

The 10 000-hour rule and residency training

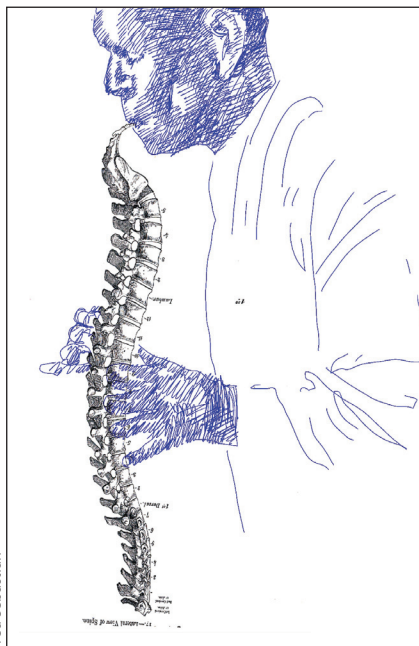
With new rules limiting the number of hours residents can work in some jurisdictions, should medical educators be rethinking existing training strategies? Is it time for medical education itself to become more evidence-based?

There are 2 ways to deal with reduced working hours: improve the *quality* of the educational experience or increase the length of training. Studies of human performance in fields as disparate as chess, music, sports, surgery and mathematics have shown that attainment of an expert level of performance requires about 10 000 hours of focused practice.¹

How long does it take to accrue 10 000 hours of practice? Working 80 hours a week for 48 weeks a year, the 10 000-hour mark is reached in a mere 2.6 years. So what's all the fuss about then? There's a catch in the 10000-hour rule: practice time must be deliberately focused on learning a particular skill.² Ericsson and colleagues define deliberate practice as "highly structured activity, the explicit goal of which is to improve performance."³ Is learning the main goal of most of a resident's daily activities or is learning merely a byproduct of service-related tasks?

Another number appears in studies across disciplines: 5 hours.¹ From virtuoso musicians to elite athletes, top performers spend 4 to 6 hours daily in intensely focused, deliberate practice.³ Above this level, concentration and performance levels drop off and diminishing returns are received from time invested, a phenomenon known as "effort constraint."²

In real life, residency training involves a mixture of education and service. Many learning activities, such as reading, are done outside of working hours. Suppose a resident is fully engaged in learning relevant skills 5 hours a day, 6 days a week: how long until the magic 10 000 hour mark is attained? Allowing for 4 weeks of holidays annually, the answer is about 6.9 years. The neurosurgery residency I graduated from was 6



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years in length, with most residents electing to take at least 1 extra year of fellowship training. Coincidence?

It is clear that as the number of hours of training decreases, a greater emphasis must be placed on the quality of training. Not only must adequate time and exposure to clinical problems be provided, the learner must also be able to maintain focus on the learning task.⁴ The time spent by a resident watching an operation from the sidelines, or admitting the fifth "weak and dizzy" patient at 4 am probably doesn't fall into the category of deliberate practice!

Faced with a 4-hour block of time, the exhausted resident may be better off taking a 3-hour nap than studying assiduously for 1 hour, than to grind through 4 hours of relatively unproductive reading. A study of high-level violinists revealed that top performers practised more, were more likely to take naps during the day and got a statistically significant greater amount of sleep.² Ensuring adequate rest and recovery time is part of the logic of reduced resident working hours.

Few medical educators receive more than rudimentary instruction on how to teach something as complex as modern

medicine. Do we do our profession a disservice? What can busy clinicians do to improve the quality of their teaching? There is a wealth of information to be mined from fields such as human performance, adult education, psychology, learning theory and the study of expertise. How would a coach, trainer or educator from a field unrelated to medicine appraise and improve on our current training programs and methods?

One key is to ensure the learners are actively engaged in the learning process by, for example, placing information in a clinically meaningful context, creating situations that facilitate deliberate practice, asking pupils questions and providing immediate valid feedback.⁴ The idea is to make learning an active process rather than a passive one.

There is an art to effective teaching. I remember professors from my medical school days who kept me spellbound during teaching sessions. I would leave their lectures fired up to learn more. I can still recall the lessons they taught. Did they possess a natural gift for engaging students in the learning process? Or did they just hone their skills with 10 000 hours of practice?

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