

# Getting Real: Embracing the Conditions of the Third-Year Clerkship and Reimagining the Curriculum to Enable Deliberate Practice

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## Abstract

There are many calls in the literature for changes in how medical students are educated. Although many curricular innovations have been attempted, a look at the theory behind how complex skills are learned provides useful information to guide new curriculum developments. The requirement of deliberate practice as the road map for success in the learning of clinical skills suggests that perhaps the current clinical milieu is not an optimal place for medical students to learn. The idiosyncrasy inherent in the dramatically

changed medical landscape of the last 20 years makes it difficult for such practice to occur; the apprentice model of legitimate peripheral participation in a community of practice as it used to exist does no longer. Indeed, current workplace environments are at odds with the needs of medical students. Overwhelming numbers of goals and objectives in existing third-year clerkships serve as wish lists of what students should learn. They should be replaced by a systematic, longitudinal curriculum in which all students can be

guaranteed to have encountered the core clinical competencies as defined. Moving the goals and objectives of the current clerkships to a longitudinal, spiral curricular format frees up clinical time in the third year to be used for students to find their future specialty and socialize into medicine. Doing so allows for an opportunity for students to spend extended time in areas of their interest. Moving to such a new curriculum format maximizes and optimizes learning while embracing the reality of current clinical workplace environments.

**T**he literature is crowded with calls for changes in how we educate medical students.<sup>1-5</sup> The frequency and similarity of reforms and recommendations for change suggest that the medical community has agreed that there are problems in the current system, but not as yet a satisfactory solution. Included in these calls for change is the need for a more competency-based education.<sup>1</sup> These calls have begun to be addressed by the Accreditation Council for Graduate Medical Education's Competencies and Milestones project in graduate education<sup>6</sup> and, more recently, by the Association of American Medical Colleges' core entrustable professional activities for entering residency.<sup>7</sup>

### The Theory Behind the Acquisition of Complex Skills

While lists of competencies, milestones, and core entrustable professional activities are rapidly being rolled out, it is unclear from

what basis they are generated. How exactly is competency in a complex set of skills achieved from a theory-based perspective? Anders Ericsson and colleagues<sup>8</sup> have described the characteristics of deliberate practice, which involves isolating component skills, practicing them under controlled conditions, and receiving immediate feedback from coaches who have observed the performances. The result is steady and consistent improvement until an expert level of performance is achieved. In work settings such as those found in the traditional medical training of 50 years ago, this practice was achieved through an apprentice model, one of legitimate peripheral participation,<sup>9</sup> a situated learning process by which newcomers become part of a community of practice by beginning with observation and then gradually moving into more intensive participation as they are deemed able. The apprenticeship model allowed for sustained interaction between a given student and faculty that led to a trusting relationship in which the faculty felt comfortable giving very specific feedback and the student felt comfortable admitting weaknesses, ultimately leading to an improvement in the student's performance.

Patients' lengths of stay are shorter, faculty rotate in and out of clinical assignments frequently, trainees' duty hours are restricted, and faculty must spend more time supervising residents. Billett<sup>10</sup> notes that "the key element of the workplace curriculum is the relationship between the goals and trajectory of the workplace and those of individuals who participate in and learn through their engagement in the workplace." However, the goals and trajectory of today's clinical settings now present a mismatch with those students trying to learn in it. Short relationships between attending and student, and resident and student, are the norm rather than the exception.<sup>11</sup> The system is criticized for the idiosyncrasy and opportunism (a student may see 10 cases of appendicitis during a clerkship, while another on the same clerkship will see none) which exists in the clerkships, causing faculty to "start over" with each new student on each new (extremely short-lived) rotation experience, assuming he or she knows nothing.<sup>2,12-14</sup> The inpatient setting, where much of clerkship education is conducted, also impedes the practice of diagnostic reasoning, because in the majority of those cases the diagnostic reasoning has already been completed by the admitting team. This current model is the antithesis of what is needed for legitimate peripheral participation, the substrate for necessary deliberate practice, to occur. Secondary to these brief

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*Acad Med.* 2015;90:1314-1317.  
First published online April 16, 2015  
doi: 10.1097/ACM.0000000000000733

### A Changing Clinical Practice Landscape

The clinical practice landscape has changed dramatically in the last 20 years.

contacts, it is not uncommon for faculty to need pictures of recently supervised students in order to remember them when it comes time to assign grades. Neither faculty nor students have confidence that the grades assigned (other than that from the United States Medical Licensing Examination shelf exam administered at clerkship end) are other than completely subjective. Petrusa<sup>15</sup> has demonstrated one outcome of such an educational model, determining that passing standards on standardized patient examinations must be lowered to the 60%–65% range lest whole cohorts of students fail—clearly a failure of curricula rather than the students themselves. He noted, “Near random clinical experiences of students do not provide consistent, repeated practice with important clinical cases to achieve minimally adequate performance on these objective performance examinations, leading to scoring ‘psychogymnastics’ to titrate fail rates.” Studies of the diagnostic reasoning abilities of senior medical students have shown wide variations in performance ability, as well as surprisingly low diagnostic abilities overall, pointing to a suboptimal educational system.<sup>16,17</sup> Longitudinal clinical reasoning studies have demonstrated that, perhaps somewhat surprisingly, growth in clinical reasoning in the third year is essentially flat.<sup>18,19</sup>

### Overwhelming Numbers of Goals and Objectives

To make matters worse, our current goals for students on third-year clerkships read more like wish lists than realistic goals and objectives which every student can be expected to achieve. The six “core” clerkships each have more than 100 goals and objectives recommended by their respective educational bodies.<sup>20–25</sup> How many of these goals and objectives can any school actually guarantee all of its students reach? How many can guarantee that even *one* student can reach them all during the course of a given clinical clerkship? Reality says otherwise. Students are learning on clerkships, but what they are learning is different from one student to the next, with no way to know which student got what.<sup>13</sup>

### Longitudinal Clerkships

In response to these calls for change, some schools have altered their third-year clerkship formats; longitudinal integrated clerkships are currently

being tried.<sup>26–28</sup> However, none of these new clerkship arrangements actually addresses the issue of idiosyncrasy and opportunism. Schools alter their clerkship structures while leaving lists of goals and objectives essentially unchanged. This is akin to rearranging deck chairs on the Titanic. That is, longitudinal rotations contain long lists of goals and objectives that students are expected to learn yet fail to recognize that none of the students can actually learn all of them as it is, especially in the current clinical environment in which they find themselves.

### A New Model for the Third Year

What if we have been looking at this problem backwards? We have been trying to keep our goals the same, while changing the clerkship structure (at least externally). Perhaps what we need to do is to look outside the box, jumping beyond our current context to an entirely new one, which takes the reality of current clinical settings into account from the beginning. What we need to do, if we can't really change the clinical milieu, is to change our goals for them to be realistic, no longer relying on students to have “equivalent” experiences when all data point to the fact that they do not. An envisioned third year must not rely on the clerkships themselves for the systematic instruction required to guarantee competency. Reducing the laundry list of goals and objectives and providing longitudinal opportunities for practice elsewhere that are parallel but separate allows students to get the deliberate practice they need. This model should address the problematic assessment outcomes described earlier.

As a result of a long, hard, data-driven look at the clinical clerkships, I suggest the following components of a new model of clinical education. As medical educators, we need to look at meeting the old goals (at least a realistic version of them which exposes students to the majority of common diagnoses they are likely to encounter) in a new way. An online Critical Clinical Competency curriculum (CCC) beginning in the first year of medical school and spiraling through years two and three will do just that, providing systematic deliberate practice. High-quality video instruction for clinical skills has previously proven successful.<sup>29</sup> Students would be required

to learn to critically reason through 12 CCCs (e.g., headache and abdominal pain are 2 CCCs) each year beginning in the first year, and ending at the end of the third year in a spiral manner. In the video, students will watch a physician and standardized patient during a history and physical examination sequence. The video will stop at intervals and ask the student his/her current differential diagnosis. After the student has entered these data, a video of three physicians (e.g., a family medicine, internal medicine, and emergency medicine panel) and a moderator would consider the same data as just seen by the student and generate their own list of differential diagnoses. The student would be asked to compare his/her differential with that of the panel before moving on to the next section of the history and/or physical examination.

Each year, students would have 4 diagnoses to learn within each CCC, for a total of 144 discrete diagnoses by the end of the third year, providing a longitudinal portfolio of clinical reasoning. For example, for the CCC of chest pain, students would learn to reason through cases on myocardial infarction, pulmonary embolus, GERD, and costochondritis in the first year; pneumothorax, pneumonia, aortic aneurysm, and sickle cell crisis in the second year; and anxiety, myocarditis, cocaine intoxication, and pericarditis in the third year. Cases would be matched to topics taught in the curriculum in the first and second years so that the learning is integrated with both the basic science and clinical activities that are occurring. For example, in a predominately problem-based learning curriculum, cases would be introduced in the unit that most closely represents the CCC in question (e.g., the headache CCC might best fit in a unit addressing neurology, musculoskeletal issues, and behavior). Students would be encouraged to review their portfolios of cases completed and yet to be done (Level 1 CCCs must be completed in the first year and Level 2 CCCs must be completed in the second year) as they enter their clinical years, and review cases or engage in Level 3 cases (which must be completed in the third year) as their clinical work suggests. Again, for example, students in the neurology clerkship might be expected to review the CCCs of headache learned in the first and second years, and engage in the headache CCC for the third year.

No other instructional changes would be made in the first two preclerkship years; a redesigned third year is described below.

Given that the CCC curriculum would expose all students to the *same* initially undifferentiated diagnoses, and make sure they can reason their way through each one before progressing, idiosyncrasy and opportunism would be removed; all students could be guaranteed to handle all cases. Although there are virtual patient case programs which have already been developed and are currently in use at some medical schools,<sup>30</sup> they tend to be used more sporadically (i.e., not all clerkships use them) and are predominantly used in the third year. The CCC curriculum would begin in the first year and spiral through the third year, creating longitudinal portfolios of a student's progress, forcing deliberate practice, and giving students routine and specific feedback for each case. Uncued comprehensive standardized patient examinations at the end of each of the three years would assess students' performance and acquisition of these competencies; students unable to perform would not graduate. This competency-based curriculum matches the call made by Irby and colleagues.<sup>1</sup> It is my hypothesis that with this model students would perform on uncued comprehensive standardized patient examinations at a much higher level than the current 60%–65%. Scores of 85% and up would become the norm for passing standards. Improvements of this magnitude have been seen at the Southern Illinois University School of Medicine when similar methodology was used to standardize the 140+ item screening physical examination that students must master in their preclerkship years.<sup>31</sup>

There are two major categories of learning that all students do encounter in their clinical rotations. The first is that they figure out what they want to do after they graduate from medical school, or confirm ideas about this that existed prior to the third year. That is, they “find their people.”<sup>32,33</sup> The second is that they begin to socialize into medicine, becoming familiar with what a medical setting is actually like, although there are data to suggest that currently this socialization is impeded by the needs of the students to manage impressions of their faculty to get good clinical grades, and to slip

away to study for their shelf-exams.<sup>11,32,33</sup> (It is difficult to fulfill the tenets of Lave and Wenger's<sup>9</sup> principles of legitimate peripheral participation in a community of practice if one is not present to do so, and when present, the students are focused on managing impressions of themselves during very short-term relationships with supervisors rather than deliberately exposing weaknesses to be addressed by feedback!) Neither one of these important goals is mentioned in the above six core clerkship lists; rather, they are relegated to the hidden curriculum.

If we are not meeting the laundry lists of old goals, nor including as explicit goals important learning experiences, perhaps it is time to set new (and more realistic) goals for the clerkships. With a realistic list of goals and objectives handled in the CCC curriculum as described above, perhaps the *only* new goals and objectives for clerkships should be to socialize medical students into medicine and help them find their people. This can be accomplished by much shorter clinical rotations. If the plethora of other activities that get put into clerkship calendars (lectures, shelf exams, other required activities) are removed, socialization may be improved by a more immersive, clinically intensive experience. Four-week-long rotations (for a total of eight months) in internal medicine, pediatrics, surgery, psychiatry, neurology, family medicine, emergency medicine, and obstetrics–gynecology can provide enough exposure to the field for a student to decide that a given specialty is not a good match, a perfect match, or on the “maybe” list. With no live lectures, only short “Khan-like” need-to-know videos,<sup>34</sup> and no end-of-clerkship shelf exams, students could expect to spend 6 to 8 hours of time per day in purely clinical experiences, much more than they do now.<sup>32</sup> (For example, in a current 6-week clerkship, one could expect to spend  $5 \text{ days} \times 3 \text{ hours/day} \times 6 \text{ weeks} = 90$  hours of clinical time, while in the CCC third-year students would spend  $5 \text{ days} \times 7 \text{ hours/day} \times 4 \text{ weeks} = 140$  hours of clinical time.) This would allow a much greater opportunity to actually have legitimate peripheral participation<sup>9</sup> on a team with expectations for more intensive participation, because students would become known to their faculty and residents over 4 weeks, much more so than the 1 to 2 days to a week per attending that many spend now.

The removal of the shelf exam would also allow for better alignment with assessment. Assessment would be based on the intensive observation afforded to each student by the greatly lengthened amount of time a lower number of faculty would have spent with the student, as well as standardized clinical interactions at the end of the curriculum. Rather than removing themselves to study for the shelf test, students could seek out clinical experiences in the new model. The fact that assessment drives learning, as well as the priority of learning, has been previously addressed.<sup>35–37</sup> Embracing the idiosyncrasy and opportunism in the third-year clerkships, instead of fighting it, allows students more longitudinal contact with one or a few faculty for 4 weeks, instead of a smorgasbord of daily shifting supervisors as the student is shuttled around in a misguided attempt to see everything. This kind of rotation allows for more opportunities for real and meaningful coaching experiences, necessary for deliberate practice.<sup>8,9</sup> With a more longitudinal (4-week), long period for a faculty member and student to interact, the components of deliberate practice (building a relationship, expectation setting, observation of learner, practice by learner, and immediate feedback) could be realized. Students coming from the first and second years with rudimentary skills and experience in communication and physical examination, interprofessional teamwork, and other relevant competencies (as is taught in many preclerkship courses titled “Doctoring” or “Essentials in Clinical Medicine”) would continue to improve and be assessed in these areas by faculty trained to deliver such feedback and around long enough to really know their learners.

National calls for individualized flexibility in the curriculum have also been made.<sup>1,38</sup> These could be realized in the CCC curriculum I propose as well. Because four months of the year remain after the eight-rotation immersion experiences, students could create new opportunities for themselves, based on their needs and interests. Perhaps a student who has decided to go into surgery will take a four-month intensive surgical experience, rotating through surgical subspecialties of potential interest. Students interested in family medicine would be able to rotate on a four-month outpatient ambulatory care experience essentially full-time, something

not available currently. The extended time period (four months) would allow for greater preparation for the residency of the student's choice as well. Students unsure of their career choices would have a mixture of clinical experiences planned, based on their interests. Struggling students would have an extended period of time for evaluation and remediation during all or part of this four-month period. For highly performing students, graduation at the end of the third year becomes a possibility.

### Concluding Remarks

The results of embracing the realities of our current clinical settings, providing reachable goals and objectives that *all* students must achieve, and rethinking our current clerkships in a brand new way can only be advantageous for medical students. Not only will we “answer the call” of those requesting medical education changes, we will have embraced our new reality and reworked curricula to maximize and optimize the learning within it. We will not revise a curriculum simply for the sake of change, or change with no clear direction of the journey. Rather, we will bring ourselves into alignment with what we are already saying we are doing, rather than pretending that “all is well” with the system in which we find ourselves currently. We will, in effect, have “gotten real.”

*Acknowledgments:* The author would like to thank Drs. Reed Williams, Anna Cianciolo, Nicole Roberts, Heeyoung Han, and Kevin Dorsey for their tireless help in refining this perspective and manuscript. Faculty and staff at Southern Illinois University School of Medicine have put in innumerable hours in the pursuit of educational innovation, and the author wishes to thank them for it as well.

*Funding/Support:* None reported.

*Other disclosures:* None reported.

*Ethical approval:* Reported as not applicable.

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