



## Handout for *Master Your Ophthalmic Knowledge with Self-Assessment Tools* June 23, 2021 Webinar

### Links

[5 Principles and Tips for Effective Self-Education](#) by Kevin E. Lai, MD

The Residents section of the Academy website contains many useful resources for residents:

<https://www.aao.org/residents>

[Make It Stick: The Science of Successful Learning](#) by Peter C. Brown, et al

[Resources for PGY-1 and PGY-2 residents](#)

[BCSC Self-Assessment Program](#)

[Resident Knowledge Exchange](#)

Other Academy resources for self-assessment:

- [Diagnose This](#)
- [ONE Network Self-Assessments](#)

### Terms

**Spacing:** This is the principle of splitting up study times to allow for some space between learning and retrieval. Retention is increased because the knowledge is not crammed into a single prolonged session, where fatigue can impair long-term memory formation. Different lengths of spacing are necessary depending on how new the material is that is being learned, and how readily the information is retrieved - the newer the information or the more difficult it is to retrieve, the shorter the spacing may need to be initially to help solidify the concept. Sleeping and rest may be helpful methods of spacing. Other ways of spacing include taking frequent breaks or switching activities.

**Interleaving:** Contrary to the popular belief that we should attempt to master one skill or concept before moving on to the next subject, cognitive research suggests that a varied, more random approach to learning similar topics helps solidify knowledge better. This can be accomplished by studying multiple similar subjects and moving on to other topics before being comfortable with each topic. It is thought that this strategy forces the brain to distinguish differences and identify similarities between topics for a more integrated understanding of the material. For example, it may be helpful to learn a little bit about all of the phakomatoses in one study session and work practice problems about all of the phakomatoses instead of trying to master each individual phakomatosis first.

**Reflection:** Active learning often requires time to intentionally process experiences and new knowledge as part of the effort to integrate that knowledge into our existing mental frameworks. Reflection asks questions such as, "What did I do well?" "What did I not do well?" "How can I improve for next time?" and "What knowledge gaps do I have?" This activity fuses the experiences we encounter in clinic and surgery with the information we are studying.

**Retrieval practice:** This study strategy is based on the cognitive research that suggests that active forms of learning (such as quizzing and flashcards) are more effective than passive methods of learning (such as reading textbooks or taking multiple choice quizzes). The principle is to prompt the brain to actively generate the answer from memory, rather than passively recognize a pattern or "buzzword." Free-answer quizzing, flashcards, and other low-stakes methods of effortful retrieval are often difficult and uncomfortable, but have the effect of making that information more readily available for retrieval in the future. An analogy of how our memory selectively prefers more frequently-used information can be found in the kitchen: dishes we use daily are stored within easy reach, but infrequently-used dishes are

stored on shelves that are more difficult to reach. If there is a dish that previously was not used very frequently but is used frequently now, we move that dish within easy reach. False fluency can occur when we resort to passive methods, in which we can delude ourselves into believing that we have mastered a topic but cannot actively recall any information about the topic when prompted. The goal of retrieval practice is not to achieve a certain score, but to actively recall information so that it becomes instinctive.

**Feedback:** To prevent errors from accumulating in our knowledge, we need to have timely feedback about our performance to correct mistakes and gaps in knowledge. There has to be a short barrier between the act of retrieval and the feedback; otherwise the brain resorts to more passive methods of learning. For example, a practice question should be answered/selected before the correct answer and discussion is displayed.

### Sample Study Schedule for Residents

	Minutes	Content
Before clinic	10	<ul style="list-style-type: none"> <li>• 2 random practice questions</li> </ul>
Lunch	15	<ul style="list-style-type: none"> <li>• Read about practice questions</li> </ul>
After clinic	15	<ul style="list-style-type: none"> <li>• Reflect on cases from the day</li> <li>• Identify cases to add to outline</li> </ul>
Evening	30	<ul style="list-style-type: none"> <li>• Review practice questions from AM (free-answer)</li> <li>• Learn 2 topics from outline</li> </ul>
Weekend	Four 15-min sessions	<ul style="list-style-type: none"> <li>• 10 random practice questions</li> <li>• Review topics covered from the previous week</li> <li>• Learn 2 topics from outline</li> </ul>