):S3-S5.

72. Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. Monthly webinars [Web page]. 2015; http://www.dcoe.mil/Training/Monthly_Webinars.aspx. Accessed July 29, 2015.

73. Continuing education update: announcing new CE provider for patient safety training activities [Web page]. 2015; http://health.mil/News/Articles/2015/04/23/Continuing-Education-Update-Announcing-New-CE-Provider-for-Patient-Safety-Training-Activities. Accessed August 4, 2015.

74. Robb D. *Defense Health Agency Update.* [PowerPoint]. Falls Church, VA;2015.

2. CONTINUING EDUCATION REQUIREMENTS AND POLICIES FOR HEALTH PROFESSIONALS

"So what is '[Continuing Medical Education]'? It's a strategic and tactical asset tied intimately into mission."   Todd Dorman[75]
                                                                       Associate Dean & Director
                                                                       Continuing Medical Education
                                                                       Johns Hopkins University

Continuing education (CE) requirements for health professionals are determined in part by the requirements for professional licensure and certification. State boards throughout the United States follow their own established criteria to manage licensing of health professionals, and the CE requirements to renew a license vary by State and profession.[23] Professional organizations and boards have additional CE requirements for maintaining certification in specific health specialties,[15] including for health professions who may not fall under a State license, such as a public health professional.[76] In fields that are governed by licensing authorities, both civilian and military health professionals are required to hold a current State license in order to practice within U.S. military facilities.[15]

Funding for development and presentation of CE activities is provided by government agencies, individual professionals, schools, professional societies, education companies, private industry, and the health care delivery system.[15] These CE events and materials can be costly to distribute and maintain, and individual accreditation bodies, such as the Accreditation Council for Continuing Medical Education (ACCME), must accredit these activities. The primary sources of these CE activities vary by profession. Within medicine, medical schools provide 45 percent of CE credit hours for physicians,[15] while approximately a quarter of the credit hours are provided by professional societies and organizations, employers of health professionals, and commercial organizations.[15] Government or military CE providers represent a small percentage of directly sponsored medical CE credit hours, providing approximately six percent of continuing medical education credits in 2014, according to data provided by the ACCME.[77]

Payment for CE activities may come from a variety of sources,[15] but most commonly comes from the individuals themselves or the professional's employer, as it is in the best interest of each health care facility to maintain the skills of its personnel. In the civilian setting, some employers, schools, or professional organizations provide stipends to use toward achieving CE.[15,78-80] However, financing of CE also differs by profession. Though some organizations "see continuing education as an investment in staff development and bear a portion of [continuing education] costs,"[15(p.69)] others expect individual professionals to pay for the majority of continuing education themselves.[15]

2.1 CIVILIAN HEALTH PROFESSIONAL REQUIREMENTS

Application or renewal fees typically are required to obtain or maintain health professional licenses in the United States. Each State board that licenses health professionals sets its own requirements for licensure or renewal, and these can vary significantly.[24-26] Typically, applying for first-time licensure requires significant testing and documentation of education and training.

Once granted, licensure must be renewed every 2 to 3 years to continue to practice, depending on the particular State board's requirements.[81]

Requirements for license renewal often include completing a minimum number of CE credit hours for each renewal period. For physicians this minimum ranges from 0 to 100 hours approximately every 2 years.[23] Additional requirements for license renewal vary and may include submission of information about practice history, a record of prescribing controlled substances,[82] information about the provider's medical practice,[82] and financial interest statements.[83] Some States and professions may require CE on specific subjects such as end-of-life care, ethics, domestic violence, or human immunodeficiency virus/acquired immunodeficiency syndrome.[23]

Licensure requirements are dynamic in nature, with modules and specifications often being added or changed as the result of public health or societal concerns. For example, beginning in 2015, registered nurses licensed in Florida are required to complete two hours of CE on the laws and rules that govern the practice of nursing in Florida.[84] Similarly, as of 2015, the State of California has asked that its Medical Board consider requiring a CE course on geriatric care for emergency room physicians and surgeons.[85] The increasing number and changing nature of these CE requirements present additional challenges for health professionals to meet licensing requirements.

For nurses, the minimum required CE ranges from 0 to 30 hours approximately every 2 years. However, the type of CE hours required may vary depending on the type of nursing license. For example, to renew a nursing license in New Mexico, certified nurse practitioners and clinical nurse specialists are required to complete either 50 hours of CE every 2 years or maintain a national certification.[86] Similarly, for psychologists, the minimum CE required for a license renewal ranges from 0 to 60 hours over the course of approximately 2 years. As with nursing licenses, CE hour requirements for maintaining a license vary by State and specific type of license. For example, in Iowa 40 hours of CE are required over the course of 2 years for a licensed psychologist, but for a "Health Service Provider in Psychology" no CE is required.[87]

Similar to health care licensure, specific CE requirements for maintaining certifications vary by field and specialty. For example, the American Board of Allergy and Immunology requires completion of 25 CE credits each year, a patient safety module once every 10 years, and a recent advances module every 5 years.[88]

2.2 MILITARY HEALTH PROFESSIONAL REQUIREMENTS

As previously described, the Military Health System (MHS) mission is to maintain a healthy military force as well as a cadre of health professionals who are trained to provide quality medical care for our Nation's warriors and their families. To support readiness across the spectrum of military activities, military health professionals are required to maintain their professional licenses and continuously meet, at a minimum, Department of Defense's (DoD's) medical readiness training requirements listed in Table 1. Additionally, they must complete the medical readiness training requirements of their specific Military Department (Army, Navy, Air Force).

Table 1. Medical Readiness Training Criteria for military medical personnel from Department of Defense Instruction 1322.24[5]

MEDICAL READINESS TRAINING CRITERIA. Units shall document completion of initial and sustainment medical readiness training in individual training records. Minimum medical readiness training requirements are:
a. Initial Medical Readiness Training. Medical personnel shall complete Service-required initial medical readiness training.
b. Sustainment Medical Readiness Training. This training shall focus on continuing individual development, maintaining Service-required medical readiness training, and emphasize collective and unit training.
(1) All military medical personnel shall train to maintain proficiency in individual medical readiness skills.
(2) All medical personnel assigned to or deploying with a medical operational platform will be familiarized on:
(a) Threats and potential battlefield environments.
(b) Operational concepts of operation.
(c) Operational command, control, and communications.
(d) Preventive medicine, including field sanitation and hygiene.
(e) Occupational and environmental hazard recognition, mitigation, and reporting.
(f) Combat stress control.
(g) Identification and treatment of endemic infectious diseases.
(h) Identification and treatment of traumatic injuries.
(i) Aeromedical evacuation, patient and patient movement item staging.
(j) Medical support of stability operations, humanitarian assistance activities, homeland defense and defense support of civil authorities.
(k) Recognition and medical management of chemical, biological, radiological, nuclear, and explosive injuries.
(3) Participate in realistic individual, collective, and unit medical readiness training, including joint and combined exercises or deployment.
c. Minimum Training Requirements. Minimum training requirements for joint task force (JTF) and joint force commander (JFC) component headquarters staff are:

MEDICAL READINESS TRAINING CRITERIA. Units shall document completion of initial and sustainment medical readiness training in individual training records. Minimum medical readiness training requirements are:
(1) **Initial Headquarters Mission Support Training.** Training (or certification) is required for individuals to direct or work on a JTF or JFC Surgeon staff, or Service component or special operations forces headquarters surgeon staff. Training shall include:
(a) Command relationships.
(b) Command, control, and communication processes.
(c) Joint planning and execution.
(d) Medical intelligence.
(e) Service, joint, and combined operations.
(f) Health service support doctrine.
(g) Medical support to detainee operations.
(h) Military medical support to stability operations and humanitarian relief.
(i) Role specific subject matter expertise skills (i.e., blood management, medical logistics, medical regulating, public health emergency management).
(2) **Headquarters Mission Support Sustainment Training.** Individuals are required to remain certified to direct or work on a JTF surgeon staff or Service component headquarters surgeon staff.

From U.S. Department of Defense, 2011.

Because military members relocate regularly, it can be difficult for individual health professionals to maintain licensure in every State in which they are stationed.[§] To circumvent this issue, DoD requires all health care providers to "have at least one current, valid, unrestricted license from a State, the District of Columbia, or a Commonwealth, territory, or possession of the United States."[89(p.22)] Collectively, military health professionals must meet a wide range of CE requirements to maintain licensure depending on their profession and State of licensure.

Financial support for CE within DoD varies depending on annual budgets and Military Department policies. The current fiscal environment has had a major impact on the ability of the Military Departments to fund CE and related activities, with all three indicating that budgets for centrally funded CE have been significantly cut or eliminated. Additionally, because of increased restrictions and administrative requirements to obtain approval for conference attendance and hosting of conferences, conference-related requests must be submitted at least 90 days in advance of the meeting, depending on the cost.[90] DoD policy, outlined by the Deputy Chief Management Officer (DCMO) in 2013, established three tiers for reviewing and approving conference spending requests.[10] The total cost of the conference and whether it is DoD-sponsored or non-DoD-sponsored determines the review and approval tier. For example, a non-

---

[§] The Secretary of Defense maintains the authority to waive licensure requirements in unusual circumstances. This authority and responsibility has been designated to the Assistant Secretary of Defense for Health Affairs.[89]

DoD-sponsored conference with total registration costs for attendees of over $100,000 must be reviewed and approved by the Secretary or Under Secretary of the particular Military Department (Army, Navy, Air Force). Table 2 outlines the level of approval authority required for each Military Department based on the host organization and overall costs of the conference, as outlined by the DCMO in 2013.[**]

A study released in March 2015 by the U.S. Government Accountability Office (GAO) noted that apart from the DoD-wide policy on conference attendance, each Military Department has issued and updated conference spending and oversight policies that are consistent with DoD's policy. However, GAO found variance in the approaches to the delegation of approval authority among the Military Departments.[12] Additionally, the tiered review and approval structure created by the DCMO exceeds the requirements set by the Office of Management and Budget (OMB) in May 2012. For example, DoD's policy establishes senior levels of review and approval for conferences where attendee costs exceed $100,000, although the OMB's 2012 memorandum does not have such requirements.[12]

[**] New DoD conference guidance was published by the Deputy Secretary of Defense September 23, 2015, after this report's findings and recommendations were publically deliberated on August 20, 2015.[27] The new guidance sets forth three major changes: (1) delegation of waiver of approval authority for conferences is simplified into three categories, including delegation to levels consistent with law and OMB guidance, and also encourages pre-approval of recurring conferences; (2) tracking of attendance at non-DoD conferences in advance is eliminated except when it is expected that the conference will cost more than $100,000, and approval authority for attendance at such conferences is delegated to the lowest appropriate level; and (3) reporting through the DoD conference tool is limited to legally directed requirements for public reporting and reporting to Component Inspectors General.[27]

Table 2: DoD-Sponsored and non-DoD-Sponsored Conference Approval Authorities, by Military Department[12]

DoD Review and Approval Authority	Service		
	Army	**Navy**	**Air Force**
Tier 1: >$500,000 for DoD-sponsored conferences; >$100,000 for non-DoD-sponsored conferences	Secretary of the Army / Under Secretary of the Army	Secretary of the Navy / Under Secretary of the Navy	Secretary of the Air Force / Under Secretary of the Air Force
Tier 2: $100,000-$500,000 for DoD-sponsored conferences; $20,000-$100,000 for non-DoD-sponsored conferences	Chief of Staff of the Army Vice Chief of Staff of the Army Commander, U.S. Army Forces Command Commander, U.S. Army Training and Doctrine Command Commander, U.S. Army Materiel Command Administrative Assistant to the Secretary of the Army	Chief of Naval Operations Commandant of the Marine Corps Department of the Navy / Assistant for Administration Director, Navy Staff Director, Marine Corps Staff / Staff Director, Headquarters Marine Corps	Administrative Assistant to the Secretary of the Air Force Air Force Surgeon General Commanders / Vice Commanders of Major Commands Superintendent, U.S. Air Force Academy Commander, Air Force Research Lab
Tier 3: <$100,000 for DoD-sponsored conferences; < $20,000 for non-DoD-sponsored conferences	General Officers Flag Officers Senior Executive Service members	General Officers Flag Officers Senior Executive Service members	General Officers Flag Officers Senior Executive Service members

From GAO, 2015.

From both perception and quality of care perspectives, it is in the best interest of an organization to employ health professionals who achieve and maintain certification in their respective specialties. Attending professional conferences contributes to meeting CE requirements for licensure as well as certification for many professions. The long application approval process may prevent some military health professionals from participating in and being invited to professional conferences[91] and has created challenges for professionals needing to stay abreast of the state of science and clinical practice. The 2015 GAO study also notes, "approval decisions are often not made until close to the start of a conference, which creates a disincentive for the departments' scientists and engineers to take on active roles, such as presenting research or serving as a keynote speaker, and may lead to increased registration or travel costs."[12]

Following introduction of the new conference approval processes, the number of DoD-hosted conferences exceeding $100,000 of all types fell from 295 in Fiscal Year (FY) 2012 to 80 in FY 2013. The average cost per conference also fell from $300,000 in FY 2012 to $250,000 in FY 2013 and total costs fell from $89 million to $20 million.[92] The number of conferences exceeding $100,000 increased slightly in FY 2014 to 95 with an average conference cost of $261,000 and total costs of $25 million. The number of large DoD-hosted health-related conferences also decreased. In FY 2012, there were more than 20[††] health-related conferences exceeding $100,000 in costs. In FY 2013 and FY 2014, there were less than 10 DoD-hosted health-related conferences held each year exceeding $100,000. Thus, total expenditures and per conference costs for DoD-hosted conferences have decreased since the new approval processes were implemented.

With the current restrictions on conference attendance, some DoD health professionals have chosen to use personal leave to attend conferences at their own expense.[93] The longer these restrictions remain in place, the more likely they will have an adverse impact on recruitment, morale, and retention of well-qualified health professionals, especially if better financial support is available in the civilian sector. As previously noted, some civilian organizations provide stipends for health professionals to complete their CE requirements. The Department of Veterans Affairs (VA) recommends the use of Individual Learning Accounts, similar to a stipend, that include a base amount of resources expressed in dollars or hours that could be used for an employee's learning and professional development. A fixed CE stipend may offset personal expenses and allow health professionals to choose and plan their own CE experiences.

Each Military Department has an entity accredited to provide continuing medical education (CME) and continuing nursing education (CNE) at a minimum, and maintains separate offices for the administration of these activities. The U.S. Army Medical Education Directorate oversees the Army's medical education programs and is the "central point of contact/representatives on medical education issues for DoD agencies and numerous national medical organizations."[94] The U.S. Army Nurse Corps Education Branch is the American Nurses Credentialing Center (ANCC) accredited approver for CNE activities for all registered nurses of the Army Nurse Corps.[95] The U.S. Navy Medicine Professional Development Center (NMPDC) CME department provides CME for physicians and sponsors activities to improve

---

[††] Health-related conferences may include medical, nursing, psychological, and dental conferences.

competencies, performance, and patient outcomes.[96] The Office of CME at NMPDC is the central administrator for the CME Program, sponsoring educational activities worldwide.[96] The NMPDC also serves as the Navy's ANCC accredited approver for CNE. The NMPDC's CNE program provides professional training opportunities for both civilian and military nurses at Navy and Joint DoD health care facilities.[97] The CME and CNE providers for the Air Force Medical Service are co-located in the Air Force Personnel Center, with the CME program managed within the Physician Education Branch and the CNE program managed in the Nurse Education and Utilization Branch.[98]

The Army and Air Force currently use the Medical Operational Data System (MODS) to request, approve, and track CME and CNE, while the Navy only uses MODS for CME. However, to track CME/CNE completed on the primary learning management system (LMS) for the MHS, Joint Knowledge Online (JKO), the trainee must obtain a completion certificate and then manually request an update to MODS. Overall, the number of CME activities sponsored by the Military Departments and the total number of participants has increased from FY 2010 to FY 2014 (Table 3). However, this table does not indicate the total number of physicians, nurses, and other DoD health professionals requiring CE annually.

Table 3. Summary of Military Department CME Activities, FY10-FY14 and CE Policies

		FY10	FY11	FY12	FY13	FY14	Accredited as CME Sponsor by ACCME?	Pay/Reimburse Board Certification/Recertification?	Central Funding for CE Conference Attendance
Army	Total # of Activities	305	340	396	416	530		Yes - Locally, as funding allows. Requires 1 year of active duty remaining after completion for reimbursement	Currently, central funding is not available; local funding only with conference approval
	Hours of Instruction	7636	8443.25	8004	8904	10555			
	Physician Interactions	28800	29202	28517	45517	42324			
	Other Learner Interactions	12685	14796	17019	23544	22618			
Navy	Total # of Activities	102	98	94	136	265	Yes	Yes - Specialty board and MOC centrally funded by Navy Medicine Professional Development Center. Requires 1 year of active duty remaining from the date of the Board Certification Examination to qualify for funding.	Yes - Centrally funded for physicians assigned to operational billets. CME conferences must be approved by higher authority.
	Hours of Instruction	1190	971	1631	3229	7307			
	Physician Interactions	10815	11750	9868	12010	16132			
	Other Learner Interactions	8169	9062	8618	6558	9883			
Air Force	Total # of Activities	N/A	250	302	346	347		Yes - Locally, as funding allows. Requires a minimum of 2 years of active duty remaining after completing the examination or MOC activities to qualify for reimbursement	Currently, central funding is not available; local funding only with conference approval
	Hours of Instruction	N/A	6209	7096	6561	6021			
	Physician Interactions	N/A	4443	6038	6139	7462			
	Other Learner Interactions	N/A	7459	8203	6280	10330			

Adapted from data provided by the U.S. Army Medical Education Directorate, U.S. Navy NMPDC, U.S. Air Force Physician Education Branch, 2015.

Note: As of 2014, the ACCME refers to participant numbers as "interactions," which are aggregate numbers of interactions and not the number of unique participants. Therefore, participants attending multiple activities are counted multiple times.[77]

There is also variation in administrative practices and policies among the Military Departments. In the increasingly Joint environment, such differences may create tension among Service members. For example, while the Army and Air Force central CME offices do not fund/reimburse Maintenance of Certification (MOC) exams, local organizations may do so, if funding is available.[20-22] The Navy provides central funding for both initial certification and MOC.[21] Additionally, the Air Force requires that officers must have a minimum of 2 years of active duty remaining after completing the examination or MOC activities to qualify for reimbursement, while the Army and Navy only require 1 year of active duty remaining after completion (Table 3).[20,21]

Health profession licensure is one aspect of military readiness. Currently, licensure fees are a responsibility of the military health professional officer. Per 10 United States Code §2015, DoD is not authorized to pay expenses for Armed Forces members to obtain professional credentials if the professional credentials are a prerequisite for appointment.[99] In addition to State licensure,

health professionals must meet a variety of requirements in order to be credentialed at a military treatment facility (MTF). According to DoD Instruction (DoDI) 6025.13 "Medical Quality Assurance (MQA) and Clinical Quality Management in the Military Health System (MHS)," individual health professional credentials and qualifications should be evaluated before any involvement in patient care occurs.[89] These credentials are managed within the Centralized Credentials Quality Assurance System, which is a database that collects, tracks, and reports health professional data.[89] Credentials are required to be collected and verified using primary source verification[‡‡] before employment, selection, or contracting of health care providers.[89] Specific primary source criteria included in the credentialing process are described in DoDI 6025.13 and include requirements consistent with those used in civilian health care practice.[89(p30)]

As previously discussed in Section 2.1, license renewal for health professionals involves meeting a range of CE requirements. At present, offices within the medical departments of the Army, Navy, and Air Force are accredited CE providers. Each accredited CME provider is required to periodically apply for and renew this accreditation with the Accreditation Council for Continuing Medical Education and pay associated fees. A similar process is required to maintain accreditation to sponsor CE for other professions as well. Additionally, each office must maintain a staff to review and approve CE activities, keep appropriate records, and provide other administrative support. Even though each Military Department has accredited providers for CME and CNE, a number of MHS organizations (e.g., Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE), DoD Patient Safety Program) contract with non-DoD entities to accredit their CE offerings. The rationale for this is the need to obtain CE credit for multiple health professions from a single source, beyond just CME and CNE.

In 2013, DoD outlined the shared services scope of responsibilities for the new Defense Health Agency (DHA) Education and Training Directorate.[50] These functions include establishing an enterprise-wide eLearning tool, consolidating and streamlining administrative and oversight functions, coordinating professional development and sustainment programs, and facilitating centralized training review.[49] The plan for reform of the administration of the MHS also states responsibilities of the Directorate will be to "oversee and manage administrative and support activities…to include continuing education credit granting, [and] conference approval package development."[50(p.22)] The DHA Education and Training Directorate is currently working to consolidate LMSs used by the MHS, with JKO selected as the primary CE delivery platform, and anticipates significant cost savings from this consolidation. However, JKO does not communicate with MODS, the platform used for administration and tracking of CE credits, and MODS currently only administers CME and CNE.

If the MHS could adopt a single platform to plan, administer, deliver, and track health-related CE activities of all types, additional cost savings could be achieved while reducing the end user's time in accessing and monitoring his or her own CE progress. Consolidation would also provide leadership with better visibility of staff completion of CE. In addition, if DoD were able to work with medical specialty boards and State licensing authorities to bidirectionally share CE

[‡‡] Primary source verification is the verification of credentials obtained by the issuing organization, such as a State health care licensing board.[100]

information, this would allow even greater efficiency in tracking CE status and further reduce the administrative burden on individual health professionals. A central office dedicated to CE, with the functions outlined above, could coordinate and promote the efficient and effective accomplishment of CE goals. These goals include the creation of consistent policies and procedures for CE. This would require significant cooperation among the DHA, the Uniformed Services University of the Health Sciences (USUHS), and the Military Departments, through which appropriate support functions would be consolidated within the DHA while not infringing on the role of the Military Departments in training and equipping their forces.

Finding 1 – Conference Approval Processes: Current DoD policy has resulted in significant administrative overhead and long approval times for health professionals who request to participate in CE conferences. These delays have prevented military health professionals from participating in and, in some cases, being invited to present at these conferences.

> **Recommendation 1: DoD should establish a CE budget and delegate approval authority to the military treatment facility Commander level or equivalent to create a timely, streamlined approval process for military health professionals to participate in CE conferences.**

Finding 2 – Differences among Military Departments and the DHA: There are differences among the Military Departments and the DHA in administrative and funding practices, procedures, and policies for CE and (re)certification activities. Given the increase in joint manning at military treatment facilities, these disparities may affect the morale and retention of military health professionals. In addition, having multiple administrative processes for approval of CE or certification activities introduces inefficiencies.

> **Recommendation 2.1: DoD should implement policies to specify consistent processes and equitable funding opportunities for CE and (re)certification for health professionals across the MHS.**

> **Recommendation 2.2: DoD should provide a common, web-based application to submit requests for approval to host or participate in all CE activities, including participation in non-DoD sponsored professional conferences. Expanding the capability of MODS to include these functions and cover all health professions with accredited CE would be one option to accomplish this.**

Finding 3 – Consolidation of DoD CE Providers and Learning Management Systems: **DoD currently has multiple entities accredited as CE providers and is not using a common system to plan, provide, and track CE, which results in duplication of expenditures.**

> **Recommendation 3: In coordination with the Uniformed Services University of the Health Sciences and the Military Departments, DoD should establish a central office of continuing education for health professionals under the Defense Health Agency Education and Training Directorate. This office should:**
> a. **Serve as the consolidated accredited continuing education administrator for DoD.**
> b. **Continue to develop and maintain a single learning management system delivery platform with planning and bi-directional tracking capabilities to support the Military Departments in managing continuing education for health professionals while reducing the administrative burden to the individual and the system.**

2.3 THE FULL SPECTRUM OF CONTINUING EDUCATION OPTIONS

Health professionals have a variety of opportunities to achieve required CE credit hours, ranging from personal study, reading or reviewing journal articles, taking examinations, teaching, and attending/presenting at national professional meetings.[15,55] With the advent of advanced technologies, this spectrum has expanded to include computer-based simulations and online activities.

CE has traditionally been achieved by attending lectures and meetings or conferences.[15,29] Professional organizations and associations, such as the American Public Health Association[101] and the American Dental Association,[102] often host annual meetings where health professionals can achieve CE hours relevant to their areas of practice. As published in the 2014 ACCME annual report, almost half of the activities accredited by the ACCME providers were defined as "courses," including annual meetings, conferences, and seminars.[77]

Several military-specific conferences and meetings exist to address the unique aspects of military health. The Military Health System Research Symposium provides a cooperative environment for health professionals from across DoD, academia, and commercial organizations to meet and share ideas in addition to achieving CE.[103] Additionally, the Association of Military Surgeons of the United States, which is also known as the Society of Federal Health Professionals (an organization dedicated to "all aspects of federal medicine"), typically holds annual meetings and provides access to members from "all health care disciplines" including active duty and Reserve Component, DoD, and VA personnel.[104] These are examples of dedicated military conferences and organizations that provide a focus on the unique aspects of military health while providing CE for DoD health professionals. A number of other health-related associations also have military interest groups and include sessions on military-specific topics at their annual meetings. These meetings and conferences provide CE and bring together military and civilian health professionals, promoting communication and collaboration between the two communities.

Grand rounds,[§§] often held at larger MTFs, also provide an important source of CE. These lecture style activities are typically approved for CE and provide an opportunity for interprofessional discussion and collaboration.

Modalities for CE beyond in-person meetings and conferences are evolving with advances in simulation and communication technologies. Simulation can be broadly defined as "any system that replicates real-world processes, actions, or behaviors."[107(p.255)] Simulation centers, such as the Val G. Hemming Simulation Center at USUHS are utilized by DoD to provide medical training to its health professionals.[108] Simulation-based medical education offers "safe and effective opportunities for learners at all levels to practice and acquire clinical skills needed for patient care."[109(p.62S)]

Distance learning options, including online meetings, webinars, and web-based simulations, are also growing increasingly popular.[29,110] Internet-based CE, including webinars and video-teleconferences, provide a source of CE for those DoD health professionals and others unable to travel. Such Internet-based platforms provide a more cost-effective option for health professionals, eliminating the time and cost associated with travel to offsite locations, conference space, refreshments, and meeting materials. A number of organizations within DoD provide distance learning options for DoD health professionals. The Joint Medical Executive Skills Institute[111] and DCoE[112] are both examples of DoD organizations with considerable Internet-enduring materials (i.e., posted and available on the Internet) and webinars available for CE. Additionally, the Navy CE program is currently working to expand its use of grand rounds by videotaping these lectures for use in webinars for remote personnel. Professionals within certain specialties, however, may not be able to meet all their CE requirements through these types of events. For example, active members of the American Academy of Family Physicians (AAFP) are required to complete 150 CME credits over three years, including at least 75 AAFP prescribed credits and 25 credits from live activities.[113]

At the time of this report, the MHS was using a number of LMSs to support courses and content for education and training opportunities, such as TRICARE University Immunization University and Project Immune Readiness.[28] However, these and other CE opportunities are scattered across numerous military, federal, and contractor websites, making locating and accessing them inefficient. The DHA Education and Training Directorate has undertaken the task of consolidating the MHS's learning management systems into a single enterprise-wide system that would provide a single access point for users.[28] JKO has been selected as the common platform.

Mixed modalities of in-person and distance learning are also available, with preparatory work or information distributed via the Internet followed by attendance at a meeting or conference. This format, referred to as a "flipped classroom," provides the opportunity for health professionals to use in-person meetings more efficiently, by reviewing relevant content in advance. For example, in June 2014, the ANCC held its first flipped classroom event with the 2014 ANCC Annual Symposium on Continuing Nursing Education. Attendees were given the option to participate in 11 interactive video lessons that provided six CE credits in advance of the symposium.[114]

[§§] Grand rounds are regularly scheduled presentations to physicians, nurses, and other health professionals that may include discussions of clinical cases and the latest advances in the field of medicine and health care.[105,106]

Organizers believed that the technology should allow attendees to "digest didactic content in advance and use classroom time to apply what they learned, analyze scenarios, and solve problems. In addition to learning at their pace, attendees can pose questions to symposium faculty and collaborate with fellow learners ahead of the live event."[115] The aim of integrating such technology into the symposium was to allow faculty to "more readily focus symposium time on the specific needs of learners rather than a fixed curriculum."[115]

More recently, Massive Open Online Courses (MOOCs) have been developed. These provide highly scalable forms of online learning and offer opportunities for blended learning to enrich on-campus teaching using the "flipped classroom" model.[116] MOOC organizations such as MIT OpenCourseWare, Khan Academy, Coursera, and NovoEd, provide free educational resources to any interested participant. Although the impact of MOOCs on participants' knowledge and skills acquisition requires further research, this technology represents an opportunity to provide adaptive online CE for health professionals.[117]

DoD also has internationally recognized expertise in medical topics of operational significance, such as aerospace, environmental, and undersea medicine that may also have civilian applications. There are currently limited online courses available on these topics. Thus, opportunities exist for DoD to create online CE to fill specific needs in these and other areas, thus providing an additional venue for health professionals to improve military readiness. Providing a mechanism to facilitate this process, such as an online course development template, would allow subject matter experts within DoD to collaborate in rapidly developing new CE content for peer review and distribution.

It is essential that CE activities provide valuable experiences that engage the health professional and truly maintain and advance his/her skills and knowledge. Not every form of CE activity is equally effective in accomplishing these goals. Simply attending a lecture or watching a PowerPoint presentation may or may not be rigorous enough to achieve a specific learning objective. Thus, with the wide variety of methods available to complete CE credits, it is important that health professionals and CE providers select those shown to be most effective for specific learning objectives.

Finding 4 – CE Resources: There are currently a wide variety of CE resources and reference materials available to DoD health professionals. However, finding these resources can be challenging, as there is no dedicated CE web portal to provide a single, organized access point to this information.

> **Recommendation 4: DoD should create and maintain a dedicated CE web portal to provide a single gateway to all CE resources available to DoD health professionals, including links to appropriate resources outside of DoD.**

Finding 5 – Unique DoD Medical Expertise: There is a wealth of unique operational expertise within the MHS on topics of medical significance with potential civilian applications. DoD could improve access to essential medical readiness education and training for military and civilian health professionals by creating online CE offerings on

key topics such as aerospace, environmental, and undersea medicine in addition to expanding availability of other medical readiness topics.

> **Recommendation 5: DoD should leverage its medical expertise by developing unique CE opportunities to enhance military readiness and share expertise broadly with civilian health professionals.**

2.4 CONTINUING EDUCATION OUTCOMES AND EFFECTIVENESS

> *"We can no longer afford continuing medical education that operates independently of other healthcare professionals, patients, and quality improvement efforts. Bringing 'quality improvement' and 'continuing medical education' together is our 'Eureka' moment in health care."*
>
> The Alliance for Continuing Education in the Health Professions[118]

The primary intent of CE is to provide better care to patients by increasing and maintaining the competency of health professionals. CE needs and delivery methods may differ based on specialty, health care function, and educational goals. There are many approaches to providing CE, each with varying effectiveness in changing health professional behavior and achieving desired patient outcomes. These outcomes can be difficult to measure and may be even more challenging to attribute to CE. Several studies have examined the ability of CE methods to educate health professionals and to affect their clinical practice. A 2007 Agency for Healthcare Research and Quality (AHRQ) report reviewed studies on the effectiveness of a wide variety of techniques, media, and exposures used for CME. The report concludes that "CME appears to be generally effective not only in the acquisition or achievement of knowledge, attitudes, skills, behaviors, and clinical practice outcomes, but also in their retention, and there are certain techniques, methods or exposures which seemed to be better than others."[119(p.59)] The relative effectiveness of various CE activities is described below.

In-Person CE
As described in previous sections, in-person lectures, courses, or professional meetings are the most traditional methods used to deliver CE. One review of CE in the health professions notes that although lectures play an important role in distributing new information, they may not be considered "good education," suggesting that they be improved with increased interaction, case discussions, and breakout groups.[29] To this point, a 2009 Cochrane review by Forsetlund et al concluded the overall effect of traditionally didactic educational meetings "tended to be small but varied between studies and the effect on patient outcomes was generally less."[120(p.2)] However, the authors concluded that "educational meetings alone or combined with other interventions can improve professional practice and the achievement of treatment goals by patients."[120(p.2)]

A similar conclusion regarding didactic methods was reached in another review of formal CE activities by Davis et al.[121] The authors also noted that interactive and mixed format CE activities were more effective than traditional didactic methods, and the latter failed to achieve substantial changes in performance or health care outcomes.[121] Additionally, they found that

sequenced CE activities have a larger impact than single events, providing more opportunities for interaction and exposure to new materials.[121] The authors note, "the learn-work-learn opportunities afforded by sequenced sessions, in which education may be translated into practice and reinforced (or discussed) at a further session, may explain the success of sequenced interventions."[121(p.871)] The authors also comment that interactions that take place among professionals during CE events may influence their learning and subsequent changes in practice.[121] Audience response systems, such as clickers or mobile applications, are active learning tools that allow for the collection, viewing, and discussion of feedback during or directly following a course or lecture session. These systems may improve learning outcomes and facilitate long-term retention of material as a result of their use during conferences and courses.[122]

Simulation Education
As previously noted, simulation-based medical education may provide safe and effective education and training opportunities for health professionals at all levels. Simulation may use different modalities, including standardized patients; part-task physical trainers; virtual reality and visualization; desktop simulation and virtual worlds; and mannequin-based simulation.[123] Simulation technology, although widely used for undergraduate and graduate medical education, is still an area of growth opportunity for CME.[109,107]

Simulation-based medical education has been linked to improved patient care practices, including improvement in management of difficult obstetrical deliveries, laparoscopic surgery, and bronchoscopy. Furthermore, simulation has been linked directly to improved patient outcomes, such as reduced catheter-related bloodstream infections and better postpartum outcomes among newborn infants.[124] Although research indicates that simulation-based medical education is an effective instructional technique,[125,126] comparing its effectiveness with other CE approaches is challenging, given the variation in simulation interventions and approaches.[127] In its 2007 report on the effectiveness of CME, the AHRQ found that simulation training generally is effective, especially for psychomotor (e.g., procedures or physical examination techniques) and communication skills.[119] However, "the strength of the evidence was considered low, due to the small number of appropriate studies, the scarcity of quantitative data, and a number of study limitations."[119(p.5)] McGaghie et al analyzed the effectiveness of simulation-based medical education in facilitating deliberate practice, where the goal is "constant skill improvement, not just skill maintenance."[124 (p.706)] The authors concluded that simulation-based medical education in relation to deliberate practice is "superior to traditional clinical medical education in achieving specific clinical skill acquisition goals."[124(p.706)]

Fidelity, described as "the degree to which the simulator replicates reality," can vary in simulation-based medical education (e.g., high-fidelity or low-fidelity simulation). In a review of high-fidelity medical simulation, the authors stated it is "educationally effective and simulation-based education complements medical education in patient care settings."[128(p.10)] However, an article providing recommendations on the use of simulation technology for CME suggests further research to measure the relationship of simulator fidelity to the intended outcomes of CME interventions.[107] High-fidelity simulators can be very costly, and low-fidelity, low-cost training models can yield outcomes equal to much more expensive simulators.[129] In summary, simulation-based medical education is an effective instructional technique that may

have positive effects on patient care practices and patient outcomes. However, more expensive simulation models may not necessarily be more effective than lower cost models, depending on the specific training goals.

Internet-Based CE

Internet-based CE activities have positive characteristics as well, including "convenience, flexibility, reduced travel time and expense, multimedia format and possibly adaptability to different learning styles."[29(p.82)] Internet-based activities have been found to have similar levels of effectiveness, in terms of improving knowledge, as courses or meetings.[29] One particularly popular method of Internet-based CE is Internet point-of-care CE.[29] This structured and self-directed online learning method allows health professionals to review a clinical question, identify "relevant sources of information," and describe "the application of these findings to practice."[29(p.83)] Though popular among health professionals, the impact of this method on patient outcomes is unknown. The 2006 longitudinal study, "The Physicians' Preferences in CME," suggested that "Internet CE activities have become more popular than attendance at out-of-town meetings."[29(p.85)] Despite the differences between Internet-based and traditional CE methods, a number of studies have demonstrated that the two methods offer similar effectiveness in their ability to improve knowledge.[130]

Interprofessional Education

Interprofessional education "occurs when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes."[30(p.13)] Seminal reports related to the improvement of CE for health professionals have recommended interprofessional education, including reports from the Institute of Medicine,[15] the Josiah Macy, Jr. Foundation,[18,29] and the World Health Organization.[30] This approach to CE is also being promoted through the Interprofessional Education Collaborative[131] and the Coordinating Center for Interprofessional Education and Collaborative Practice.[132]

Recent evidence also cites the positive impact of interprofessional education on several aspects of health care including collaborative team behavior, reduction of clinical error rates, improved patient outcomes, and improved information sharing.[31] Even though the MHS currently has interprofessional education offerings, such as the Strategies and Tools to Enhance Performance and Patient Safety curriculum, there may be additional opportunities to capitalize on the documented benefits of this approach.

Assessment of CE

Although the studies described above have aimed to examine the outcomes and effectiveness of the various types of CE activities, terminology used for CE activities and in conducting CE research vary.[32] For example, there are variations in the terms used to define educational interventions, target audiences, learning objectives, content areas, and teaching methodologies. As a result, there is a lack of standardized approaches to CE and related research efforts, which make comparisons difficult.[32]

Overall, research suggests that effective CE activities should align with the established principles of adult education, where learning activities are expected to be active, engaging, and focused on the needs of the learner.[121] Thus, targeted CE, matched to a health professional's needs, should

more appropriately engage health professionals as adult learners. However, Davis et al noted that external factors, such as practice-based suggestions, peer-evaluations and other objective needs assessments, appear to be precursors of effective CE interventions.[121] This is further supported by a 2006 systematic review comparing how accurately physicians self-assess competence compared to external observations, in which the authors found that "physicians have a limited ability to accurately self-assess," and that "the processes currently used to undertake professional development and evaluate competence may need to focus more on external assessment."[133(p.1094)] Such feedback could better sustain clinical changes over time.

Parker and Parikh proposed that CME activities include an assessment of learner needs, program design to meet learner needs, and outcome measurement.[134] In their discussion of the future of CME, Lowe et al note that evaluating learning needs "goes far beyond a review of performance data into a rich source of information to support physicians' learning and change process."[32(p.71S)] Needs assessments can determine "blind spots" in knowledge or provide an opportunity for feedback to the learner regarding performance change.[32] Additionally, the authors recognized a "dimension of needs assessments is the opportunity to close the loop with the learner with feedback on the implementation of a performance change."[32(p.71S)] Therefore, regularly including needs assessments in DoD health professionals' CE planning is likely to provide a basis for more effective CE programs.

In a recent article by Bird et al, the authors note that quality improvement/performance improvement activities allow health professionals to "self-assess their practice and make individualized plans to correct deficits with systematic solutions."[135(p.156)] Although performance improvement has become an accepted methodology for measuring and changing practice, there is a dearth of evidence on its effectiveness. Performance improvement activities have also been coupled with CME, known as PI-CME. Bird et al studied the effectiveness of PI-CME in the management of patients with diabetes, concluding that the CME activity "appears to have had a positive impact on family physician learners who care for patients with diabetes."[135(p.162)] Furthermore, they stated that the results "suggest improvement in both systems-based and clinical performance."[135(p.162)] Another article investigated PI-CME's effects on cardiometabolic risk factor management in primary care patients. The authors found that the PI-CME activity was "a useful strategy in assisting physicians to improve their management of cardiometabolic control rates in female patients with abnormal cholesterol control."[136(p.25)]

The 2014 *Military Health System Review: Final Report to the Secretary of Defense* stated: "MHS governance can support performance improvement with better analytics, greater clarity in policy, and aligned training and education programs."[14(p. 1)] Performance improvement is a signature activity of high reliability organizations. Bird et al also note that performance measurement, as part of an improvement cycle, is integral to physician training and is already a required component of Maintenance of Certification and Maintenance of Licensure.[135] As the MHS moves toward becoming a high reliability and rapid learning organization,[14] the concept of a feedback loop within the system will become increasingly important to achieving quality care, including process improvement and implementation of best practices.

Increased use of outcome and other performance metrics throughout the system should provide a variety of feedback indicators that could be used to evaluate the practices and competencies of health professionals. Potential feedback measures include clinical outcomes; financial metrics (including referral for expensive care out of the system); epidemiological metrics, with morbidity and mortality data to account for adverse events; and readiness-focused metrics, examining whether health professionals have the opportunities to maintain the unique skills needed for providing care in austere wartime locations. This move toward increased use of performance metrics and accountability emphasizes the vision of health care systems to become high reliability organizations. If improved outcomes can be correlated with CE activities, this would provide new information on associated cost effectiveness as well as other nonmonetary benefits. Innovative approaches and foresight in organizing and developing information technology requirements are necessary to move purposefully in this direction. Co-location of CE, quality, patient safety, and credentialing personnel/functions may be one organizational approach to enhancing collaborative improvement efforts and improving visibility of the impact of one element of the system on others.

Although the *Military Health System Review: Final Report to the Secretary of Defense* was intended to assess the sufficiency of training of health professionals in the areas of access, safety, and quality, it was not intended to assess the organization and effectiveness of medical readiness training. Following Operation DESERT STORM, both the DoD Inspector General and the General Accounting Office conducted independent reviews of deployment medical operations in the Military Departments and identified areas for improvement in medical readiness training.[36-40] Although there are ongoing internal efforts to improve in specific areas, such as combat casualty care, and each Military Department and the DHA have medical readiness functions that continually seek opportunities to improve overall medical readiness training,[137,138] similar independent reviews were not located examining medical readiness training during the Global War on Terror.

Additionally, unique challenges associated with the planned drawdown from current conflicts, fiscal constraints, and decreases in emergency care and inpatient capabilities in military treatment facilities will have an impact on the ability of military health professionals to maintain clinical currency.[41] The DHA Medical Readiness Division also indicated that other areas have been identified for improvement that include education and training on medical intelligence to support medical planning, composite risk assessment, global health issues, and aeromedical evacuation processes; and standardization of prehospital training modalities.[***]

Thus, there may be additional opportunities to identify areas for improvement in medical readiness sustainment training programs across career fields and Military Departments. Since this training is an important aspect of CE for military health professionals, it may be of value to

---

[***]The Joint Chiefs of Staff published the *Joint Concept for Health Services* August 31, 2015 after the report's findings and recommendations were publically deliberated on August 20, 2015. This document calls for "improved performance through appropriate balance between sustainment of current readiness through healthcare delivery in medical beneficiary markets, targeted warfighting clinical education and training, and investment in future capabilities."[139]

periodically conduct an independent review of the content and effectiveness of these programs to identify areas for improvement and supplement internal reviews.

Finding 6 – Interprofessional Education: Recent reviews of CE research indicate significant benefits are associated with well-designed interprofessional education activities.[31]

>   **Recommendation 6: DoD should continually review the effectiveness of interprofessional education initiatives to identify opportunities to add, modify, or delete activities to optimize educational benefits.**

Finding 7 – Assessing CE Effectiveness: A review of current literature suggests that research on the effectiveness of CE has been hindered by inconsistent terminology, definitions, methodology, and outcome metrics. This creates challenges in determining the most effective approach to measuring, achieving, and maintaining competency.

>   **Recommendation 7.1: DoD should collaborate with other stakeholders to develop a common approach and methodology for assessing the effectiveness of CE in accomplishing specific health care goals.**

>   **Recommendation 7.2: DoD should lead the health care field in facing these challenges through the research, development, application, and delivery of new technologies and learning theories to provide exceptional, cost-effective, evidence-based CE.**

Finding 8 – Relationship between CE and Performance Trends: Effective CE that has a positive impact on performance metrics should result in cost savings. DoD does not have an integrated system to assess the relationship between CE and individual, institutional, and enterprise performance trends in patient safety, quality, cost, and efficiency.

>   **Recommendation 8: DoD should explore the design, creation, and implementation of an integrated system to develop appropriate CE initiatives and related metrics in order to support a culture of patient safety and improve quality, cost of services, and efficiency of operations at the individual, institutional, and enterprise levels.**

Finding 9 – Performance Improvement: The 2014 *Military Health System Review: Final Report to the Secretary of Defense* highlighted the need to support performance improvement with better analytics, greater clarity in policy, and aligned training and education programs.[14]

>   **Recommendation 9: Consistent with the *Military Health System Review: Final Report to the Secretary of Defense*, DoD should develop, periodically update, and use access, quality, and patient safety metrics to prioritize and target CE toward those areas needing the most improvement at both the institutional and enterprise levels.**

Finding 10 – Medical Readiness: With the drawdown of personnel and changes in the MHS infrastructure, new challenges in medical readiness training are emerging.

> **Recommendation 10**: **To supplement ongoing internal reviews, the Defense Health Agency, on behalf of the MHS, should conduct periodic independent reviews of the content and effectiveness of general and career field specific medical readiness sustainment training. The results of these reviews should be used to prioritize and target CE toward those areas needing the most improvement.**

References

5.   U.S. Department of Defense. Medical Readiness Training. In: U.S. Department of Defense, ed. *Department of Defense Instruction 1322.24*. Washington, DC 2011.

10.   McGrath E. Implementation of Updated Conference Oversight Requirements. In: Deputy Chief Management Officer, ed. Washington, DC 2013.

12.   U.S. Government Accountability Office. *Defense Science and Technology: Further DOD and DOE Actions Needed to Provide Timely Conference Decisions and Analyze Risks from Changes in Participation.* Washington, DC 2015.

14.   U.S. Department of Defense. *Military Health System Review: Final Report to the Secretary of Defense.* Washington, DC 2014.

15.   Committee on Planning a Continuing Health Professional Education Institute, Board of Health Care Services, Institute of Medicine. *Redesigning continuing education in the health professions.* Washington, DC: National Academies Press 2010.

18.   Association of American Medical Colleges, American Association of Colleges of Nursing. Lifelong learning in medicine and nursing, final conference report. 2010; Washington, DC.

20.   U.S. Department of the Army. Professional Education and Training Programs of the Army Medical Department. In: U.S. Department of the Army, ed. *Army Regulation 351-3*. Washington, DC 2007.

21.   U.S. Department of the Air Force. Professional Board and National Certification Examinations. In: U.S. Department of the Air Force, ed. *Air Force Instruction 41-104*. Washington, DC 2014.

22.   U.S. Department of the Navy. Policies and Procedures for Funding Professional Credentials and Certification Examinations. In: U.S. Department of the Navy, ed. *BUMED Instruction 1500.20*. Washington, DC 2014.

23.   Federation of State Medical Boards. *Continuing Medical Education, Board by Board Overview.* Federation of State Medical Boards; 2014. http://www.fsmb.org/Media/Default/PDF/FSMB/Advocacy/GRPOL_CME_Overview_by_State.pdf. Accessed July 31, 2014.

24.   Federation of State Medical Boards. State-specific requirements for initial medical licensure [Web page]. 2014; http://www.fsmb.org/policy/public-resources/state_specific. Accessed April 13, 2015.

25.   National Council of State Boards of Nursing. *State and Territorial Boards of Nursing: What Every Nurse Needs to Know.* 2011. https://www.ncsbn.org/What_Every_Nurse_Needs_to_Know.pdf. Accessed April 13, 2015.

26.   American Academy of Physicians Assistants. Statutory and regulatory requirements for licensure and license renewal [Web page]. https://www.aapa.org/WorkArea/DownloadAsset.aspx?id=599

27.   Work R. Update DoD Conference Guidance. Washington, DC 2015.

28. Defense Health Agency. Learning management systems migration [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training/Learning-Management-Systems-Migration. Accessed April 20, 2015.

29. Continuing education in the health professions: Improving healthcare through lifelong learning, proceedings of a conference sponsored by the Josiah Macy, Jr. Foundation. 2007; New York, New York.

30. Health Professions Network Nursing and Midwifery Office. *Framework for Action on Interprofessional Education & Collaborative Practice.* Geneva, Switzerland: World Health Organization;2010.

31. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: Effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst. Rev.* 2013;3:CD002213.

32. Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: Effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):69s-75s.

36. U.S. Department of Defense Inspector General. *Medical Readiness Training for Reserve Physicians.* Arlington, VA: U.S. Department of Defense Inspector General;1996.

37. U.S. General Accounting Office. *Medical Readiness Training: Limited Participation by Army Medical Personnel.* Washington, DC 1993.

38. U.S. General Accounting Office. *Operation DESERT STORM: Full Army Medical Capability Not Achieved.* Washington, DC 1992.

39. U.S. General Accounting Office. *Operation DESERT STORM: Improvements Required in the Navy's Wartime Medical Care Program.* Washington, DC 1993.

40. U.S. General Accounting Office. *Operation DESERT STORM: Problems with Air Force Medical Readiness.* Washington, DC 1993.

41. Office of the Air Force Materiel Command Surgeon. Concept of Operations (CONOPS) for Sustained Medical and Readiness Trained (SMART). 2015.

49. Education and Training [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training. Accessed September 29, 2014.

50. Wright J. Response to Congressional Defense Committees, Third Submission under Section 731 of the National Defense Authorization Act for Fiscal Year 2013, Plan for Reform of the Administration of the Military Health System. Washington, DC: Under Secretary of Defense for Personnel and Readiness; 2013.

55. American Medical Association. *The Physician's Recognition Award and Credit System.* American Medical Association;2010.

75. Dorman T. *The Value Proposition of CME.* [PowerPoint]. First Fridays Webinar Series: Medical Education Group (MEG);2011.

76. National Board of Public Health Examiners. About the CPH [Web page]. https://www.nbphe.org/aboutthecph.cfm. Accessed April 8, 2015.

77. Accreditation Council for Continuing Medical Education. *ACCME 2014 Annual Report.* 2015.

78. American Academy of Family Physicians. Contract negotiations: Five elements to consider [Web page]. 2015; http://www.aafp.org/practice-management/payment/contracts.html. Accessed April 8, 2015.

79. American Society of Pediatric Hematology/Oncology. Early career travel stipend award [Web page]. http://aspho.org/career-development/awards/early-career-travel-stipend. Accessed April 8, 2015.

80. Penn State Hershey Pathology and Laboratory Medicine. General information [Web page]. 2013; http://www.pennstatehershey.org/web/pathology/education/residency/manual/general/policies Accessed April 8, 2015

81. Medscape. State CME requirements [Web page]. 2014; http://www.medscape.org/public/staterequirements. Accessed January 30, 2015.

82. Florida Board of Medicine. Renewals, medical doctor - unrestricted [Web page]. 2014; http://flboardofmedicine.gov/renewals/medical-doctor-unrestricted/. Accessed July 28, 2014.

83. Medical Board of California. Physicians and surgeons license renewal [Web page]. 2012; http://www.mbc.ca.gov/Licensees/License_Renewal/Physicians_and_Surgeons.aspx. Accessed July 28, 2014.

84. Florida Board of Nursing. Registered nurse continuing education (CE/CEU) requirements [Web page]. 2015; http://floridasnursing.gov/renewals/registered-nurse-rn/. Accessed January 12, 2015.

85. California Medical Association. *Significant New California Laws of Interest to Physicians for 2015.* 2014. http://www.cmanet.org/files/assets/news/2014/10/new-laws-2015-final-long.pdf. Accessed January 20, 2015.

86. American Nurses Association. *States Which Require Continuing Education for RN Licensure.* 2013. http://www.nursingworld.org/MainMenuCategories/Policy-Advocacy/State/Legislative-Agenda-Reports/NursingEducation/CE-Licensure-Chart.pdf. Accessed January 20, 2015.

87. Association of State and Provincial Psychology Boards. *Continuing Education Requirements by Jurisdiction.* http://www.asppb.org/HandbookPublic/Reports/default.aspx?ReportType=ContinuingEducation. Accessed January 20, 2015.

88. American Board of Medical Specialties. *ABMS Member Boards Part IV Requirements.* 2013. http://www.abms.org/Maintenance_of_Certification/competencies_pdf/ABMS_MemberBoardsRequirementsProject_MOC_PartIV_FINAL.pdf. Accessed July 31, 2014.

89. Undersecretary of Defense for Personnel and Readiness. Medical Quality Assurance (MQA) and Clinical Quality Management in the Military Health System (MHS). In: Department of Defense, ed2013.

90. Office of the Army Surgeon General. MEDCOM Guidance for Implementation of Army Directive 2014-02 (Army Conference Policy). In: U.S. Army, ed. Fort Sam Houston, Texas 2014.

91. Poland GA. DoD Conference Attendance. In: Rouse D, ed2015.

92. Office of the Deputy Chief Management Officer. DoD-Hosted Conference Annual Reports. http://dcmo.defense.gov/products-and-services/conference-policies-controls/annual-reports.html. Accessed June 5, 2015.

93. Clark J. Conference Attendance Policy. In: Defense Health Agency, ed. Walter Reed National Military Medical Center 2015.

94. U.S. Department of Defense. U.S. Army Command continuing medical education [Web page]. http://health.mil/Training-Center/US-Army-Command-Continuing-Medical-Education. Accessed June 4, 2015.

95. U.S. Army Medical Department. Center for Professional Education and Training [Web page]. 2013; http://www.cs.amedd.army.mil/portlet.aspx?id=4ac06b51-6b3e-4ab4-91c5-0e4120193c01. Accessed June 11, 2015.

96. U.S. Navy. Continuing medical education (CME) mission statement [Web page]. 2010; http://www.med.navy.mil/sites/nmpdc/professional-development/SitePages/Continuing%20Medical%20Education.aspx. Accessed June 4, 2015.

97. U.S. Navy Bureau of Medicine and Surgery. Continuing health education [Web page]. http://www.med.navy.mil/sites/nmpdc/professional-development/SitePages/Continuing%20Health%20Education.aspx Accessed June 11, 2015.

98. U.S. Air Force. Air Force Physician Education Branch [Web page]. http://www.airforcemedicine.af.mil/physicianeducationbranch/. Accessed June 4, 2015.

99. Payment of Expenses to Obtain Professional Credentials, 10 U.S.C. 2015. 2012.

100. The Joint Commission. *Primary Source Verification.* 2008. http://www.jointcommission.org/mobile/standards_information/jcfaqdetails.aspx?StandardsFAQId=241&StandardsFAQChapterId=5. Accessed August 5, 2014.

101. American Public Health Association. Annual meeting & exposition [Web page]. http://www.apha.org/meetings/annual/. Accessed September 18, 2014.

102. American Dental Association. ADA 2014 America's dental meeting [Web page]. http://www.ada.org/en/meeting/attendee-information/. Accessed September 19, 2014.

103. U.S. Army Medical Research and Materiel Command. CME activity details [Web page]. http://mhsrs.com/cme/activity-details. Accessed September 15, 2014.

104. The Society of Federal Health Professionals. About AMSUS [Web page]. 2014; http://www.amsus.org/about-amsus/. Accessed September 29, 2014.

105. MedicineNet. Definition of grand rounds [Web page]. 2012; http://www.medicinenet.com/script/main/art.asp?articlekey=40370. Accessed July 27, 2015.

106. Holy Cross Health. Grand rounds schedule [Web page]. 2015; http://www.holycrosshealth.org/grand-rounds-schedule Accessed July 27, 2015.

107. Curtis MT, DiazGranados D, Feldman M. Judicious use of simulation technology in continuing medical education. *The Journal of Continuing Education in the Health Professions.* Fall 2012;32(4):255-260.

108. Uniformed Services University of the Health Sciences. About us [Web page]. 2014; http://simcen.usuhs.edu/aboutus/Pages/default.aspx Accessed June 24, 2015.

109. McGaghie WC, Siddall VJ, Mazmanian PE, Myers J. Lessons for continuing medical education from simulation research in undergraduate and graduate medical education: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):62s-68s.

110. American Nurses Association. Continuing professional development [Web page]. http://www.nursingworld.org/MainMenuCategories/CertificationandAccreditation/Continuing-Professional-Development. Accessed September 29, 2014.

111. Joint Medical Executive Skills Institute. About JMESI [Web page]. 2012; https://jmesi.army.mil/. Accessed September 29, 2014.

112. Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. Monthly webinars [Web page]. 2015; http://www.dcoe.mil/Training/Monthly_Webinars.aspx. Accessed September 29, 2014.

113. American Academy of Family Physicians. Member CME requirements [Web page]. http://www.aafp.org/about/membership/cme-requirements.html Accessed July 15, 2015.

114. American Nurses Credentialing Center. ANCC Annual Symposim on Continuing Nursing Education [Web page]. http://www.nursecredentialing.org/CNE-Symposium. Accessed September 29, 2014.

115. American Nurses Credentialing Center. Nursing education gets flipped at the ANCC Annual Symposium on Continuing Nursing Education [Web page]. http://www.nursecredentialing.org/FunctionalCategory/AboutANCC/Headlines/ANCCFlippedEducationSymposium.html. Accessed December 15, 2014.

116. Hollands FM, Tirthali D. *MOOCs: Expectations and Reality*. Teachers College: Center for Benefit-Cost Studies of Education, Columbia University; 2014.

117. Liyanagunawardena TR, Williams SA. Massive open online courses on health and medicine: review. *J. Med. Internet Res.* 2014;16(8):e191.

118. The Alliance for Continuing Education in the Health Professions. Alliance issues call for Comments on its Quality Improvement Education Roadmap. Baltimore, MD.

119. The Johns Hopkins University. *Effectiveness of Continuing Medical Education.* Rockville, MD: Agency for Healthcare Research and Quality;2007.

120. Forsetlund L, Bjorndal A, Rashidian A, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes (Review). *The Cochrane Library.* 2012(11).

121. Davis D, O'Brien M, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA.* 1999;282(9):867-874.

122. Leung CP, Klausner AP, Habibi JR, King AB, Feldman A. Audience response system: a new learning tool for urologic conferences. *The Canadian journal of urology.* Dec 2013;20(6):7042-7045.

123. Stanford Center for Immersive and Simulation-based Learning. Simulation Modalities. 2015; http://cisl.stanford.edu/what_is/sim_modalities/. Accessed June 24, 2015.

124. McGaghie WC, Issenberg SB, Cohen ER, Barsuk JH, Wayne DB. Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. *Acad. Med.* Jun 2011;86(6):706-711.

125. Cook DA, Brydges R, Hamstra SJ, et al. Comparative effectiveness of technology-enhanced simulation versus other instructional methods: a systematic review and meta-analysis. *Simulation in healthcare : journal of the Society for Simulation in Healthcare.* Oct 2012;7(5):308-320.

126. Cook DA, Erwin PJ, Triola MM. Computerized virtual patients in health professions education: a systematic review and meta-analysis. *Acad. Med.* Oct 2010;85(10):1589-1602.

127. Cook DA. The Literature on Health Care Simulation Education: What Does It Show? *Perspectives on Safety.* 2013.

128. Barry Issenberg S, Mcgaghie WC, Petrusa ER, Lee Gordon D, Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med. Teach.* 2005;27(1):10-28.

129. Norman G, Dore K, Grierson L. The minimal relationship between simulation fidelity and transfer of learning. *Med. Educ.* Jul 2012;46(7):636-647.

130. Wutoh R, Boren SA, Balas EA. eLearning: A review of internet-based continuing medical education. *J. Contin. Educ. Health Prof.* 2004;24(1):20-30.

131. Interprofessional Education Collaborative. What is Interprofessional Education? 2015; https://ipecollaborative.org/About_IPEC.html. Accessed May 29, 2015.

132. Health Resources and Services Administration. Interprofessional Education. http://bhpr.hrsa.gov/grants/interprofessional/. Accessed May 29, 2015.

133. Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA.* Sep 6 2006;296(9):1094-1102.

134. Parker K, Parikh SV. Applying Prochaska's model of change to needs assessment, programme planning and outcome measurement. *J. Eval. Clin. Pract.* Nov 2001;7(4):365-371.

135. Bird GC, Marian K, Bagley B. Effect of a performance improvement CME activity on management of patients with diabetes. *J. Contin. Educ. Health Prof.* Summer 2013;33(3):155-163.

136. Joyner J, Moore MA, Simmons DR, et al. Impact of performance improvement continuing medical education on cardiometabolic risk factor control: the COSEHC initiative. *J. Contin. Educ. Health Prof.* Winter 2014;34(1):25-36.

137. US. Army Institute of Surgical Research. Joint Trauma System. http://www.usaisr.amedd.army.mil/10_jts.html. Accessed August 11, 2015.

138. U.S. Army Medical Research and Materiel Command. Combat Casualty Care Research Program. 2015; https://ccc.amedd.army.mil/Pages/default.aspx. Accessed August 11, 2015.

139. Joint Chiefs of Staff. Joint Concept for Health Services. Washington, DC 2015.

3. CONTINUING EDUCATION AS IT RELATES TO PROFESSIONAL DEVELOPMENT

> *"Requirements that are based on credit hours rather than outcomes—and that vary by state and profession—are not conducive to teaching and maintaining these core competencies aimed at providing quality care."*[15 (p.5)]
>
> Committee on Planning a Continuing Health Professional Education Institute, Institute of Medicine

The Institute of Medicine (IOM) Report, *Redesigning Continuing Education in the Health Professions*, recommended shifting the system of continuing education (CE) toward a comprehensive vision of professional development, called continuing professional development (CPD).[15] The report states that CPD "includes components of CE but has a broader focus, such as teaching how to identify problems and apply solutions, and allowing health professionals to tailor the learning process, setting, and curriculum to their needs."[29(p.5)]

A number of organizations promote the use of professional development plans or learning plans for health professionals. For example, the Nurse Manager Leadership Partnership uses the Nurse Manager Inventory Tool, which allows for self-evaluation and external assessment by a supervisor to create individual professional development plans.[140] The Department of Veterans Affairs (VA) uses Individual Development Plans aimed at helping employees achieve short- and long-term goals, identify the necessary skills to achieve these goals, and discover learning and development opportunities to build such skills.[141] The VA also utilizes the High Performance Development Model in its leadership programs. This model promotes career development through continuous learning, coaching/mentoring, and assessment throughout an individual's career.[142] Professional development plans would allow individuals, mentors, and supervisors to track progress in meeting professional goals while also providing a roadmap for planning and budgeting purposes. As discussed in Section 2.4, external feedback is an important component of a comprehensive needs assessment for an individual's professional development, allowing for the identification of knowledge gaps.[32] Therefore, creating individual professional development plans with external input could assist in targeting CE, addressing deficiencies, and improving performance of Department of Defense (DoD) health professionals.

Although periodically reporting the completion of a minimum number of CE credit hours has been the standard for maintaining licensure and certification of health professionals, the field of CE and health care is evolving. The trend is moving from simply achieving minimum credit hours to focusing on maintaining competency and improving health outcomes. The 2001 IOM report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, stated that health professionals should provide care that is "safe, effective, patient-centered, efficient, timely, and equitable…."[63(p.xi)] A 2003 IOM report, *Health Professions Education: A Bridge to Quality*, identified five core competencies for all health professionals: (1) patient-centered care; (2) interdisciplinary team-based care; (3) evidence-based practice; (4) quality improvement; and (5) the use of health informatics.[63] These competencies notably reflect a focus on quality improvement and achievement of safe, effective, and state-of-the-art health care.

3.1 MAINTENANCE OF CERTIFICATION

The Maintenance of Certification (MOC) program, sponsored by the American Board of Medical Specialties (ABMS) and its member boards, was founded on a series of competencies associated with the provision of "high-quality care for the diagnosis and treatment of disease, promotion of health and prevention of disease, and the physical and emotional support of patients and families."[143] The program was adopted in 1999 by the Accreditation Council for Graduate Medical Education and ABMS. It is designed to provide a structured approach for physicians to maintain their medical expertise using periodic assessments every few years in a continuous spectrum of professional development.[144] The core competencies of the program include the following:

- **Practice-based Learning and Improvement:** Show an ability to investigate and evaluate patient care practices, appraise and assimilate scientific evidence, and improve the practice of medicine.
- **Patient Care and Procedural Skills:** Provide care that is compassionate, appropriate, and effective for health problems and to promote health.
- **Systems-based Practice:** Demonstrate awareness of and responsibility to the larger context and systems of health care. Be able to call on system resources to provide optimal care (e.g., coordinating care across sites or serving as the primary case manager when care involves multiple specialties, professions, or sites).
- **Medical Knowledge:** Demonstrate knowledge about established and evolving biomedical, clinical, and cognate sciences and their applications in patient care.
- **Interpersonal and Communication Skills:** Demonstrate skills that result in effective information exchange and teaming with patients, their families, and professional associates (e.g., fostering a therapeutic relationship that is ethically sound, uses effective listening skills with nonverbal and verbal communication; working as both a team member and at times as a leader).
- **Professionalism:** Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diverse patient populations.[143]

Taken together these core competencies are meant to target the full scope of health care practice on a continuous basis, beyond basic CE. They exist within a four part framework of: (1) professionalism and professional standing; (2) lifelong learning and self-assessment; (3) assessment of knowledge, judgment and skills; and (4) improvement in medical practice.[145] Maintaining skills and competencies across this framework will be essential for health professionals as health care practice continues to evolve in relation to the increasing prevalence of interprofessional health teams, emerging fields such as personalized medicine, and the changing needs of society. To accommodate these shifts, the ABMS reviewed these standards in 2009 and again in 2014, and updates were made in the areas of professionalism, patient safety, performance improvement, and incorporating judgment into examinations.[145]

The American Osteopathic Association (AOA), American Medical Association, National Board of Medical Examiners, Council of Medical Specialty Societies, and Association of American Medical Colleges are some of the other organizations using the MOC concept to promote continuous professional development. The AOA process, osteopathic continuous certification (OCC), is similar to MOC. It involves five components: (1) unrestricted licensure; (2) lifelong

---

learning/continuing medical education; (3) cognitive assessment; (4) practice performance assessment and improvement; and (5) continuous AOA membership. OCC is intended to be a "continuous, lifelong process, and ensures that board-certified DOs [Doctor of Osteopathic Medicine] maintain currency and demonstrate competency in their specialty area."[146] One of the goals of the Federation of State Medical Boards (FSMB) is to develop a Maintenance of Licensure (MOL) system that is "carefully integrated and coordinated with activities of other physician organizations," and aims "to minimize burdens or overlap for physicians who are already involved in continuous professional development activities, such as MOC or OCC."[147] Additionally, given the consistency of MOL activities with MOC and OCC activities, the FSMB recommends that physicians engaged in MOC or OCC be considered compliant with the major components of MOL.

The movement toward MOC has drawn some criticism from physicians, as MOC has been deemed an expensive and time-consuming process and its impact on patient outcomes is unclear.[148] Alternatively, proponents of MOC have emphasized MOC as a movement to ensure that physicians' knowledge and skills are current and to provide patients with high-quality care.[148,149] As a result of feedback from physicians, the MOC process has been evolving, with the ABMS approving strategic priorities such as the development of more evidence documenting the effect of MOC on quality of care.[149]

The competencies described by MOC also highlight the interprofessional and integrated team-based health environment, emphasizing the importance of an interactive exchange of ideas and knowledge with open debate. One example of this evolution is the creation of checklists, such as those developed by the World Health Organization.[150] These checklists, intended to be globally applicable, include one targeted at reducing the rate of major surgical complications by creating a simple team-based review of safety processes.[150] By encouraging review of the checklist as a team, surgical site infection rates are reported to have been reduced and appropriate antibiotic use has increased.[150]

In another move toward a more integrated health environment, the American Nurses Credentialing Center, along with the Accreditation Council for Continuing Medical Education, and the Accreditation Council for Pharmacy Education have collaborated to provide accreditation from all three organizations in one process (The Joint Accreditation for Inter-professional Continuing Education™).[151] Such accreditation processes encourage interprofessional collaboration, foster a team environment, and promote interprofessional relationships.

3.2 IN-PERSON INTERACTIONS

Although Internet-based options have been shown to be at least as effective in imparting knowledge as traditional formats of CE,[130] it is important to consider the overall professional development contributions of in-person experiences. Venues such as "online courses, local events, and webinars" provide options for DoD health professionals to meet their CE requirements.[152] However, the Pharmacy Consultant to the Army Surgeon General noted that "attendance at a conference also allows for many intangible benefits that take place in discussions after presentations and supports the development of networks to continue the sharing of knowledge." Additionally, participation provides "uninterrupted time away from the daily

demands of work to focus on learning, improving performance, and engendering commitment and involvement in DoD Pharmacy Initiatives."[152]

DoD Conference Attendance Policies

In September 2011, partly in response to media reports of high-profile misspending at conferences sponsored by the VA and the General Services Administration,[11] the Office of Management and Budget (OMB) issued a memorandum instructing all agencies "to conduct a thorough review of the policies and controls associated with conference-related activities and expenses."[6(p.2)] Shortly thereafter, President Barack Obama issued an Executive Order that aimed to cut waste and promote more efficient spending across the Federal Government, directing agencies to reduce spending on travel.[7] Following this order, OMB issued a second memorandum to the heads of executive departments and agencies that provided additional guidance on opportunities to improve efficiency, including those related to conference attendance and travel.[8]

In conjunction with the memoranda released by OMB, the Deputy Secretary of Defense released two memoranda addressing the issue of conference oversight in 2012 and 2013. The 2012 memorandum established a tiered approval process and identified senior leaders who would have the authority to approve conferences, although these individuals could further delegate approval of events costing less than $500,000.[9] This document also notes that the Secretary of Defense and the Deputy Secretary of Defense will maintain "visibility and accountability through Component reporting."[9(p.2)] A 2013 memorandum from the Deputy Secretary of Defense further clarified this guidance, delineating which events are to be considered conferences and modifying approving authorities.[10]

Implementation of this guidance has impeded the ability of DoD personnel to host and attend meetings and conferences,[11] both of which are traditional sources of CE for health professionals. Early impacts included cancellation of the 2012 Association of Military Surgeons of the United States' annual conference and the 2013 Military Health System (MHS) Conference, both as a result of the restrictions.[152] The OMB released additional alerts between 2013 and 2015 regarding guidelines on acceptable conference expenses and best practices[153], which authorized delegation of Secretary- or Deputy Secretary-level reviews to a level deemed appropriate by these officials.[154] However, despite these and other attempts to streamline approval processes, conference request decisions are still not being provided in a manner that meets applicants' needs.[12]

In the course of meetings with MHS leaders, it was noted that the process of using non-federal sources to fund conference-related travel for DoD health professionals is cumbersome. Since non-federal source travel is a gift to the government, not the traveler, regular orders must be issued and the travel regulations followed.[155] To receive approval for non-federal source travel, the individual's normal travel approving authority must first make a number of determinations, such as whether attendance is related to official duties, whether there are conflicts of interest, and the identities of expected conference participants. The travel regulations require the government to completely fund the travel and states that no direct payment can be provided to the traveler. Travel regulations also require that all authorized travel expenses must be accounted for, thus the

travel authority must be willing to fund any normal expense that the non-federal entity will not.[155]

The procedures require a working knowledge of the both 31 United States Code §1353,[156] the applicable regulations of which are found at 41 Code of Federal Regulations (C.F.R.), Chapter 304,[157] as well as a working knowledge of the Joint Travel Regulations.[158] Thus, as with any administratively complex approval process, there may be opportunities to clarify, simplify, and streamline the steps involved. One approach may be to appoint and train a senior civilian travel authority as an advisor to the local Designated Agency Ethics Official (or designee) only for travel purposes to handle these issues. By appointing a senior civilian, turnover would be minimal and the individual could receive specific training on non-federal source travel, thus streamlining and adding consistency to the process. It should be noted that 5 C.F.R. 2638.202 does not require the Designated Agency Ethics Official to be an attorney or assigned to a legal office.[159] Thus creating and appointing a subject matter expert as an advisor would offer a viable option.

Benefits of Conference Attendance
Members of the scientific community generally agree that attending scientific meetings offers many benefits, even if they may be difficult to quantify or predict.[29,152,160-162] The 2007 Josiah Macy, Jr. Foundation report, *Continuing Education in the Health Professions*, highlighted the importance of professional conferences in "promoting socialization and collegiality among health professionals" and "opportunities for cross-disciplinary and cross-generational learning and teaching."[29(p.18)] Furthermore, participating in conferences may also contribute to career advancement of the individual and advancement of the health profession.[161] In a 2012 *Journal of the American Medical Association* editorial, Ioannidis contended that travelling to and hosting conferences may be costly and scientific findings could be presented virtually.[163] However, Drife countered that relating to other professionals virtually is not as effective as meeting in-person.[164] Furthermore, attending conferences allows health professionals the opportunity to discuss their research findings and receive feedback, even if data are preliminary, possibly leading to redesign of follow-up studies or reanalysis of data.[160] A 2014 report published by the National Academy of Sciences noted that professional conferences and meetings bring together large concentrations of junior and senior researchers, allow for informal information exchange, and provide access to the newest research findings. The authors state, "maintaining knowledge through literature is inadequate as there can be a one to two year lag between peer-review publication and current discovery."[162(p.45)]

It is the opinion of the Defense Health Board that in-person activities do provide tangible benefits, such as sharing current knowledge and insight, building professional relationships and trust through networking and mentoring, and fostering successful career development. A summary of potential benefits associated with participation in CE conferences and meetings includes the following:

- Acquiring CE necessary for State licensure and MOC
- Enhancing clinical knowledge and skills transfer through participation in CE sessions[15,31]
- Presenting research in a professional forum to disseminate new knowledge to peers, receive critical feedback to enhance follow-on work, and enhance speaking skills[160]

- Participating in the organization and operation of a professional society meeting to enhance organizational and leadership skills and demonstrate to civilian colleagues a willingness to contribute to the advancement of the profession
- Teaching at a professional society meeting to enhance instructional skills, share experience/knowledge, and enhance perception of the MHS as a professional organization
- Networking and building trust in relationships with military and civilian colleagues
- Opportunities for collaboration on research; career mentoring; and discussion of larger organizational or systemic issues, potential best practices, and strategies for advocacy/improvement
- Retention of highly qualified individuals: DoD policies need to be informed by civilian sector policies to retain a highly skilled workforce.

As noted above, attending conferences allows DoD health professionals to develop and maintain networking and mentoring relationships. To this point, a review by Murphy and Ensher concluded that individuals "in mentoring relationships receive more in the way of promotions, salary increases, and have higher levels of career satisfaction" as compared to those individuals not in mentoring relationships.[165(p.231)] In this review the authors also concluded that mentor relationships are an important "method of management development and succession planning."[165(p.232)] Mentoring is essential to career development in the military environment where personnel frequently change both positions and locations.

Limiting in-person interactions could become increasingly detrimental to the relationships between DoD and strategic partners, such as academia, the VA, and industry. In addition, collaboration between civilian and military health care professionals is important for the flow of ideas and sharing lifesaving techniques between these two communities. The recent successes in the use of the tourniquet in civilian emergency medicine illustrates the importance of this collaboration.[166] Decreased in-person interactions resulting from reduced participation in live CE activities, such as professional conferences, could also create an environment where DoD becomes isolated from the civilian health care sector and a wide array of inter-professional experiences. If DoD health professionals are unable to present their work at conferences, it may impede their ability to publish research and inhibit career advancement and peer recognition. Selection of speakers at conferences is often a competitive process; thus, appearing on the agenda reflects positive peer recognition.

While DoD should be innovative in meeting the changing needs of health professionals in a fiscally responsible manner, it is important to not devalue the important role of in-person interactions at meetings and conferences. Given the changing fiscal environment within the MHS and the Military Departments, it may be beneficial to hold smaller meetings and workshops with well-defined aims for health professionals, which would require fewer resources than large conferences.[163] A tiered system of prioritization for conference attendance also may be appropriate. This may include consideration of factors such as licensure or certification needs, operational readiness needs, the needs of the military treatment facility, or acceptance to present a scientific paper. The Navy Bureau of Medicine and Surgery outlines this approach in Instruction 5050.6, listing the following criteria to prioritize attendance at a meeting:

(1) CE directly related to wartime readiness requirements, such as courses or meetings emphasizing military health care or emergency, trauma, or critical care clinical topics.

(2) CE necessary to correct performance deficiencies identified in quality assurance reviews.

(3) Meetings at which the traveler will present a scientific paper or seminar that will enhance the status of a military program.

(4) CE or PUT [Professional Update Training] necessary to maintain state-of-the-art health care practice by faculty of Navy education and training programs.

(5) CE needed for certification, licensure, or credentialing and privileging.

(6) CE or PUT necessary to maintain state-of-the-art health care practice by health care providers.[167]

The reasons outlined above justify some level of participation by DoD health professionals in professional meetings and conferences to maintain the positive impact of these experiences without overtaxing DoD funding resources. Although the overall focus of military medicine should be on immediate military mission needs, a broader focus on the comprehensive educational needs of the health professional should also be considered, not only for the impact on the individual health professional, but also on the overall quality and safety of care provided by the MHS to its beneficiaries.

Finding 11 – External Feedback for CE Planning: There is a need for external feedback to the individual health professional to ensure knowledge and performance gaps are identified and incorporated into CE planning.

> **Recommendation 11: DoD health professionals, with peer review and supervisory input, should create and periodically update professional development plans to provide balanced and cost-effective individual and interprofessional CE roadmaps targeted to knowledge and performance gaps and goals.**

Finding 12 – Maintenance of Competency: The focus of CE is moving toward maintenance of competency, lifelong learning, and outcome-based effectiveness.

> **Recommendation 12: DoD should seek to be a leader in responding to the changing focus of CE by implementing a mechanism to continually monitor, evaluate, and improve the CE program to respond to these changes.**

Finding 13 – Importance of In-Person Interactions: Personal interactions during meetings and conferences provide essential opportunities for skills transfer, collaboration, information sharing, establishing trust among colleagues, mentorship, and professional development that benefit both the military and civilian health systems.

> **Recommendation 13.1: DoD should ensure that DoD health professionals have opportunities for regular in-person participation in CE meetings and conferences.**

Recommendation 13.2: Given the strategic benefit to DoD and its partnership with the civilian health system, additional priority for funding should be given to individuals serving as a presenter, moderator, or military liaison at an approved conference or meeting.

Recommendation 13.3: DoD should clarify and where possible simplify approval processes for non-federal source travel and expedite approval, within ethics and conflict of interest guidelines, for invited DoD presenters and contributors who are utilizing non-federal source travel.

References

6. Lew J. Eliminating Excess Conference Spending and Promoting Efficiency in Government. In: Executive Office of the President Office of Management and Budget, ed. Washington, DC 2011.

7. The White House Office of the Press Secretary. Executive Order 13589: Promoting Efficient Spending. Washington, DC 2011.

8. Zients Z. Promoting Efficient Spending to Support Agency Operations. In: Executive Office of the President Office of Management and Budget, ed. Washington, DC 2012.

9. Carter A. Implementation of Conference Oversight Requirements and Delegation of Conference Approval Authority. In: Deputy Secretary of Defense, ed. Washington, DC 2012.

10. McGrath E. Implementation of Updated Conference Oversight Requirements. In: Deputy Chief Management Officer, ed. Washington, DC 2013.

11. O'Keefe E. GSA Vegas scandal prompts bills that would gut spending on federal agency conferences [Web page]. 2012. http://www.washingtonpost.com/blogs/2chambers/post/bills-curbing-federal-agency-conference-introduced/2012/04/20/gIQASexaVT_blog.html.

12. U.S. Government Accountability Office. *Defense Science and Technology: Further DOD and DOE Actions Needed to Provide Timely Conference Decisions and Analyze Risks from Changes in Participation.* Washington, DC 2015.

15. Committee on Planning a Continuing Health Professional Education Institute, Board of Health Care Services, Institute of Medicine. *Redesigning continuing education in the health professions.* Washington, DC: National Academies Press 2010.

29. Continuing education in the health professions: Improving healthcare through lifelong learning, proceedings of a conference sponsored by the Josiah Macy, Jr. Foundation. 2007; New York, New York.

32. Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: Effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):69s-75s.

63. Committee on the Health Professions Education Summit. *Health Professions Education: A Bridge to Quality.* Washington, DC: National Academies Press;2003.

130. Wutoh R, Boren SA, Balas EA. eLearning: A review of internet-based continuing medical education. *J. Contin. Educ. Health Prof.* 2004;24(1):20-30.

140. American Organization of Nurse Executives, Nurses AAoC-C. Nurse Manager Skills Inventory. 2006.

141. U.S. Department of Veterans Affairs. MyCareer@VA. 2013; http://www.mycareeratva.va.gov/library/54 Accessed April 20, 2015.

142. U.S. Department of Veterans Affairs. Education Support. 2014; http://www.vacareers.va.gov/why-choose-va/education-support.asp. Accessed April 20, 2105.

143. American Board of Medical Specialties. Based on Core Competencies. *Board Certification* http://www.abms.org/board-certification/a-trusted-credential/based-on-core-competencies/. Accessed January 14, 2015.

144. Teirstein PS. Boarded to Death — Why Maintenance of Certification Is Bad for Doctors and Patients. *N. Engl. J. Med.* 2015;372(2):106-108.

145. American Board of Medical Specialties. Steps Towards Initial Certification and MOC. *Board Certification* http://www.abms.org/board-certification/steps-toward-initial-certification-and-moc/. Accessed January 14, 2015.

146. American Osteopathic Association. Osteopathic Continuous Certification. http://www.osteopathic.org/inside-aoa/development/aoa-board-certification/Pages/osteopathic-continuous-certification.aspx Accessed April 20, 2015.

147. Federation of State Medical Boards. Maintenance of Licensure (MOL) frequently asked questions [Web page]. 2015; http://www.fsmb.org/fsmb-mol/mol-faq. Accessed September 23, 2015.

148. Bendix JM. MOC: An Examination of Costs and Impact to Physicians. 2014; http://medicaleconomics.modernmedicine.com/medical-economics/content/tags/abms/moc-examination-costs-and-impact-physicians?page=full. Accessed April 20, 2015.

149. Iglehart JK, Baron RB. Ensuring Physicians' Competence — Is Maintenance of Certification the Answer? *N. Engl. J. Med.* 2012;367(26):2543-2549.

150. Haynes AB, Weiser TG, Berry WR, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *N. Engl. J. Med.* 2009;360(5):491-499.

151. Joint Accreditation. Joint Accreditation for Interprofessional Continuing Education. http://www.jointaccreditation.org/. Accessed September 29, 2014.

152. Basu S. Conference cancellations push DoD, VA clinicians to find other CME sources 2013; http://www.usmedicine.com/agencies/department-of-defense-dod/conference-cancellations-push-dod-va-clinicians-to-find-other-cme-sources/. Accessed March 20, 2015.

153. U.S. Office of Management and Budget. Controller Alert: Travel and Conferences. 2013

154. U.S. Office of Management and Budget. Controller Alert: Travel and Conferences   2015

155. The Judge Advocate General's Legal Center and School. Chapter H: Gifts. *Twelfth Ethics Counselor's Course Deskbook* 2014.

156. Acceptance of Travel and Related Expenses from Non-Federal Sources ,31 U.S.C. §1353. 2012.

157. Payment of Travel Expenses from a Non-Federal Source, 41 C.F.R. Chapter 304. 2012.

158. The Per Diem TaTACoAS. The Joint Travel Regulations: Uniformed Service Members and DOD Civilian Employees. In: Defense USDo, ed. Alexandria, VA2014.

159. Responsibilities of Agency Head, 5 C.F.R 2638.202. 2008.

160. Raloff J. Weighing the Costs of Conferencing. 2012; https://www.sciencenews.org/blog/science-public/weighing-costs-conferencing. Accessed June 3, 2015.

161. Ward K. The Importance of Attending Nursing Conferences. 2013; http://www.nursingexaminer.com/nursing-education/nursing-conferences/. Accessed June 3, 2015.

162. Committee on Globalization of Science and Technology: Opportunities and Challenges for the Department of Defense, Board on Global Science and Technology Policy and Global Affairs, National Research Council. *Strategic Engagement in S&T: Opportunities for Defense Research.* Washington, DC2014.

163. Ioannidis JA. ARe medical conferences useful? and for whom? *JAMA.* 2012;307(12):1257-1258.

164. Drife JO. Are international conferences an outdated luxury the planet can't afford? No. *BMJ.* 2008;336.

165. Murphy SE, Ensher EA. The Role of Mentoring Support and Self-Management Strategies on Reported Career Outcomes. *Journal of Career Development.* 2001/06/01 2001;27(4):229-246.

166. Loyd J. Emergency tourniquets, war lessons saved lives in Boston. 2013; http://www.usatoday.com/story/news/nation/2013/04/17/tourniquets-emergency-boston/2091079/. Accessed January 16, 2015.

167.   U.S. Navy Bureau of Medicine and Surgery. Continuing Education (CE), Professional Update Training (PUT) and Alternative Instructional Systems (AIS) for Medical Department Personnel. In: Navy Dot, ed. Washington, DC2008.

4. THE FUTURE OF CONTINUING EDUCATION WITHIN THE DEPARTMENT OF DEFENSE

> *"Just as the MHS often leads the nation in health education, training, research, and technology, it also must lead in efforts to consistently deliver reliable performance and constantly improve quality and safety with each care experience."[14]*
>
> U.S. Department of Defense[14]
> *Military Health System Review: Final Report to the Secretary of Defense*

Several organizations have conducted reviews and provided recommended priorities for transforming continuing education (CE) for health professionals to improve the relevancy and effectiveness of these activities. In 1996, the Institute of Medicine (IOM) launched a three-phase quality initiative, publishing a series of reports that focused on health care quality issues, how to transform the health care system to provide high quality care, and how to implement this vision. The 2001 IOM report, *Crossing the Quality Chasm: A New Health System for the 21st Century,* recommended a multidisciplinary summit to provide strategies for the reformation of health professions education. This summit led to the publication of the 2003 IOM report, *Health Professions Education: A Bridge to Quality,* which recommended integrating a core set of competencies with common, defined terms into health professions education, accreditation, and credentialing processes. The report concluded that "the goal is an outcome-based education system that better prepares clinicians to meet both the needs of patients and the requirements of a changing health system."[63(p.1)]

In keeping with the IOM's recommendations for the improvement of CE and patient care, the Josiah Macy, Jr. Foundation published a report in 2007 that provided suggestions for the advancement of CE, such as emphasizing practice-based, lifelong learning; creating metrics to assess the quality of CE based on process improvement and enhanced patient outcomes; removing commercial support from pharmaceutical or medical device companies; developing a single accreditation organization for both nursing and medicine; and creating an interprofessional CE institute by the IOM.[29]

The IOM responded to the Macy report recommendation for an interprofessional institute by convening a committee to examine CE for health professionals, exploring the development of such an institute, and providing guidance on its establishment and operation.[15] In its report, the IOM suggested the development of a public-private institute devoted to improving continuing professional development (CPD) to foster the delivery of high quality health care. Its recommendations specifically indicated this institute should "coordinate and guide efforts to align approaches in areas of:

    (a) Content and knowledge of CPD among health professions;
    (b) Regulation across States and national CPD providers;
    (c) Financing of CPD to improve professional performance and patient outcomes, and
    (d) Developing and strengthening of a scientific basis for the practice of CPD."[15(p.7)]

The report also addressed the development and analysis of process and outcome metrics unique to CPD; collaboration among stakeholders to evaluate changes in the performance of health professionals; the need for CPD in the improvement of patient care and safety; and transparency to the public about the performance of health care professionals.[15]

The American College of Chest Physicians (ACCP) also published evidence-based educational guidelines for continuing medical education (CME).[168-172] The authors emphasized the use of CME to improve physician knowledge[169] and the application of knowledge to improve practice performance and clinical outcomes.[171] In general, the use of multiple media, multiple instructional techniques, and multiple exposures to CME were preferred for most domains assessed.[168-170] The guidelines also suggested, "standardized definitions, methods, and reporting structures be developed and used for future research, systematic reviews, and guidelines."[172(p.95)] Finally, the authors suggested that leaders in the field of medical education identify high priority research topics and conduct scientifically rigorous studies of the process and effectiveness of CME.[172] However, Norman cautioned that the "medium is not the message" and that "educational technique matters much more." The author also contended that "knowledge counts," "CME can improve knowledge and application of knowledge," and "pursuing more distant outcomes, such as patient outcomes, amounts to looking in bigger and bigger haystacks for smaller and smaller needles."[173(p.836-837)]

The American Association of Colleges of Nursing (AACN) and the Association of American Medical Colleges (AAMC) also published recommendations for the future of CE in 2010, which emphasized lifelong learning skills, interprofessional and team-based education and practice, outcomes-based CE methods, and links between health professional education and delivery of care.[18]

A recent report by the Alliance for Continuing Education in the Health Professions (the Alliance) also highlighted the need for CE reform with similar recommendations. It emphasized the importance of aligning CE efforts to national mandates, noting the increasing regulatory requirements for practice relevancy in CE such as Maintenance of Certification and Maintenance of Licensure programs, and supported the evolution of CE from didactic lectures to more practice-based models.[46] The report also acknowledged a "movement toward explicitly designing, developing, and reporting on CE with quality outcomes as the guiding force."[46(p.3)] The Alliance also provided a roadmap for quality improvement education aimed at integrating educators, educational tools, techniques, and resources into health care quality improvement efforts. The roadmap includes numerous recommendations for quality improvement education, particularly the development of a consistent framework to measure and communicate the impact of that education.[46]

In 2013, the IOM convened the Committee on the Learning Health Care System in America to examine the challenges associated with health care in the present day and to provide recommendations on how to achieve a health care system characterized by continuous learning and improvement.[174] Building on earlier IOM reports regarding patient safety, health care quality, and health care disparities, the Committee's recommendations centered on foundational elements, such as digital infrastructure and data; care improvement targets; and a supportive

policy environment. Several recommendations describe strategies that support the previously noted reports, including teaching "new methods for accessing, managing, and applying evidence; engaging in lifelong learning; understanding human behavior and social science; and delivering safe care in an interdisciplinary environment."[174(p.31)] The report also recommends developing a learning consortium to collect and validate lessons learned on how to transform the effectiveness and efficiency of care through continuous improvement programs and initiatives. Additionally, the Committee recommended including the "basic concepts and specialized applications of continuous learning and improvement into health professions education; continuing education; and licensing, certification, and accreditation requirements."[174(p.36)]

Table 4 summarizes key themes and recommendations on improving CE for health professionals from the selected publications discussed above. Development and use of a common language to describe and assess CE along with the need for continued research and evaluation of the most effective CE methods were advocated. Incorporation of more inter-professional education opportunities and development of lifelong learning skills were also emphasized.[46] Overall, a focus on moving toward outcome-based education with development and use of metrics to assess the impact of CE on areas such as quality and patient safety was promoted as an alternative to simply documenting completion of required hours.

Table 4. Reports Focused on Continuing Education for Health Professionals[15,18,29,32,46,63,174]

Recommendations and Supportive Content — Recommendation (blue), Supportive Content (green)	2003 IOM	2007 Macy Foundation	2009 ACCP	2010 IOM	2010 AACN/AAMC	2013 IOM	2015 The Alliance
Conduct Research on CE Methods	Recommendation	Recommendation	Recommendation	Recommendation	Recommendation	Supportive Content	Recommendation
Use Metrics to Assess Effectiveness of CE	Supportive Content	Recommendation	Supportive Content	Recommendation	(blank)	Supportive Content	Recommendation
Incorporate Interprofessional Education	Recommendation	Supportive Content	(blank)	Recommendation	Recommendation	Supportive Content	(blank)
Focus on Outcomes Related to Patient Safety and Quality Improvement	Supportive Content	Supportive Content	Supportive Content	Recommendation	Recommendation	Recommendation	Recommendation
Assess Health Professionals' Competencies	Recommendation	Supportive Content	(blank)	Supportive Content	Supportive Content	Supportive Content	Supportive Content
Use Common Terminology and Definitions in Describing CE	Recommendation	Supportive Content	Recommendation	Recommendation	Supportive Content	Recommendation	Recommendation
Emphasize Lifelong Learning/Continuing Professional Development	Supportive Content	Recommendation	Supportive Content	Recommendation	Recommendation	Supportive Content	Supportive Content
Incorporate Information Technology	Supportive Content	Recommendation	Recommendation	Recommendation	Recommendation	Recommendation	Recommendation

Adapted from Institute of Medicine, 2003; Josiah Macy, Jr. Foundation, 2007; American College of Chest Physicians, 2009; Institute of Medicine, 2013; Alliance for Continuing Education for Health Professionals, 2015.

A recent assessment of the Military Health System (MHS) incorporated recommendations for improvements in continuing education as well. In the *Military Health System Review: Final Report to the Secretary of Defense*, it was noted that all "Service components and the purchased care sector conduct a wide variety of training on quality and performance improvement."[14] However, the authors found significant variation in the conduct and monitoring of quality training, including visibility of completion rates. They conclude that "MHS governance can support performance improvement with better analytics, greater clarity in policy, and aligned training and education programs."[14]

In addition to the need for education and training related to quality, the *Military Health System Review: Final Report to the Secretary of Defense* stated that similar efforts are needed to meet the closely aligned goal of patient safety. The Department of Defense's (DoD's) Patient Safety Program promotes a culture of safety to accelerate the elimination of preventable harm. Among the many goals of the program is a focus on education and enterprise-wide approaches to drive change through implementing evidence-based practices to ensure safe care for all patients. A systems approach is encouraged to create a safer patient environment, and extensive resources are provided through the DoD patient safety website including a Patient Safety Learning Center and eLearning courses.

In response to the *Military Health System Review: Final Report to the Secretary of Defense*, the Secretary of Defense issued a memorandum in October of 2014 calling for the Defense Health Agency (DHA) to establish an MHS performance management system (PMS) to "address the gap in the ability to measure and energize system wide performance."[175] The Secretary of Defense stated that the PMS will be used to monitor MHS-wide core measures and dashboards, as well as system level improvements. The memorandum also directed the MHS to use the principles of high reliability organizations (HROs) as the framework to move the MHS forward in the quality of care and patient safety domains.

Education and training has a recognized role in supporting the transition to becoming a high reliability organization. In describing tools to achieve high reliability in health care, Frankel et al emphasize that personnel should be educated in basic concepts underlying patient safety and reliability, including human factors, system complexity, high reliability, effective communication, and teamwork.[176] They advocate that the "teachable core components" of each of these should "be an integral part of physician credentialing, nursing competencies and new employee orientation" with "consistent thematic content."[176(p.1698)] Baker et al also argue that "teamwork is an essential component of achieving high reliability particularly in health care organizations."[177(p.1576)] The authors describe three strategies to achieve effective teamwork, including selecting individuals with the correct knowledge, skills, and attitudes; enhancing teamwork by modifying the environmental conditions in which teamwork occurs; and developing individual team member competency through training.[177] Wilson et al assert that "By following the science of training and systematically designing and implementing instructional strategies, non-HRTs [high reliability teams] are better able to make the shift to high reliability status."[178(p.307)] Thus, CE is an important component of an overall strategy to achieve high reliability.

CONCLUSION

In the course of this review, a number of opportunities to improve the CE system within the MHS have been identified. If successfully implemented, these initiatives may facilitate more effective and efficient delivery of knowledge and skills transfer, thereby enhancing and maintaining the medical readiness of DoD health professionals. The MHS is uniquely positioned to be a leader in developing a model system of CE for health professionals to support the delivery of high quality care to its beneficiaries. With a large and diverse population base, a comprehensive practice environment, extensive health care expertise, worldwide delivery of care, a mobile workforce, and diverse health professional State licensing and certification requirements, almost every conceivable aspect of CE must be addressed.

The recent creation of the DHA may facilitate a more coordinated effort to develop an integrated system of CE within the MHS. As previously described in Section 2.2, DoD has outlined the functions for the new DHA Education and Training Directorate, including establishing an enterprise-wide eLearning tool, consolidating and streamlining administrative and oversight functions, coordinating professional development and sustainment programs, and facilitating centralized training review.[49,50] A central office for CE with these functions could coordinate and promote the efficient and effective accomplishment of CE goals, including the creation of consistent policies and procedures for CE. This would require significant cooperation among the DHA, Uniformed Services University of the Health Sciences, and the Military Departments, in which appropriate support functions are consolidated within the DHA while not infringing on the role of the Military Departments in training and equipping their forces.

In addition, CE is moving toward outcome-based education, practice-based education, interprofessional education, and the development of appropriate metrics and innovative measurement methods to determine the impact of CE on patient safety and quality. Preparing the workforce with "new skills and 'new ways of relating to patients and each other'[62(p.19)] demands both retraining of the current health professions workforce and interprofessional learning approaches for preparing future health care practitioners."[179(p.4)] As the MHS strives to become an HRO, providing aligned education and training on high reliability, quality, and patient safety will be important to realizing those efforts.

The Board strongly supports several MHS CE initiatives in progress and has suggestions for several others. One specific enhancement would be the creation of a single MHS online portal as an efficient gateway to CE resources and policy. Consolidation of administrative and support activities, along with the plan to adopt a single learning management system, all accessible through a single portal, would provide an opportunity to improve the capability to plan, track, deliver, and assess the effectiveness of CE within the MHS. This would also provide one mechanism to assist in assessing the impact of CE on performance outcomes, such as patient safety and health care quality, by correlating CE completion rates with trends in related outcomes. MHS efforts to adopt a core set of access, quality, and patient safety metrics, as recommended in the *Military Health System Review: Final Report to the Secretary of Defense,* will provide health leadership better tools to assess the impact of interventions on these outcome measures. Using these metrics as part of a feedback loop to evaluate the performance of the health system and the health professionals within that system could also promote prioritization of more effective education and training opportunities for health professionals. Additionally, needs

assessments may help determine knowledge gaps, medical readiness training requirements, and may provide a basis for more effective CE programs.

Many health professional organizations have annual in-person CE conferences and meetings, and several publications have endorsed the value of participating in professional conferences and meetings. Participating in these activities provides numerous benefits to both the civilian and military health communities, as well as individual DoD health professionals. Thus, DoD should continue to provide the opportunity for MHS professionals to participate in professional conferences and meetings to the greatest extent possible on a prioritized basis. DoD has an obligation to share advancements in areas of benefit to civilian practice while also interacting with and assimilating best practices from their civilian counterparts. Funding for CE will fluctuate relative to the overall budget. It is important to have a structured approach to adapt and ensure the most critical components of CE are accomplished during the financially lean years. Therefore, DoD health professionals should develop and continually refine professional development plans including required and desired multi-year CE milestones, with contingency plans to accomplish the most important goals at little or no cost.

As stated in the 2013 IOM report, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America,* "A health care system that gains from continuous learning is a system that can provide Americans with superior care at lower cost."[174(p.x)] A 2008 *Harvard Business Review* article asserted, "the best organizations have figured out how to learn quickly while maintaining high quality standards."[180] With the recent creation of the PMS, DoD has taken positive steps toward improving health professionals' health care practices as well as access to care, quality of care, and patient safety.[175] Thus, as the MHS strives to become an HRO, it should also strive to adopt and maintain the principles of a continuous learning organization to provide excellent, cost-effective care in which CE is deemed an integral component.

References
14.	U.S. Department of Defense. *Military Health System Review: Final Report to the Secretary of Defense.* Washington, DC 2014.
15.	Committee on Planning a Continuing Health Professional Education Institute, Board of Health Care Services, Institute of Medicine. *Redesigning continuing education in the health professions.* Washington, DC: National Academies Press 2010.
18.	Association of American Medical Colleges, American Association of Colleges of Nursing. Lifelong learning in medicine and nursing, final conference report. 2010; Washington, DC.
29.	Continuing education in the health professions: Improving healthcare through lifelong learning, proceedings of a conference sponsored by the Josiah Macy, Jr. Foundation. 2007; New York, New York.
32.	Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: Effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):69s-75s.
46.	Diamond L, Kues J, Sulkes D. *The Quality Improvement Education Roadmap: A Pathway to Our Future.* Alliance for Continuing Education in the Health Professions;2015.
49.	Education and Training [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training. Accessed September 29, 2014.

50. Wright J. Response to Congressional Defense Committees, Third Submission under Section 731 of the National Defense Authorization Act for Fiscal Year 2013, Plan for Reform of the Administration of the Military Health System. Washington, DC: Under Secretary of Defense for Personnel and Readiness; 2013.

62. Committee on Quality Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century.* Washington, DC: National Academies Press;2001.

63. Committee on the Health Professions Education Summit. *Health Professions Education: A Bridge to Quality.* Washington, DC: National Academies Press;2003.

168. O'Neil KM, Addrizzo-Harris DJ. Continuing medical education effect on physician knowledge application and psychomotor skills: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):37s-41s.

169. Bordage G, Carlin B, Mazmanian PE. Continuing medical education effect on physician knowledge: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):29s-36s.

170. Davis D, Galbraith R. Continuing medical education effect on practice performance: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):42s-48s.

171. Mazmanian PE, Davis DA, Galbraith R. Continuing medical education effect on clinical outcomes: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):49s-55s.

172. Davis D, Bordage G, Moores LK, et al. The science of continuing medical education: terms, tools, and gaps: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):8s-16s.

173. Norman G. The American College of Chest Physicians evidence-based educational guidelines for continuing medical education interventions: a critical review of evidence-based educational guidelines. *Chest.* Mar 2009;135(3):834-837.

174. Institute of Medicine. *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America.* Washington, DC: The National Academies Press;2013.

175. Hagel C. Military Health System Action Plan for Access, Quality of Care, and Patient Safety. In: Defense Do, ed. Washington, DC: Office of the Secretary of Defense; 2014.

176. Frankel AS, Leonard MW, Denham CR. Fair and Just Culture, Team Behavior, and Leadership Engagement: The Tools to Achieve High Reliability. *Health Serv. Res.* 2006;41(4 Pt 2):1690-1709.

177. Baker DP, Day R, Salas E. Teamwork as an Essential Component of High-Reliability Organizations. *Health Serv. Res.* 2006;41(4 Pt 2):1576-1598.

178. Wilson K, Burke C, Priest H, Salas E. Promoting health care safety through training high reliability teams. *Qual. Saf. Health Care.* 2005;14(4):303-309.

179. Interprofessional Education Collaborative Expert Panel. *Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel.* Washington, DC: Interprofessional Education Collaborative;2011.

180. Edmondson AC. The competitive imperative of learning. *Harv. Bus. Rev.* Jul-Aug 2008;86(7-8):60-67, 160.

REPORT REFERENCES

1. U.S. Government Accountability Office. *Electronic Health Records: VA and DOD Need to Support Cost and Schedule Claims, Develop Interoperability Plans, and Improve Collaboration.* Washington, DC; 2014. GAO-14-302.

2. U.S. Department of Defense. *United States Department of Defense Fiscal Year 2015 Budget Request Overview.* Washington, DC: Office of the Under Secretary of Defense (Comptroller)/ Chief Financial Officer;2014.

3. U.S. Department of Defense. *The Military Health System Strategic Plan: A Roadmap for Medical Transformation.* Washington, DC 2007.

4. Hosek SD, Cecchine G. Medical Readiness and Operational Medicine. *Reorganizing the Military Health System: Should There Be a Joint Command?* Santa Monica, CA: RAND Corporation 2002:43-55.

5. U.S. Department of Defense. Medical Readiness Training. In: U.S. Department of Defense, ed. *Department of Defense Instruction 1322.24*. Washington, DC 2011.

6. Lew J. Eliminating Excess Conference Spending and Promoting Efficiency in Government. In: Executive Office of the President Office of Management and Budget, ed. Washington, DC 2011.

7. The White House Office of the Press Secretary. Executive Order 13589: Promoting Efficient Spending. Washington, DC 2011.

8. Zients Z. Promoting Efficient Spending to Support Agency Operations. In: Executive Office of the President Office of Management and Budget, ed. Washington, DC 2012.

9. Carter A. Implementation of Conference Oversight Requirements and Delegation of Conference Approval Authority. In: Deputy Secretary of Defense, ed. Washington, DC 2012.

10. McGrath E. Implementation of Updated Conference Oversight Requirements. In: Deputy Chief Management Officer, ed. Washington, DC 2013.

11. O'Keefe E. GSA Vegas scandal prompts bills that would gut spending on federal agency conferences [Web page]. 2012. http://www.washingtonpost.com/blogs/2chambers/post/bills-curbing-federal-agency-conference-introduced/2012/04/20/gIQASexaVT_blog.html.

12. U.S. Government Accountability Office. *Defense Science and Technology: Further DOD and DOE Actions Needed to Provide Timely Conference Decisions and Analyze Risks from Changes in Participation.* Washington, DC 2015.

13. Schilling L, Dearing J, Staley P, Harvey P, Fahey L, Kuruppa F. Kaiser Permanente's performance improvement system, part 4: Creating a learning organization. *The Joint Commission Journal on Quality and Patient Safety.* 2011;37(12):544-552.

14. U.S. Department of Defense. *Military Health System Review: Final Report to the Secretary of Defense.* Washington, DC 2014.

15. Committee on Planning a Continuing Health Professional Education Institute, Board of Health Care Services, Institute of Medicine. *Redesigning continuing education in the health professions.* Washington, DC: National Academies Press 2010.

16. U.S. Government Accountability Office. *Defense Health Care Reform: Actions Needed to Help Realize Potential Cost Savings from Medical Education and Training.* Washington, DC 2014.

17. U.S. Government Accountability Office. *Defense Health Care Reform: Actions Needed to Help Ensure Defense Health Agency Maintains Implementation Progress.* Washington, DC 2015.

18. Association of American Medical Colleges, American Association of Colleges of Nursing. Lifelong learning in medicine and nursing, final conference report. 2010; Washington, DC.

19. American Nurses Credentialing Center. *The Importance of Evaluating the Impact of Continuing Nursing Education on Outcomes: Professional Nursing Practice and Patient Care.* 2014. http://www.nursecredentialing.org/Accreditation/ResourcesServices/Evaluating-the-Impact-CNE-Outcomes.pdf. Accessed June 12, 2015.

20.   U.S. Department of the Army. Professional Education and Training Programs of the Army Medical Department. In: U.S. Department of the Army, ed. *Army Regulation 351-3*. Washington, DC 2007.

21.   U.S. Department of the Air Force. Professional Board and National Certification Examinations. In: U.S. Department of the Air Force, ed. *Air Force Instruction 41-104*. Washington, DC 2014.

22.   U.S. Department of the Navy. Policies and Procedures for Funding Professional Credentials and Certification Examinations. In: U.S. Department of the Navy, ed. *BUMED Instruction 1500.20*. Washington, DC 2014.

23.   Federation of State Medical Boards. *Continuing Medical Education, Board by Board Overview*. Federation of State Medical Boards; 2014. http://www.fsmb.org/Media/Default/PDF/FSMB/Advocacy/GRPOL_CME_Overview_by_State.pdf. Accessed July 31, 2014.

24.   Federation of State Medical Boards. State-specific requirements for initial medical licensure [Web page]. 2014; http://www.fsmb.org/policy/public-resources/state_specific. Accessed April 13, 2015.

25.   National Council of State Boards of Nursing. *State and Territorial Boards of Nursing: What Every Nurse Needs to Know.* 2011. https://www.ncsbn.org/What_Every_Nurse_Needs_to_Know.pdf. Accessed April 13, 2015.

26.   American Academy of Physicians Assistants. Statutory and regulatory requirements for licensure and license renewal [Web page]. https://www.aapa.org/WorkArea/DownloadAsset.aspx?id=599

27.   Work R. Update DoD Conference Guidance. Washington, DC 2015.

28.   Defense Health Agency. Learning management systems migration [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training/Learning-Management-Systems-Migration. Accessed April 20, 2015.

29.   Continuing education in the health professions: Improving healthcare through lifelong learning, proceedings of a conference sponsored by the Josiah Macy, Jr. Foundation. 2007; New York, New York.

30.   Health Professions Network Nursing and Midwifery Office. *Framework for Action on Interprofessional Education & Collaborative Practice.* Geneva, Switzerland: World Health Organization;2010.

31.   Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: Effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst. Rev.* 2013;3:CD002213.

32.   Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: Effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):69s-75s.

33.   Elkin PL, Gorman PN. Continuing medical education and patient safety: An agenda for lifelong learning. *Journal of the American Medical Informatics Association: JAMIA.* Nov-Dec 2002;9(6 Suppl 1):s128-s132.

34.   Association of American Medical Colleges. Faculty development resources: quality improvement and patient safety [Web page]. https://www.aamc.org/initiatives/cei/te4q/267686/general.html. Accessed July 25, 2015.

35.   American Nurses Credentialing Center. *Continuing Education Research Studies.* 2013. http://www.nursecredentialing.org/Documents/Accreditation/CE-ReferencesTable.pdf. Accessed July 25, 2015.

36.   U.S. Department of Defense Inspector General. *Medical Readiness Training for Reserve Physicians.* Arlington, VA: U.S. Department of Defense Inspector General;1996.

37.   U.S. General Accounting Office. *Medical Readiness Training: Limited Participation by Army Medical Personnel.* Washington, DC 1993.

38.   U.S. General Accounting Office. *Operation DESERT STORM: Full Army Medical Capability Not Achieved.* Washington, DC 1992.

39. U.S. General Accounting Office. *Operation DESERT STORM: Improvements Required in the Navy's Wartime Medical Care Program.* Washington, DC 1993.

40. U.S. General Accounting Office. *Operation DESERT STORM: Problems with Air Force Medical Readiness.* Washington, DC 1993.

41. Office of the Air Force Materiel Command Surgeon. Concept of Operations (CONOPS) for Sustained Medical and Readiness Trained (SMART). 2015.

42. Manning G. Self-directed learning: A key component of adult learning theory. *Journal of the Washington Institute of China Studies.* 2007;2(2).

43. Moja L, Kwag KH. Point of care information services: A platform for self-directed continuing medical education for front line decision makers. *Postgrad. Med. J.* Feb 2015;91(1072):83-91.

44. Mehta N, Geissel K, Rhodes E, Salinas G. Comparative effectiveness in CME: Evaluation of personalized and self-directed learning models. *J. Contin. Educ. Health Prof.* Spring 2015;35 Suppl 1:S24-26.

45. Li ST, Paterniti DA, Co JP, West DC. Successful self-directed lifelong learning in medicine: A conceptual model derived from qualitative analysis of a national survey of pediatric residents. *Acad. Med.* Jul 2010;85(7):1229-1236.

46. Diamond L, Kues J, Sulkes D. *The Quality Improvement Education Roadmap: A Pathway to Our Future.* Alliance for Continuing Education in the Health Professions;2015.

47. Kirby S, Marsh J, J. M, Thie H, Xia N, Sollinger J. *Developing Military Health Care Leaders Insights from the Military, Civilian, and Government Sectors.* RAND Center for Military Health Policy Research;2011.

48. North Shore Long Island Jewish Health System. *Fostering Corporate Growth and Change Through Life Long Learning.* Northport, NY: Onward Publishing, Inc.

49. Education and Training [Web page]. http://www.health.mil/About-MHS/Defense-Health-Agency/Education-and-Training. Accessed September 29, 2014.

50. Wright J. Response to Congressional Defense Committees, Third Submission under Section 731 of the National Defense Authorization Act for Fiscal Year 2013, Plan for Reform of the Administration of the Military Health System. Washington, DC: Under Secretary of Defense for Personnel and Readiness; 2013.

51. Logan JI. *Medicine in Quotations: Views of Health and Disease Through the Ages.* Second ed. Philadelphia, PA: American College of Physicians; 2006.

52. Melnyk BM, Fineout-Overholt E, eds. *Evidence-based Practice in Nursing & Healthcare: a Guide to Best Practice.* Lippincott Williams & Watkins; 2011.

53. Grasser K. Military medicine: a history of innovation. *Phoenix Patriot.* 2012.

54. Congressional Budget Office. *Approaches to Reducing Federal Spending on Military Health Care.* Washington, DC: Congress of the United States;2014.

55. American Medical Association. *The Physician's Recognition Award and Credit System.* American Medical Association;2010.

56. American Osteopathic Association. Continuing medical education [Web page]. 2014; http://www.osteopathic.org/inside-aoa/development/continuing-medical-education/Pages/default.aspx. Accessed May 29, 2014.

57. American Psychological Association. Office of continuing education in psychology [Web page]. 2014; http://www.apa.org/ed/ce/index.aspx. Accessed May 29, 2014.

58. American Public Health Association. Continuing education at the APHA annual meeting [Web page]. 2014; http://www.apha.org/professional-development/continuing-education/continuing-education-at-the-annual-meeting. Accessed May 29, 2014.

59. American Academy of Physician Assistants. New NCCPA certification maintenance requirements [Web page]. http://www.aapa.org/threecolumnlanding.aspx?id=1298. Accessed May 29, 2014.

60. American Pharmacists Association. Learn [Web page]. 2014; http://www.pharmacist.com/node/26541. Accessed May 29, 2014.

61. American Nurses Association. About us [Web page]. 2011; http://ananursece.healthstream.com/pages/about.aspx. Accessed May 29, 2014.

62. Committee on Quality Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century.* Washington, DC: National Academies Press;2001.

63. Committee on the Health Professions Education Summit. *Health Professions Education: A Bridge to Quality.* Washington, DC: National Academies Press;2003.

64. American Association of Colleges of Nursing and the Association of American Medical Colleges. *Lifelong Learning in Medicine and Nursing: Final Conference Report.* Washington, DC: American Association of Colleges of Nursing;2010.

65. Continuing education, professional development, and lifelong learning for the 21st century health care workforce. *11th Annual Report to the Secretary of Health and Human Services and the U.S. Congress*: Advisory Committee on Interdisciplinary Community-Based Linkages; 2011.

66. Jha AK, Orav EJ, Epstein AM. Low-quality, high-cost hospitals, mainly in south, care for sharply higher shares of elderly black, hispanic, and medicaid patients. *Health Aff. (Millwood).* 2011;30(10):1904-1911.

67. Chen LM, Jha AK, Guterman S, Ridgway AB, Orav E, Epstein AM. Hospital cost of care, quality of care, and readmission rates: penny wise and pound foolish? *Arch. Intern. Med.* 2010;170(4):340-346.

68. Hussey PS, Wertheimer S, Mehrotra A. The association between health care quality and cost: a systematic review. *Ann. Intern. Med.* 2013;158(1):27-34.

69. Davis K, Stremikis K, Squires D, Schoen C. *Mirror, Mirror on the Wall, 2014 Update: How the U.S. Health Care System Compares Internationally.* The Commonwealth Fund; June 2014.

70. Sackett DL. *Evidence-based Medicine: How to Practice and Teach EBM.* Churchill Livingstone; 2000.

71. Lewis SJ, Orland BI. The importance and impact of evidence-based medicine. *JMCP.* 2004;10(5):S3-S5.

72. Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. Monthly webinars [Web page]. 2015; http://www.dcoe.mil/Training/Monthly_Webinars.aspx. Accessed July 29, 2015.

73. Continuing education update: announcing new CE provider for patient safety training activities [Web page]. 2015; http://health.mil/News/Articles/2015/04/23/Continuing-Education-Update-Announcing-New-CE-Provider-for-Patient-Safety-Training-Activities. Accessed August 4, 2015.

74. Robb D. *Defense Health Agency Update.* [PowerPoint]. Falls Church, VA;2015.

75. Dorman T. *The Value Proposition of CME.* [PowerPoint]. First Fridays Webinar Series: Medical Education Group (MEG);2011.

76. National Board of Public Health Examiners. About the CPH [Web page]. https://www.nbphe.org/aboutthecph.cfm. Accessed April 8, 2015.

77. Accreditation Council for Continuing Medical Education. *ACCME 2014 Annual Report.* 2015.

78. American Academy of Family Physicians. Contract negotiations: Five elements to consider [Web page]. 2015; http://www.aafp.org/practice-management/payment/contracts.html. Accessed April 8, 2015.

79. American Society of Pediatric Hematology/Oncology. Early career travel stipend award [Web page]. http://aspho.org/career-development/awards/early-career-travel-stipend. Accessed April 8, 2015.

80. Penn State Hershey Pathology and Laboratory Medicine. General information [Web page]. 2013; http://www.pennstatehershey.org/web/pathology/education/residency/manual/general/policies Accessed April 8, 2015

81. Medscape. State CME requirements [Web page]. 2014; http://www.medscape.org/public/staterequirements. Accessed January 30, 2015.

82. Florida Board of Medicine. Renewals, medical doctor - unrestricted [Web page]. 2014; http://flboardofmedicine.gov/renewals/medical-doctor-unrestricted/. Accessed July 28, 2014.

83. Medical Board of California. Physicians and surgeons license renewal [Web page]. 2012; http://www.mbc.ca.gov/Licensees/License_Renewal/Physicians_and_Surgeons.aspx. Accessed July 28, 2014.

84. Florida Board of Nursing. Registered nurse continuing education (CE/CEU) requirements [Web page]. 2015; http://floridasnursing.gov/renewals/registered-nurse-rn/. Accessed January 12, 2015.

85. California Medical Association. *Significant New California Laws of Interest to Physicians for 2015.* 2014. http://www.cmanet.org/files/assets/news/2014/10/new-laws-2015-final-long.pdf. Accessed January 20, 2015.

86. American Nurses Association. *States Which Require Continuing Education for RN Licensure.* 2013. http://www.nursingworld.org/MainMenuCategories/Policy-Advocacy/State/Legislative-Agenda-Reports/NursingEducation/CE-Licensure-Chart.pdf. Accessed January 20, 2015.

87. Association of State and Provincial Psychology Boards. *Continuing Education Requirements by Jurisdiction.* http://www.asppb.org/HandbookPublic/Reports/default.aspx?ReportType=ContinuingEducation. Accessed January 20, 2015.

88. American Board of Medical Specialties. *ABMS Member Boards Part IV Requirements.* 2013. http://www.abms.org/Maintenance_of_Certification/competencies_pdf/ABMS_MemberBoardsRequirementsProject_MOC_PartIV_FINAL.pdf. Accessed July 31, 2014.

89. Undersecretary of Defense for Personnel and Readiness. Medical Quality Assurance (MQA) and Clinical Quality Management in the Military Health System (MHS). In: Department of Defense, ed2013.

90. Office of the Army Surgeon General. MEDCOM Guidance for Implementation of Army Directive 2014-02 (Army Conference Policy). In: U.S. Army, ed. Fort Sam Houston, Texas 2014.

91. Poland GA. DoD Conference Attendance. In: Rouse D, ed2015.

92. Office of the Deputy Chief Management Officer. DoD-Hosted Conference Annual Reports. http://dcmo.defense.gov/products-and-services/conference-policies-controls/annual-reports.html. Accessed June 5, 2015.

93. Clark J. Conference Attendance Policy. In: Defense Health Agency, ed. Walter Reed National Military Medical Center 2015.

94. U.S. Department of Defense. U.S. Army Command continuing medical education [Web page]. http://health.mil/Training-Center/US-Army-Command-Continuing-Medical-Education. Accessed June 4, 2015.

95. U.S. Army Medical Department. Center for Professional Education and Training [Web page]. 2013; http://www.cs.amedd.army.mil/portlet.aspx?id=4ac06b51-6b3e-4ab4-91c5-0e4120193c01. Accessed June 11, 2015.

96. U.S. Navy. Continuing medical education (CME) mission statement [Web page]. 2010; http://www.med.navy.mil/sites/nmpdc/professional-development/SitePages/Continuing%20Medical%20Education.aspx. Accessed June 4, 2015.

97. U.S. Navy Bureau of Medicine and Surgery. Continuing health education [Web page]. http://www.med.navy.mil/sites/nmpdc/professional-development/SitePages/Continuing%20Health%20Education.aspx Accessed June 11, 2015.

98. U.S. Air Force. Air Force Physician Education Branch [Web page]. http://www.airforcemedicine.af.mil/physicianeducationbranch/. Accessed June 4, 2015.

99. Payment of Expenses to Obtain Professional Credentials, 10 U.S.C. 2015. 2012.

100. The Joint Commission. *Primary Source Verification.* 2008. http://www.jointcommission.org/mobile/standards_information/jcfaqdetails.aspx?StandardsFAQId=241&StandardsFAQChapterId=5. Accessed August 5, 2014.

101. American Public Health Association. Annual meeting & exposition [Web page]. http://www.apha.org/meetings/annual/. Accessed September 18, 2014.

102. American Dental Association. ADA 2014 America's dental meeting [Web page]. http://www.ada.org/en/meeting/attendee-information/. Accessed September 19, 2014.

103. U.S. Army Medical Research and Materiel Command. CME activity details [Web page]. http://mhsrs.com/cme/activity-details. Accessed September 15, 2014.

104. The Society of Federal Health Professionals. About AMSUS [Web page]. 2014; http://www.amsus.org/about-amsus/. Accessed September 29, 2014.

105. MedicineNet. Definition of grand rounds [Web page]. 2012; http://www.medicinenet.com/script/main/art.asp?articlekey=40370. Accessed July 27, 2015.

106. Holy Cross Health. Grand rounds schedule [Web page]. 2015; http://www.holycrosshealth.org/grand-rounds-schedule Accessed July 27, 2015.

107. Curtis MT, DiazGranados D, Feldman M. Judicious use of simulation technology in continuing medical education. *The Journal of Continuing Education in the Health Professions.* Fall 2012;32(4):255-260.

108. Uniformed Services University of the Health Sciences. About us [Web page]. 2014; http://simcen.usuhs.edu/aboutus/Pages/default.aspx Accessed June 24, 2015.

109. McGaghie WC, Siddall VJ, Mazmanian PE, Myers J. Lessons for continuing medical education from simulation research in undergraduate and graduate medical education: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):62s-68s.

110. American Nurses Association. Continuing professional development [Web page]. http://www.nursingworld.org/MainMenuCategories/CertificationandAccreditation/Continuing-Professional-Development. Accessed September 29, 2014.

111. Joint Medical Executive Skills Institute. About JMESI [Web page]. 2012; https://jmesi.army.mil/. Accessed September 29, 2014.

112. Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. Monthly webinars [Web page]. 2015; http://www.dcoe.mil/Training/Monthly_Webinars.aspx. Accessed September 29, 2014.

113. American Academy of Family Physicians. Member CME requirements [Web page]. http://www.aafp.org/about/membership/cme-requirements.html Accessed July 15, 2015.

114. American Nurses Credentialing Center. ANCC Annual Symposim on Continuing Nursing Education [Web page]. http://www.nursecredentialing.org/CNE-Symposium. Accessed September 29, 2014.

115. American Nurses Credentialing Center. Nursing education gets flipped at the ANCC Annual Symposium on Continuing Nursing Education [Web page]. http://www.nursecredentialing.org/FunctionalCategory/AboutANCC/Headlines/ANCCFlippedEducationSymposium.html. Accessed December 15, 2014.

116. Hollands FM, Tirthali D. *MOOCs: Expectations and Reality*. Teachers College: Center for Benefit-Cost Studies of Education, Columbia University; 2014.

117. Liyanagunawardena TR, Williams SA. Massive open online courses on health and medicine: review. *J. Med. Internet Res.* 2014;16(8):e191.

118. The Alliance for Continuing Education in the Health Professions. Alliance issues call for Comments on its Quality Improvement Education Roadmap. Baltimore, MD.

119. The Johns Hopkins University. *Effectiveness of Continuing Medical Education.* Rockville, MD: Agency for Healthcare Research and Quality;2007.

120. Forsetlund L, Bjorndal A, Rashidian A, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes (Review). *The Cochrane Library.* 2012(11).

121. Davis D, O'Brien M, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional

continuing education activities change physician behavior or health care outcomes? *JAMA.* 1999;282(9):867-874.

122.   Leung CP, Klausner AP, Habibi JR, King AB, Feldman A. Audience response system: a new learning tool for urologic conferences. *The Canadian journal of urology.* Dec 2013;20(6):7042-7045.

123.   Stanford Center for Immersive and Simulation-based Learning. Simulation Modalities. 2015; http://cisl.stanford.edu/what_is/sim_modalities/. Accessed June 24, 2015.

124.   McGaghie WC, Issenberg SB, Cohen ER, Barsuk JH, Wayne DB. Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. *Acad. Med.* Jun 2011;86(6):706-711.

125.   Cook DA, Brydges R, Hamstra SJ, et al. Comparative effectiveness of technology-enhanced simulation versus other instructional methods: a systematic review and meta-analysis. *Simulation in healthcare : journal of the Society for Simulation in Healthcare.* Oct 2012;7(5):308-320.

126.   Cook DA, Erwin PJ, Triola MM. Computerized virtual patients in health professions education: a systematic review and meta-analysis. *Acad. Med.* Oct 2010;85(10):1589-1602.

127.   Cook DA. The Literature on Health Care Simulation Education: What Does It Show? *Perspectives on Safety.* 2013.

128.   Barry Issenberg S, Mcgaghie WC, Petrusa ER, Lee Gordon D, Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med. Teach.* 2005;27(1):10-28.

129.   Norman G, Dore K, Grierson L. The minimal relationship between simulation fidelity and transfer of learning. *Med. Educ.* Jul 2012;46(7):636-647.

130.   Wutoh R, Boren SA, Balas EA. eLearning: A review of internet-based continuing medical education. *J. Contin. Educ. Health Prof.* 2004;24(1):20-30.

131.   Interprofessional Education Collaborative. What is Interprofessional Education? 2015; https://ipecollaborative.org/About_IPEC.html. Accessed May 29, 2015.

132.   Health Resources and Services Administration. Interprofessional Education. http://bhpr.hrsa.gov/grants/interprofessional/. Accessed May 29, 2015.

133.   Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA.* Sep 6 2006;296(9):1094-1102.

134.   Parker K, Parikh SV. Applying Prochaska's model of change to needs assessment, programme planning and outcome measurement. *J. Eval. Clin. Pract.* Nov 2001;7(4):365-371.

135.   Bird GC, Marian K, Bagley B. Effect of a performance improvement CME activity on management of patients with diabetes. *J. Contin. Educ. Health Prof.* Summer 2013;33(3):155-163.

136.   Joyner J, Moore MA, Simmons DR, et al. Impact of performance improvement continuing medical education on cardiometabolic risk factor control: the COSEHC initiative. *J. Contin. Educ. Health Prof.* Winter 2014;34(1):25-36.

137.   US. Army Institute of Surgical Research. Joint Trauma System. http://www.usaisr.amedd.army.mil/10_jts.html. Accessed August 11, 2015.

138.   U.S. Army Medical Research and Materiel Command. Combat Casualty Care Research Program. 2015; https://ccc.amedd.army.mil/Pages/default.aspx. Accessed August 11, 2015.

139.   Joint Chiefs of Staff. Joint Concept for Health Services. Washington, DC 2015.

140.   American Organization of Nurse Executives, Nurses AAoC-C. Nurse Manager Skills Inventory. 2006.

141.   U.S. Department of Veterans Affairs. MyCareer@VA. 2013; http://www.mycareeratva.va.gov/library/54 Accessed April 20, 2015.

142.   U.S. Department of Veterans Affairs. Education Support. 2014; http://www.vacareers.va.gov/why-choose-va/education-support.asp. Accessed April 20, 2105.

143. American Board of Medical Specialties. Based on Core Competencies. *Board Certification* http://www.abms.org/board-certification/a-trusted-credential/based-on-core-competencies/. Accessed January 14, 2015.

144. Teirstein PS. Boarded to Death — Why Maintenance of Certification Is Bad for Doctors and Patients. *N. Engl. J. Med.* 2015;372(2):106-108.

145. American Board of Medical Specialties. Steps Towards Initial Certification and MOC. *Board Certification* http://www.abms.org/board-certification/steps-toward-initial-certification-and-moc/. Accessed January 14, 2015.

146. American Osteopathic Association. Osteopathic Continuous Certification. http://www.osteopathic.org/inside-aoa/development/aoa-board-certification/Pages/osteopathic-continuous-certification.aspx Accessed April 20, 2015.

147. Federation of State Medical Boards. Maintenance of Licensure (MOL) frequently asked questions [Web page]. 2015; http://www.fsmb.org/fsmb-mol/mol-faq. Accessed September 23, 2015.

148. Bendix JM. MOC: An Examination of Costs and Impact to Physicians. 2014; http://medicaleconomics.modernmedicine.com/medical-economics/content/tags/abms/moc-examination-costs-and-impact-physicians?page=full. Accessed April 20, 2015.

149. Iglehart JK, Baron RB. Ensuring Physicians' Competence — Is Maintenance of Certification the Answer? *N. Engl. J. Med.* 2012;367(26):2543-2549.

150. Haynes AB, Weiser TG, Berry WR, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *N. Engl. J. Med.* 2009;360(5):491-499.

151. Joint Accreditation. Joint Accreditation for Interprofessional Continuing Education. http://www.jointaccreditation.org/. Accessed September 29, 2014.

152. Basu S. Conference cancellations push DoD, VA clinicians to find other CME sources 2013; http://www.usmedicine.com/agencies/department-of-defense-dod/conference-cancellations-push-dod-va-clinicians-to-find-other-cme-sources/. Accessed March 20, 2015.

153. U.S. Office of Management and Budget. Controller Alert: Travel and Conferences. 2013

154. U.S. Office of Management and Budget. Controller Alert: Travel and Conferences   2015

155. The Judge Advocate General's Legal Center and School. Chapter H: Gifts. *Twelfth Ethics Counselor's Course Deskbook*2014.

156. Acceptance of Travel and Related Expenses from Non-Federal Sources ,31 U.S.C. §1353. 2012.

157. Payment of Travel Expenses from a Non-Federal Source, 41 C.F.R. Chapter 304. 2012.

158. The Per Diem TaTACoAS. The Joint Travel Regulations: Uniformed Service Members and DOD Civilian Employees. In: Defense USDo, ed. Alexandria, VA2014.

159. Responsibilities of Agency Head, 5 C.F.R 2638.202. 2008.

160. Raloff J. Weighing the Costs of Conferencing. 2012; https://www.sciencenews.org/blog/science-public/weighing-costs-conferencing. Accessed June 3, 2015.

161. Ward K. The Importance of Attending Nursing Conferences. 2013; http://www.nursingexaminer.com/nursing-education/nursing-conferences/. Accessed June 3, 2015.

162. Committee on Globalization of Science and Technology: Opportunities and Challenges for the Department of Defense, Board on Global Science and Technology Policy and Global Affairs, National Research Council. *Strategic Engagement in S&T: Opportunities for Defense Research.* Washington, DC2014.

163. Ioannidis JA. ARe medical conferences useful? and for whom? *JAMA.* 2012;307(12):1257-1258.

164. Drife JO. Are international conferences an outdated luxury the planet can't afford? No. *BMJ.* 2008;336.

165. Murphy SE, Ensher EA. The Role of Mentoring Support and Self-Management Strategies on Reported Career Outcomes. *Journal of Career Development.* 2001/06/01 2001;27(4):229-246.

166. Loyd J. Emergency tourniquets, war lessons saved lives in Boston. 2013; http://www.usatoday.com/story/news/nation/2013/04/17/tourniquets-emergency-boston/2091079/. Accessed January 16, 2015.

167. U.S. Navy Bureau of Medicine and Surgery. Continuing Education (CE), Professional Update Training (PUT) and Alternative Instructional Systems (AIS) for Medical Department Personnel. In: Navy Dot, ed. Washington, DC2008.

168. O'Neil KM, Addrizzo-Harris DJ. Continuing medical education effect on physician knowledge application and psychomotor skills: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):37s-41s.

169. Bordage G, Carlin B, Mazmanian PE. Continuing medical education effect on physician knowledge: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):29s-36s.

170. Davis D, Galbraith R. Continuing medical education effect on practice performance: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):42s-48s.

171. Mazmanian PE, Davis DA, Galbraith R. Continuing medical education effect on clinical outcomes: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):49s-55s.

172. Davis D, Bordage G, Moores LK, et al. The science of continuing medical education: terms, tools, and gaps: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* Mar 2009;135(3 Suppl):8s-16s.

173. Norman G. The American College of Chest Physicians evidence-based educational guidelines for continuing medical education interventions: a critical review of evidence-based educational guidelines. *Chest.* Mar 2009;135(3):834-837.

174. Institute of Medicine. *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America.* Washington, DC: The National Academies Press;2013.

175. Hagel C. Military Health System Action Plan for Access, Quality of Care, and Patient Safety. In: Defense Do, ed. Washington, DC: Office of the Secretary of Defense; 2014.

176. Frankel AS, Leonard MW, Denham CR. Fair and Just Culture, Team Behavior, and Leadership Engagement: The Tools to Achieve High Reliability. *Health Serv. Res.* 2006;41(4 Pt 2):1690-1709.

177. Baker DP, Day R, Salas E. Teamwork as an Essential Component of High-Reliability Organizations. *Health Serv. Res.* 2006;41(4 Pt 2):1576-1598.

178. Wilson K, Burke C, Priest H, Salas E. Promoting health care safety through training high reliability teams. *Qual. Saf. Health Care.* 2005;14(4):303-309.

179. Interprofessional Education Collaborative Expert Panel. *Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel.* Washington, DC: Interprofessional Education Collaborative;2011.

180. Edmondson AC. The competitive imperative of learning. *Harv. Bus. Rev.* Jul-Aug 2008;86(7-8):60-67, 160.

APPENDICES

APPENDIX A: LETTER OF REQUEST

UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
READINESS

FEB 25 2013

MEMORANDUM FOR PRESIDENT, DEFENSE HEALTH BOARD

SUBJECT: Request to the Defense Health Board Pertaining to Continuing Health Education for Military and Civilian Health Professionals

The Department of Defense is operating under a severely constrained fiscal environment. Unfortunately, we predict that this situation will continue into the foreseeable future and may even get worse. Consequently, we are looking for solutions to reduce costs while continuing to remain operationally viable.

Within the Military Health System, analyses are ongoing to identify opportunities to reduce costs while preparing staff to provide the best possible care to our beneficiaries. One area we feel may have opportunity for improved efficiency and reduced costs is Continuing Health Education (CHE). We would like the Defense Health Board (DHB) to review the full spectrum of health education options and offer recommendations on how to innovatively reduce training expenditures while ensuring our health professionals continue to meet their annual requirements for proficiency, licensure, and life-long learning.

As you know, we have cancelled our premier annual educational conference for 2013, and our DHB meeting scheduled for March in Tampa, while taking numerous actions to maintain the high quality of military medicine in this stringent environment. We must advise our military and civilian health personnel how to achieve CHE without travelling or with as little travel expenditures as possible. We want to identify innovative methods of providing the required continuing education that is so important to each of our professionals.

We are seeking to define the optimal balance of recurring educational opportunities and experiences for our professionals. Your thoughtful advice and guidance would greatly assist us in this matter. Please provide a response on these items to the Assistant Secretary of Defense for Health Affairs. Thank you for the highly professional and considered work of the Board and for your efforts on this new initiative.

Jessica L Wright
Acting

cc:
Assistant Secretary of Defense for
Health Affairs

APPENDIX B: TERMS OF REFERENCE

These terms of reference establish the objectives for the Defense Health Board's (DHB's) review of strategies to ensure that Department of Defense (DoD) health professionals maintain appropriate and necessary continuing health education (CHE). The terms also outline the scope of the Board's examination as well as its methodology for responding to the Department's request.

Mission Statement: The Board will conduct a comprehensive assessment of the spectrum of continuing health education and offer recommendations on innovations to reduce expenditures while ensuring that military and civilian health professionals continue to meet annual requirements for proficiency, licensure, and lifelong learning.

Issue Statement: DoD is operating in a severely constrained fiscal environment, one that is expected to continue into the foreseeable future. Within the Military Health System, analyses are ongoing to identify opportunities to reduce costs while preparing staff to provide the best possible care to beneficiaries. With recent funding cuts and restrictions pertaining to conferences and travel, it is important to identify innovative methods and means of providing the required CHE for military and civilian health professionals. On February 25, 2013, the Acting Under Secretary of Defense for Personnel and Readiness endorsed a request for the DHB to examine the issue of CHE for military and civilian health professionals and to recommend a strategy for DoD to address this problem.

Objectives and Scope: The Board will address the following aims in its report:

1. Perform a review of the full spectrum of health education options.
2. Offer recommendations on how to innovatively reduce training expenditures while ensuring that health professionals continue to meet their annual requirements for proficiency, licensure, and lifelong learning.
3. Advise on how to achieve CHE without travelling or with as few travel expenditures as possible.
4. Define the optimal balance of recurring educational opportunities and experiences for health professionals.
5. Assess effectiveness of traditional in-person education options compared to emerging non-traditional methods including, for example, distance or online learning.
6. Assess the potential impact of reducing face-to-face interactions, knowing that there are non-measureable components that must be taken into account.

Methodology: A subset of five DHB members will review CHE policies and best practices. As needed members will receive briefings from subject matter experts (SMEs) and DoD personnel involved in CHE efforts. The members will review the literature and information received from briefings, and present their preliminary findings and positions to the DHB for consideration and deliberation. The DHB will deliberate the findings, during which time members may propose recommendations, and vote on those recommendations in an open public session.

Deliverable: The five Board members conducting the primary review will provide a progress update to the Board at a DHB meeting in August 2013. The Board will deliberate the final findings and positions presented by the subset of members in 2015 and produce the final report immediately following for presentation to the Department.

Membership: Five appointed DHB members will comprise the subset of the Board leading the primary investigation and will consult SMEs as needed.

Support:

1.   The DHB office will provide any necessary administrative, analytical/research, and logistical support to the Board.

2.   Funding for this review is included in the DHB operating budget.

APPENDIX C: MEETINGS AND BRIEFINGS

June 11, 2013

On this teleconference, members discussed the tasking and a potential way forward. There were no briefings at this meeting.

October 11, 2013
Bethesda, Maryland

Members met with subject matter experts to discuss continuing education (CE) for Department of Defense (DoD) health professionals at the Uniformed Services University of the Health Sciences (USUHS).

Subject matter experts in attendance included:
- Dr. Charles Rice, President, USUHS
- Dr. Arthur Kellermann, Dean, School of Medicine, USUHS
- Dr. Ada Sue Hinshaw, Dean, Graduate School of Nursing, USUHS
- Dr. Jeffrey Longacre, Vice President for External Affairs, USUHS
- Dr. Dale Smith, Professor and Chair, Department of Medical History, USUHS
- Ms. Patricia Kenney, Special Assistant to the Dean, Graduate School of Nursing, USUHS

February 27, 2014

On this teleconference, members discussed the way ahead and reviewed their Terms of Reference and Guiding Principles. There were no briefings at this meeting.

April 9, 2014

On this teleconference, members discussed CE for health professionals with subject matter experts. Members also reviewed the Terms of Reference, Guiding Principles, and the report outline.

Subject matters in attendance included:
- Dr. Kathleen Geissel, Vice-President Learning Design and Measurement, WebMD Health Corp/Medscape
- Mr. Erik Seim, Director, Government Services, WebMD Health Corp/Medscape

On this teleconference, members also discussed the way ahead and finalized their terms of reference and guiding principles.

June 2, 2014
Swansboro, North Carolina

Members reviewed and edited the draft report and outline. There were no briefings at this meeting.

August 12, 2014
Bethesda, Maryland

Members reviewed and edited the draft report and outline. There were no briefings at this meeting.

September 4, 2014

On this teleconference, members discussed CE for DoD health professionals. Members also discussed additional information potentially needed prior to finalization of the report.

Subject matter experts in attendance included:
- Mr. Cal Baker, U.S. Air Force Continuing Medical Education (CME) Program
- Ms. Lisa Capers, Program Manager, U.S. Army CME Program, Office of the Surgeon General
- Dr. Rosemary Durica, Executive Director, Joint Medical Executive Skills Institute (JMESI)
- Mr. Jesus Lego, U.S. Navy CME
- LTC Christine Lettieri, Deputy Director, U.S. Army CME Program, Office of the Surgeon General
- Mr. Daniel Schladetzky, JMESI
- Mr. Steven Tucker, JMESI
- LCDR Linna Walz, Program Manager, U.S. Navy CME, Continuing Nursing Education (CNE)

October 2, 2014

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

December 17, 2014

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

January 20, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

March 27, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

April 24, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

May 20, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

June 17, 2015

On this teleconference, members reviewed and edited the draft report. Members also received updates on MHS CE activities and initiatives from USUHS, the Medical Education and Training Campus (METC), and the DHA Education and Training Directorate.

Subject matter experts in attendance included:
- Dr. Charles Rice, President, USUHS
- Brig Gen Robert Miller, Commandant, METC/DHA Education and Training Directorate
- Dr. Arthur Kellermann, Dean, School of Medicine, USUHS
- Dr. Carol Romano, Dean, Graduate School of Nursing, USUHS
- Dr. Thomas Schneid, Executive Dean, Postgraduate Dental School, USUHS
- Dr. Brian Reamy, Senior Associate for Academic Affairs, School of Medicine, USUHS
- Ms. Patricia Kenney, Special Assistant to the Dean, Graduate School of Nursing, USUHS
- Mr. Gerald Creech, Chief, Administration, DHA Education and Training Directorate

July 8, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

July 22, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

August 6, 2015

On this teleconference, members reviewed and edited the draft report. There were no briefings at this meeting.

August 21, 2015
Defense Health Board Meeting
Falls Church, Virginia

Dr. Nancy Dickey, Subset chair, presented the deliberative pre-decisional draft of the report. The Board unanimously approved the recommendations with revisions.

APPENDIX D: ACRONYMS

AAMC	Association of American Medical Colleges
AACN	American Association of Colleges of Nursing
AAFP	American Academy of Family Physicians
ABMS	American Board of Medical Specialties
ACCME	Accreditation Council for Continuing Medical Education
ACCP	American College of Chest Physicians
AHRQ	Agency for Healthcare Research and Quality
ANCC	American Nurses Credentialing Center
AOA	American Osteopathic Association
CE	Continuing education
CHE	Continuing health education
C.F.R.	Code of Federal Regulations
CME	Continuing medical education
CNE	Continuing nursing education
CPD	Continuing professional development
DCMO	Deputy Chief Management Officer
DCoE	Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury
DHA	Defense Health Agency
DHB	Defense Health Board
DO	Doctor of Osteopathic Medicine
DoD	Department of Defense
DoDI	Department of Defense Instruction
FSMB	Federation of State Medical Boards
FY	Fiscal Year
GAO	Government Accountability Office/Government Accounting Office
HRO	High reliability organization
HRT	High reliability team
IOM	Institute of Medicine
JKO	Joint Knowledge Online
LMS	Learning management system
MHS	Military Health System
MOC	Maintenance of Certification
MODS	Medical Operational Data System
MOL	Maintenance of Licensure
MOOC	Massive Open Online Courses
MQA	Medical Quality Assurance
MTF	Military treatment facility
NMPDC	Navy Medicine Professional Development Center
OCC	Osteopathic continuous certification
OMB	Office of Management and Budget
PI-CME	Performance improvement – continuing medical education

PMS	Performance management system
PUT	Professional Update Training
USD(P&R)	Under Secretary of Defense for Personnel and Readiness
USUHS	Uniformed Services University of the Health Sciences
VA	Department of Veterans Affairs

APPENDIX E: SUPPORT STAFF

Christine Bader, MS, BSN, RN-BC
Executive Director and Designated Federal Officer, Defense Health Board & Independent Review Panel on Military Medical Construction Standards

Douglas Rouse, Col, USAF, MC, SFS
Executive Secretary, Defense Health Board

Camille Gaviola, MBA
Deputy Director, Defense Health Board & Independent Review Panel on Military Medical Construction Standards

Lisa Austin, MSHA, MBA
Task Lead, Grant Thornton LLP

Sara Higgins MPH
Analyst, Grant Thornton LLP

Ariel Markowitz-Shulman, MS
Analyst, Grant Thornton LLP

Elizabeth Ribeiro, MSPH, CPH
Analyst, Information Innovators, Inc.
(until January 2015)

Kendal Brown, MBA
Management Analyst, Information Innovators, Inc.

Margaret Welsh
Management Analyst, Grant Thornton LLP

Kathi E. Hanna, MS, PhD
Editor, Information Innovators, Inc.

Jean Ward
Defense Health Board Staff Assistant