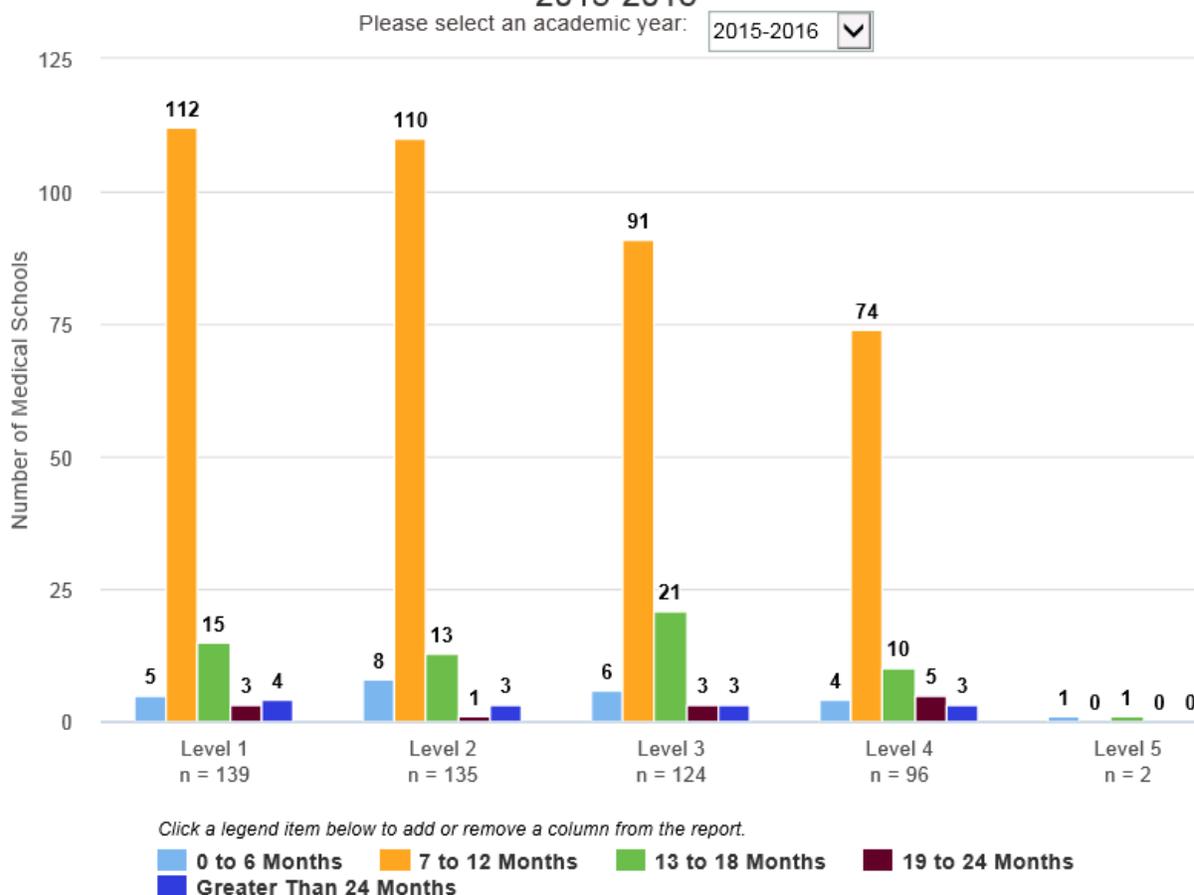


# Curriculum Inventory in Context

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Length of Academic Levels Distribution in US and Canadian Medical Schools:  
2015-2016



## Compression of Basic Sciences in Medical Education

As curricular evolution unfolds in medical education across North America, there is an increased emphasis on integration of basic and clinical sciences, as well as an increased importance of early clinical experiences in the first two years. The incorporation of more clinical experiences and content can result in a decrease in the relative amount of time devoted to core basic science concepts. Layered on this shift in emphasis from acquisition of knowledge to application of knowledge is the fact that often schools are looking to compress the total amount of time spent in the “preclinical years” with a concomitant increase in the time devoted to patient care experiences and advanced clinical topics in the third and fourth years of medical school as illustrated in the above Curriculum Inventory chart. Finally, fueling these changes is the shift in

emphasis of the Step 1 exam away from factual recall towards clinical vignettes that assess concept integration and clinical reasoning.

Several excellent articles have addressed the changing role of the basic sciences in medical education (1-5). A common theme among these reviews is the perception that there is a reduction in time and emphasis on the foundational sciences in the preclinical years. Indeed, the original 2+2 model proposed by Flexner (6) often no longer seems relevant now that students are routinely in clinical practices within the first year. As such, the terms “preclinical” and “clinical” are becoming increasingly outdated.

Similar to several other medical schools (7) we at The Ohio State University College of Medicine have decreased the number of months students spend in the curriculum prior to entering the third year clerkships. When the curriculum was revised in 2012 the amount of time spent in the first and second years was reduced from approximately 20 months to 17 months while simultaneously increasing the number of hours spent in clinical experiences during this time. Our students begin the third year on approximately May 1. Other schools begin their required clerkships even earlier (7).

A variety of considerations arise when attempting to determine appropriate amount of time devoted to foundational vs clinical sciences, not the least of which is the identification of the essential elements of each experience. It is not uncommon for curricula over time to become increasingly packed with educational opportunities, as core concepts initially identified continue to gradually expand via curriculum creep. Perhaps this evolution is accelerated in medical school curricula in which a large number of different educators each have a relatively brief amount of time to cover the essential (to them) aspects of their respective topics. As such, over time topics may be neglected or overemphasized depending on the balance of basic science and clinician educators involved in the curriculum.

Simultaneous with the “rebalancing” of foundational and clinical sciences was the recognition that traditional models of lecture based medical education were becoming increasingly irrelevant. Active learning using flipped classroom concepts incorporating in class case-based presentations or Team Based Learning activities provide outstanding opportunities to turn the memorization of foundational science concepts into clinical understanding. Flipping the classroom however, can result in new considerations that may exacerbate the challenges of teaching the basic science content in the early years. Basic science faculty are often not trained or comfortable teaching the clinical application of foundational science concepts. Similarly, academic clinicians are increasingly challenged to balance the expectations of patient revenue generation with educating the next generation of physicians, and are also often uncomfortable teaching core foundational science content. Opportunities for increased collaboration exist (co-teaching TBLs for example) but in practice these are often difficult to realize in a busy curriculum. Shifting emphasis away from passive lectures to eLearning approaches also often

moves educators out of their comfort zones into areas for which they may have little training or experience, with inadequate time to become skilled with new educational paradigms.

With regards to the latter, interprofessional groups of learners participate in inpatient and ambulatory standardized patient interactions across a range of OUD risks and patient demographics, receive hands-on didactics in co-prescribing and administering naloxone and learn from panels of patients in recovery and family members of people suffering from OUD. The faculty are drawn from multiple professions and disciplines including the diverse divisions of medicine (procedural and non-procedural), nursing, pharmacy, dentistry and behavioral health, emphasizing the necessity for all providers to attain core knowledge, and the interprofessional approach to countering this disease. Community partnerships supported recruitment of panel members and standardized patients from diverse backgrounds to meet our goals of emotional authenticity and medical accuracy throughout the curriculum.

Compression of basic science content or shortening of the time prior to entering the clerkship years can be partially addressed by returning to important basic concepts in the third and fourth years. Re-emphasizing key basic science concepts in later years is sound pedagogy, but in practice is often difficult to achieve. Med 3 is often the busiest year of the curriculum so finding time to revisit foundational science content is challenging. In addition, finding basic science faculty who are skilled teaching applied concepts or comfortable in clinical settings may prove difficult. The fourth year may have more flexibility with respect to time, but is even further removed from when the content was initially taught making relevance (especially as viewed by the students) challenging.

Ultimately, any change in curricular emphasis will be measured by the success of the students in their ability to take care of patients, as well as their performance on their licensing exams. As mentioned in the beginning of this commentary, Step 1 is increasingly emphasizing the application of foundational science concepts in clinical contexts. Finding the right balance and sequence of foundational and clinical science education should help meet the goals of enabling students to excel enough to enter their chosen specialty, and ultimately become skilled practitioners in the art of patient care.

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## References

1. Fincher, R. M., Wallach, P. M., & Richardson, W. S. (2009). Basic science right, not basic science lite: medical education at a crossroad. *Journal of General Internal Medicine*, 24(11), 1255-1258.
2. Finnerty, E. P., Chauvin, S., Bonaminio, G., Andrews, M., Carroll, R. G., & Pangaro, L. N. (2010). Flexner revisited: the role and value of the basic sciences in medical education. *Academic Medicine*, 85(2), 349-355.
3. Grande, J. P. (2009). Training of physicians for the twenty-first century: role of the basic sciences. *Medical Teacher*, 31(9), 802-806.
4. Hopkins, R., Pratt, D., Bowen, J. L., & Regehr, G. (2015). Integrating basic science without integrating basic scientists: reconsidering the place of individual teachers in curriculum reform. *Academic Medicine*, 90(2), 149-153.
5. Kulasegaram, K. M., Martimianakis, M. A., Mylopoulos, M., Whitehead, C. R., & Woods, N. N. (2013). Cognition before curriculum: rethinking the integration of basic science and clinical learning. *Academic Medicine*, 88(10), 1578-1585.
6. Flexner A. Medical Education in the United States and Canada. A Report to the Carnegie Foundation for the Advancement of Teaching, Bulletin No. 4. Boston, Mass: Updyke; 1910.
7. Krane, N.K. Length of Academic Levels Distribution in U.S. and Canadian Medical Schools. Commentary on the Curriculum Inventory Reports graph, Length of Academic Levels Distribution in U.S. and Canadian Medical Schools. *Curriculum Inventory in Context*, Jan 2016 (Vol. 3, No. 1)