



ORIGINAL ARTICLE

Innovation in graduate medical education — using a competency based medical education curriculum



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Received 27 September 2015; revised 11 July 2016; accepted 27 July 2016

KEYWORDS

Graduate medical
education;
Learner centered
education;
Competency based
medical education;
Teaching

Abstract Each year the American Centers for Medicare and Medicaid (CMS) pays over 10 billion dollars for graduate medical education in the USA.¹ Up until now there has been lack of evidence based research on the effectiveness of how American osteopathic trainees learn and are taught. An outcomes based delivery system has proven to be an important tool for measuring the status of graduate medical education (GME) in America. Competency based medical education (CBME) has shown to be an important part of the international medical education system. Since the ACGME (American Council on graduate medical education) started measuring the six core competencies over a decade ago, questions have arisen regarding traditional residency training methods and their benefits. Since the Single Accreditation System of the ACGME and AOA (American Osteopathic Association) was put in effect in July 2015, now is the best time for the osteopathic community, both nationally and internationally, to take a look at how we are teaching residents. Within this article, faculty training of residents, reflective practices, and the assessment of professionalism is specifically focused on. It is of utmost importance to research and reevaluate our medical education curriculum so that we will be able to help meet the needs of future generations, while also graduating competent, globally engaged, professional physicians. This article seeks to show the need for innovation in osteopathic GME and the role that competency based medical education (CBME) can play in the osteopathic profession to meet this need.

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Implications for practice

- Instillation and use of a Competency Based Medical Education Curriculum (CBME) is recommended.
- Trainee's competence needs to be defined, focused on, and nurtured.
- GME faculty must working on giving helpful and honest feedback to trainee's.

Introduction

Each year the Centers for Medicare and Medicaid (CMS) pay hospitals and medical systems over 10 billion dollars to support graduate medical education (GME) in the USA.¹ In July 2014, the Institute of Medicine (IOM) released a report of a study suggesting that there was a lack of research and identifying effects on the future of GME.¹ Specifically, this study highlighted the need for a comprehensive look at the way medical schools train their future physicians. Many questions arose from this study, and the need for an outcomes based delivery system for GME was reinforced. An outcomes based delivery system is one where "the quality, distribution, and cost of care" are taken into consideration.¹ A look at the international medical community shows that a competency based education curriculum has been in place for many years. This article seeks to show the benefits of a competency based medical education, both nationally and internationally.

The IOM study showed that there is a need to study the medical education curriculum in America, and to decide which curricula is the best to meet the changing needs of society. The study identified an over abundance of certain specialties, and an over saturation of doctors in parts of the United States.¹ This over saturation needs to be addressed in order for GME to flourish and continue being funded by government agencies. The study also suggested innovation was needed in GME. Some areas where innovation is required include the source and specifics of GME funding, as well as the need for a competency based medical education (CBME) curriculum. Specifically, a competency based medical education program would focus on specific core competencies to enhance the depth and breadth of graduate medical education. "An outcomes-driven approach [to Medical Education has] an added advantage of fostering innovation".¹

Reforming GME

The idea that innovation is encouraged using a competency based medical education system comes from the notion that this system provides a "personalized alternative" approach to learning.² Competency education refers to the move from a traditional time based learning method, which often restricts the learner, to one that allows the learner to participate in lifelong learning and assessment, which is personalized to their goals of mastery in a skill or subject.²

From the July 2014 study, the Institute of Medicine recommended a "transformation fund" to help research ways in which GME can be transformed.¹ Although the osteopathic community has not released an official statement in response, there is an increased need for researching the way the osteopathic community fund and train residents. The "transformation fund" the IOM suggested also seeks to encourage innovation, which has been lacking in GME.

In 2014, the ACGME declared a goal of improving the Clinical Learning Environment of trainees.³ To do this, they started the Clinical Learning Environment Review (CLER) committee.³ This committee visits ACGME approved training institutes every 18–24 months and conducts a survey to assess the resident's clinical environment.³ For example, in 2014, a CLER study showed that GME throughout the USA received the lowest score on its System Based Practice core competency.³ This knowledge may illustrate the need to encourage residents to be able to report mistakes or problems with their training, without the risk of repercussions to their training.

With the Next Accreditation System (NAS), the ACGME mandates programs to submit milestone data from the six core competencies every six months.⁴ The six core competencies of the ACGME are patient care, medical knowledge, practice based learning and improvement, systems based practice, professionalism, interpersonal skills and communication. During the milestone evaluation process, programs are encouraged to focus on trainees' outcomes. There is also a push to seek out innovation during the NAS process.⁴ The NAS was developed to help reduce redundant reviews of programs.⁴

From July 1, 2015 until June 30, 2020, American osteopathic residency programs can apply for accreditation through the Single Accreditation System (SAS). In the memorandum of understanding signed by the leaders of the ACGME and AOA, the SAS was referred to as "the best solution for

trainees, the public, and others”.⁵ A Single Accreditation System will help standardize the quality of GME, and will encourage innovation in medicine. With the start of the SAS, a competency based medical education curriculum can begin at the same time. This curriculum can also be reflected in the milestone data reporting.

Competency based medical education

Internationally, competency based medical education (CBME) has been around for over 60 years. Most research on this type of curriculum references Dr. J. Frank and his studies on a CBME curriculum being an outcomes based method of training.⁶ A competency based medical education (CBME) curriculum deemphasizes training time, and puts focus on trainees’ skill.⁶ It also provides trainees with a well rounded education both in osteopathy and general medical education. Dr. Frank believes this type of training can assess whether graduates of medical education training programs and CBME trainees are able to practice quality medicine.⁶

The history of competency based medical education (CBME) is engrained in the history of the medical profession of Britain. In the UK, the General Medical Council (GMC) uses structure based competency tools and tests to assess primary care physicians in training and out in practice.⁷ This testing system has been utilized for years. A similar system is used in New Zealand and Australia, where a council will also review a physicians’ medical record to make sure written documentation is done correctly.⁷

From a developmental standard, trainees’ abilities develop at different times. With a competency based medical education (CBME) curriculum, the “Learner centeredness encourages trainees to take responsibility for their progress by mapping out a transparent pathway [to competence]”.⁶ This type of educational model also takes into account the fact that different competencies are needed in different geographical areas. If a resident is trained in a location of the USA that is medically underserved, there is a need for training in specific procedures and skills, and that training can be tested and assessed using a CBME model. For example, in the northeast United States, very few family practitioners do colonoscopies. This need may differ in central states of the U.S., where there are few gastroenterologists, and family physicians are encouraged to be competent in this procedure. The same could be said for

family physicians and C-section skill and competency in areas where obstetricians may not be prevalent. A skill and needs assessment of these procedures could be included in a CBME curriculum for these residents and training institutions.

In the United States, the mandates of Maintenance of Licensure and Maintenance of Certification are competency based.⁸ In the American education model, this occurs after the trainee has finished residency, and during their continuing medical education requirements. This certification process includes peer reviews, tests and lifelong learning models. This requirement was enacted to ensure a physicians’ competency throughout their career.⁸ There has been a recent push against standardized testing in medical education, as some research has shown it is not a reliable predictor of how a trainee does on his or her clinical rotation.⁸ Much more emphasis has been placed on competence in a trainee’s communication skills and level of professionalism.

Faculty training in CBME

According to a Dr. Heffron et al., in a competency based medical education (CBME) curriculum the faculty’s role in training a resident is to “create an instructional environment in which trainees’ competencies [are] clearly defined”.⁸ Faculty development is an essential part of competency based training. graduate medical education faculty must be educated on how best to train physicians. For example, faculty must be taught the importance of external feedback as well as internal assessment of a trainees’ performance. Many GME faculty in America state that their biggest problem of giving feedback to the trainees was lack of continuity. If residents are rotating with a hospital based physician for only one or two weeks, it is hard to develop a relationship with that resident and grasp a sense of the resident’s medical knowledge in a limited amount of time.⁹ Continuity with a resident is easier to achieve in an outpatient setting, where the resident spends a greater amount of time with one faculty member and the resident’s continuity with patients can be followed. Some faculty are scared to give negative feedback, while others write negative feedback but give the resident oral positive feedback. “Ultimately, faculty must become less fearful of providing meaningful performance data”.⁹

With competency based medical education (CBME), it is important to train core faculty on how to evaluate a resident. A way to address the

deficiency in the evaluation process is to foster a teamwork mentality amongst the faculty, and to have meetings that address each trainees' progress. During these evaluation meetings, faculty should be able to provide constructive criticism of trainees in a nurturing educational environment; and also be given support and instruction on how to verbally give feedback to the trainees themselves in a way that is constructive and instructional.

Reflective practice of medical education and assessment of skills

A competency based medical education (CBME) curriculum takes into account the process of adult learning. According to Dr. Argyris, adult learning requires "double loop learning" which requires reflection from the learner on how things were done.¹⁰ Adult learners must hold themselves accountable to the outcome, as well as to the journey to get there. The evaluation process in the ACGME core competencies milestones include a self-assessment process where the resident self reflects on his/her progress. Faculty also should be judged on their performance on teaching trainees.⁹ "Clinical competence of faculty is crucial" to competency based medical education.⁹

The Dreyfus model for skill development has been thought to be a crucial learning model within a variety of fields.¹¹ This model illustrates the steps it takes to achieve mastery level in a specific topic. It shows that each trainee may take a different time period to accomplish any one of the steps.¹¹ This model provides great support from the novice level all the way up to the mastery level. Faculty should be taught the Dreyfus model and should also self assess where they are on the pathway of lifelong learning in medicine.

There have been pilot studies done at the medical school level on a competency based medical education (CBME) curriculum. One such study was done at Boston University School of Medicine and was called the MD2000. Medical students participating in this study were required to show proficiency in some standards before graduation.¹² The outcome of this study showed that the students in this program who took the USMLE exams had a slightly higher pass rate than all of the other USMLE students in the country.¹² To date, no data is available for an osteopathic school

using a competency based medical education (CBME) curriculum.

Competency based medical education (CBME) puts into question the emphasis we use on medical education in America as a model of clinical higher education. If, after four years of medical school, and five years of subspecialty postgraduate training, a plastic surgeon limits their practice to collagen fillers, then "why can't individuals be trained to perform these activities without requiring them to graduate from medical school?".¹³ Many skilled procedures are being done by non-physicians, and why should health insurance carriers and consumers pay the fee of a specialist if a procedure can be billed and done by ancillary staff?.¹³ Many procedures that were once done by advanced trained physicians are now being done by non-physicians, with similar results. This brings into question the need for advanced time based training in some specialty. There is also a cost benefit ratio with regards to some skill sets and procedures.

A very important aspect of competency based medical education is self-assessment of the trainee's journey from intern to attending physician. In a CBME curriculum, faculty and trainees must be taught to assess their skill. Research has shown that physicians' self-assessment is different from external assessment of their work.¹⁴ Faculty must be trained in the art of evaluation giving, and each program should make sure their faculty's grading process is reliable. In order for CBME to occur, we need a way to make sure the assessment process is reliable, valid, flexible, comprehensive, feasible, timely, and holds everyone responsible accountable.¹⁵ Part of learning that occurs in CBME is making sure the resident is accountable for their actions. Studies have shown when peer review and group feedback are combined, the evaluation process is improved.¹⁵

Part of the Patient Safety Initiative is to encourage competency in the identification of incompetent physicians, and to avoid possible medical errors. There is controversy as to whether competency training can be tested through multiple-choice question tests.¹⁵ Multiple-choice tests provide a summative assessment of the resident but do not predict performance in the real patient care setting.¹⁵ Formative assessment requires faculty to make sure the resident is exposed to a variety of cases, and that the resident gets experience and variety.¹⁵ Even the MCAT has changed format (2015) to include competencies in social, cultural and psychological sciences.¹⁶

The timing of feedback has also been studied, and real time feedback has been shown to be beneficial in graduate medical education.¹⁵ During the assessment of performance (whether on a real or simulated patient) a resident can understand immediately what went on. A self and faculty assessment of a case immediately after the trainee finishes the case has proven to be beneficial in altering knowledge.¹⁵

Another aspect to competency-based evaluations are that on completion of his or her residency, the resident should have acquired a portfolio of work.¹⁵ This portfolio should include the residents' log, clinical experience, research and presentations, and evaluations. There should also be a chapter for professionalism in the portfolio.

Professionalism in CBME and assessment of professionalism

Professionalism is addressed in every aspect of the competency-based curriculum. An article in *JAMA* in 1907 posed the essential question "and how is it the responsibility of the person who engaged him to be determined for not discriminating [between] a licensed and a competent physician"?.¹⁷ This quote questions the role faculty have in allowing a resident to graduate from a training program if there have been some issues with competence and/or professionalism. In 2014, the Federation of State Medical Boards had to issue citations to over 4000 physicians in the U.S. due to professionalism complaints.¹⁸ The question arises on how to test and make sure a resident understands the importance of professionalism and ethics. Would a standardized, simulated test of professionalism be enough to prove a resident is competent in this core competency?¹⁹

In a physician's journey from resident to attending there is knowledge that comes from personal experience. This 'I know it when I see it' type of knowledge is known as "tacit knowledge, and is not easily taught".²⁰ Intuition and recognizing recurrent themes are essential parts of the medical practice. Professionalism requires critical thinking, applying skill, emotional maturity, and using empathy. Empathy is needed to build professional relationships with patients; residents should constantly be reminded that it is a privilege to practice medicine. There is controversy on whether empathy can be taught or learned.

Residents should have a moral domain and be able to critically self assess their skills. They

should also be aware of when they are impaired, and need to ask for help. When physicians are faced with negative outcomes, oftentimes their first impulse is to hide. As the 2014 CLER study mentioned, residents should be able to report and learn from their mistakes.³ According to the Dreyfus Method, in order for real learning to occur, a trainee must engage their feelings and figure out why mistakes occur in order to avoid them from recurring.^{20,21} According to Dr. Leach's editorial "Competence Is a Habit," "residents must be invoked enough to be accountable".²¹

Internationally, many doctors are tested on their empathy and professionalism skills using simulation. For example, a licensed general practitioner at the Royal College of General Practitioners in the United Kingdom must present videotapes of their patient encounters to be judged as competent in order for them to maintain licensure.²⁰ The international push to assess a resident's competence in professionalism is also seen in Canada where some provinces mandate a practicing physician to show they are proficient in medical knowledge, communication and collegiality.²²

Discussion

Medical education should be reviewed both nationally and internationally with regards to its' core competency goals. This article mainly focused on graduate medical education within the United States, future research should take a critical look at the context of other osteopathic educational programs internationally. Care should be taken to make sure training on professionalism is assessed before residency graduation. A competency based medical education curriculum can be used to promote innovation as well as to provide the medical trainee an appropriate teaching environment that supports learning at all levels.

graduate medical education programs should insure that they are training their residents properly in professionalism as well as academic standards.²³ In order for GME to continue and progress in America, there must be an emphasis on competence as well as proficiency.²⁴ American graduate education can look to international competency based curriculums for guidance on restructuring the medical education curriculum. GME faculty must be trained in the art of adult learning and assessment. Overall, we need more

reliable and valid tools for assessing residents in all aspects of medical care. Taking a critical look at medical education both nationally and internationally can only help to improve future graduate medical education, and assure a future filled with competent, empathetic, globally engaged physicians.

Conflict of interest

None declared.

Ethical statement

Independent ethical review was not sought for this literature based commentary.

Funding

None declared.

References

1. Asch D, Weinstein DF. Innovation in medical education. *N Engl J Med* August 28, 2014;**371**:794–5.
2. Bristow S, Patrick S. An international study in competency education: postcards from abroad. *Competency Works Issue Brief* October 2014:1–35.
3. Nasca T, Weiss KB, Bagian JP. Improving clinical learning environments for tomorrow's physicians. *N Engl J Med* March 13, 2014;**370**:11.
4. Nasca T, Philibert I, Brigham T, Flynn TC. The next GME accreditation system – rationale and benefits. *N Engl J Med* March 15, 2012;**366**:11.
5. Buser B. The single graduate medical education accreditation system. *JAOA* April 2015;**115**:251–5.
6. Frank J, Snell LS, Ten Cate O. Competency-based medical education: theory to practice. *Med Teach* 2010;**32**:638–45.
7. Leung W. Competency based medical training: review. *BMJ* 28 September 2002;**325**:693–6.
8. Heffron M, Simpson D, Kochar MS. Competency-based physician education, recertification, and licensure. *Wis Med J* 2007;**106**:215–8.
9. Holmboe E. Faculty development in assessment: the missing link in competency-based medical education. *Acad Med* February 21, 2011;**86**:460–7.
10. Argyris Chris. Teaching smart people how to learn. *Reflections* 1991;**4**:4–15.
11. Caraccio C, Benson BJ, Nixon LJ, Derstine PL. From the educational bench to the clinical bedside: translating the Dreyfus developmental model to the learning of clinical skills. *Acad Med* August 2008;**83**.
12. Caraccio C, Wolfsthal SD, Englander R, Ferentz K, Martin C. Shifting paradigms: from flexner to competencies. *Acad Med* May 2002;**77**.
13. Brook R. Disruption and innovation in health care. *JAMA* October 7, 2009;**302**.
14. Davis D, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence. *JAMA* September 6, 2006;**296**.
15. Warltier D. Assessment of competency in anesthesiology. *Anesthesiology* April 2007;**106**.
16. Kirch D, Mitchell K, Ast C. The new MCAT 2015. *JAMA* December 4, 2013;**310**.
17. JAMA 100 years ago section. What is a "competent" physician? *JAMA* 1907;**49**:1287–907.
18. Chaudhry H, Gifford JD, Arthur S, Smith S, Thomas III R, Cruz M, et al. Ensuring competency and professionalism through state medical licensing. *JAMA* May 12, 2015;**313**.
19. Riley B. Need for standardized professionalism training in the osteopathic family practice residency training. *Osteopath Fam Physician* May/June 2014;**6** [Editorial].
20. Epstein R. Defining and assessing professional competence. *JAMA* January 9, 2002;**287**:226–35.
21. Leach D. Competence is habit. *JAMA* January 9, 2002;**287**:243–4.
22. Naylor C, Gerace R, Redelmeier DA. Maintaining physician competence and professionalism Canada's fine balance. *JAMA* May 12, 2015;**313**:1825–6.
23. Nasca T. Professionalism and its implications for governance and accountability of graduate medical education in the United States. *JAMA* May 12, 2015;**313**:1801–2.
24. Aggarwal R, Darzi A. Technical-skills training in the 21st century. *N Engl J Med* December 21, 2006;**355**:2695–6.