Expertise is a result of deliberative practice, Not genetics or Length of training

Multiple studies disputed a genetic component to expertise. For example, studies in master chess players do not show any major genetic benefit but do show that Master chess players have more than 50000 chunks or patterns (like learning a new language) (Ericsson 2008). Furthermore, length of training, professional experience, and even reputation as shown by being nominated by peers have not been shown to effect expertise in OBJECTIVE measures of their domain. What has been shown to be effective with over 40 years of studies to support it is a method of reflection and training called deliberative practice.

“Chance favors only the prepared mind”- Louis Pasteur

Definition of Deliberative Practice

Deliberate practice has 4 basic concepts

Motivated learner and Mentor: The learner should be motivated and buy into the process. The deliberate practice method offers little immediate gratification since as soon as you master a skill you move on to another that pushes you outside your comfort zone. It is tiring and hard work with little reward. For pianists it is shown that they require one hour of coaching a day. And at least 4-5 hours of practice on a defined goal a day for 10 years

Suggestions to keep the learner motivated: Create exercises that will prevent arrested development. Arrested development appears after 50 hours for most recreational activities (Driving, Skiing, Tennis). Seek out training situations that push you outside your comfort zone
1. Give the learner a task with a well defined goal
2. Provide real time feedback
3. Provide opportunity for repetition and refinements

**How can you initiate a Deliberate Practice Model in a Busy Emergency Department?**

Steps develop a deliberate practice based model of emergency medicine education.

First, assess buy in and readiness to learn. Demonstrate importance in becoming an expert clinician. Define expertise for the learner. This is not national recognition or peer nomination. This is making yourself a better doctor so that you can save more lives.

Second, assess readiness to learn. Ensure your learner is not sleep deprived. That person should not be focused on other tasks. Start your discussion by saying, “do you have a minute for a deliberative practice case “.

Lastly, recognize that just because a resident is excellent at one skill it does not translate into excellence in another. (Ericsson 2008)

> “Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.” Albert Einstein

**The Academic attending is the learners’ coach.**

Create training situations with goals that exceed the learner's current level of knowledge. Assess their knowledge base by getting to know them. Create a central repository for resident experience and knowledge on different things that the resident has with them. Determine which phase of knowledge acquisition they are for a particular task (Ericsson 2008).
Phases of Knowledge

Causal Knowledge is the most basic type. We suggest using Paucis Verbis Cards, create a playbook for teaching pearls, or lastly a collection of radiographs or ekgs with outcomes of patients.

Analytical Knowledge is the next phase of knowledge acquisition. Learners with more concise presentations have better analytical knowledge. We suggest using a case repository of rare or interesting disease. Keep the information just above the learner’s ability. That case should have a correct action. Give the resident the opportunity for feedback, reflection, correction. Follow this by another similar brief task with feedback until completed with consistent success. Then, differ the cases slightly.

Resources include: Case files in Emergency Medicine, NEJM Case reports sub-categorized for emergency medicine, Practical teaching in Emergency Medicine, Have a series of different ekgs with subtle differences to show your residents or the Milestone Workbook being created for CORD.

The highest form of knowledge is experiential. This can be achieved with simulation, video recordings of interesting cases and solitary study and case review/follow up. Ask them to go look up a similar case and walk through the steps of what you would do and why. Then talk about it the next shift or in small group lecture.

In order for deliberate practice to work the learner must get feedback. This may be in the form of real time from an attending or follow up with phone calls or chart reviews. It is NECESSARY to know outcomes to prevent arrested development. This has been shown in radiology where superior reading accuracy for mammograms by radiologists is related directly to the quality of feedback on diagnoses provided (similar to calling patients back)

Lastly, don’t teach what you don’t know. Become an expert yourself on a subject before teaching it.

How can you maintain expertise after it is achieved?

How to improve yourself in an unchallenging environment? Chess players look at published games and match their moves to other master chess player’s moves. We could do the same using journals like NEJM cases reports or morbidity and mortality conferences. Avoid the cognitive pitfall of early closure that frequently occurs with experience. Teach critical listening: Critical listening remains equally important at advanced levels... “In his practicing, the real art is for the pupil to acquire the uncanny ability to listen to his own work to discover his own minute failing” so listen to your patients and to you own work (metacognition)
References


Resources for your playbook:

http://academiclifeinem.com

http://www.mededmasters.com/index.html

https://www.umem.org/res_pearls_browse_cat.php

http://www.bestbets.org/

http://www.thennt.com/

http://emcrit.org/

http://www.ahcmedia.com/emreports/pearls.htm

Case Files in emergency medicine

Evidence based emergency medicine textbook

JAMA Rational Clinical Examination Series


Journal of Emergency Medicine: Visual Diagnosis in Emergency Medicine

Atlas of Emergency Medicine