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Featured Article

Deliberate Practice for Mastery Learning in Nursing

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Abstract: The teaching of psychomotor skills in schools of nursing and medicine has remained basically unchanged for the past 50 years despite known problems with inconsistent teaching, testing, and retention of critical foundational skills. Add to this, prolonged periods of non-use of certain skills known as retention intervals, and there is bound to be loss of skill mastery and decay. It is imperative that nursing faculty identify what skills are critically important and require concerted attention to ensure competency and retention. This manuscript provides evidence to consider deliberate practice with mastery learning as a viable alternative to skill acquisition.

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The teaching of psychomotor skills in schools of nursing and medicine has remained basically unchanged for the past 50 years despite known problems with inconsistent teaching, testing, and retention of critical foundational skills (Bjørk & Kirkevold, 2000; DeBourgh, 2011; Gonzalez & Sole, 2014). The assumption has been that as learners enter the workplace, frequently used skills would be mastered on the job. However, research demonstrates that stagnation and skill drift from baseline skill checks occur over time for all providers without repeated refreshing and practice (Barsuk, Cohen, McGaghie, & Wayne, 2010; Barsuk et al., 2015; Barsuk, McGaghie, Cohen, Balachandran, & Wayne, 2009; Bjørk & Kirkevold, 2000). Add to this, prolonged

periods of nonuse of certain skills known as retention intervals, there is undoubtedly a loss of skill mastery and decay.

As a general rule, the longer the retention interval, the greater degree of skill decay (Arthur, Bennett, Stanush, & McNelly, 1998). Gonzalez and Sole (2014) found that in as little as four to six weeks, many undergraduate nursing students forgot the steps for a particular skill. Kardong-Edgren and Mulcock (2016) found that 12 of 13 students who had been checked off on urinary catheterization skills by their clinical faculty in each of three previous clinical rotations failed to maintain procedural sterility when placed in a simulation room alone, without faculty coaching during the procedure. Medical educators report similar findings. Wayne et al. (2005) found that internal medicine residents who were certified as advanced cardiac life support (ACLS) providers using traditional practice and actual

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clinical experiences struggled with ACLS protocols compared with internal medicine residents who were trained in ACLS with deliberate practice (DP) protocols. Similarly, Friedman, Siddiqui, Katznelson, Devito, and Davies (2008) found that among anesthesiology students,

mastery of manual skills improved over a six-month training period, with the exception of aseptic technique. Spanos and Patterson (2010) had to discontinue an ACSL code drill study because new residents who had been recently “certified” in ACLS could not identify arrhythmias.

During any given semester, student nurses are expected to learn multiple psychomotor skills. For example, in one of the

authors’ previous nursing programs, 27 skills were front loaded in the foundation course. Front loading was defined as psychomotor skill demonstration and practice early on in the semester before entering the clinical setting. The intent was to make students more comfortable before actual patient care. The following semester, there were an additional 21 skills *front loaded* in a medical-surgical course. Some of these skills had a higher impact value, such as the urinary catheter insertion and sterile dressing changes; yet, they were all often presented with a respective checklist and the same level of importance. There is not enough time in most curricula to ensure students master all these skills. Students are typically checked off once and may never have an opportunity to revisit the skill again until after graduation (Gonzalez & Sole, 2014). To further emphasize this point, with the increased incidence of catheter-acquired urinary tract infections in hospitals, nursing students in the state Florida are not allowed to place urinary catheters, out of concern for patient safety (Saint, Gaies, Fowler, Harrod, & Krein, 2014).

The additive curriculum in both nursing and medicine results in a myriad of skills being “taught but forgotten” very quickly. The “shotgun” approach with emphasis on basic skill attainment and little attention to retention continues unabated (Oermann et al., 2011). It is imperative that nursing faculty identify what skills are critically important and require concerted attention to ensure competency and retention. Which skills carry greater weight, and if performed incorrectly, can result in poor patient outcomes? What could be omitted and still ensure learners are equipped for professional practice? DP provides an evidence-based and successful alternative to traditional methods of skills education.

Key Points

- Current practices for psychomotor skill retention are obsolete.
- Deliberate practice with mastery learning is a viable concept for skill attainment.
- Reduction in cognitive load results in a more effective learning experience.

What is Deliberate Practice?

The term DP remains relatively nascent in the nursing literature and is rarely coupled with the accompanying term mastery learning. DP is defined as “effortful activities designed to optimize improvement” (Ericsson, Krampe, & Tesch-Romer, 1993, p. 363). A large body of research suggests that DP in a controlled setting can help identify mediating mechanisms that may produce superior skill performance and retention, such as “think aloud,” motivation, and performance monitoring, and that accumulated amounts of DP are related to attained levels of performance. In other words, the more you engage in optimal practice, the better you will become (Ericsson, Charness, Feltovich, & Hoffman, 2006).

McGaghie, Barsuk, Cohen, Kristopaitis, and Wayne (2015) explain that DP to a mastery level involves (a) a baseline diagnostic examination of knowledge and/or psychomotor skills; (b) objectives and practice ordered by degree of difficulty from simple to more complex, each iteration providing increasing real-world contextualization, a set passing standard for each skill; (c) formative, consistent, and immediate feedback provided during skill learning by coaches to gain mastery; and (d) test out with mastery achieved or return to the educational intervention for more practice, as required, until the mastery standard is achieved.

The word remediation is avoided in the DP approach. It is acknowledged that some learners will take longer than others to achieve mastery but that *mastery by all is expected* before moving on to another skill. Barsuk, Cohen, Wayne, Siddall and McGaghie (2016) found that about 20% of all their students required extra time to reach mastery but that most students do this within 15 minutes to an hour of additional practice. In certain instances, overlearning is required and recommended. Overlearning is defined as the additional training beyond what is required for minimal proficiency (Arthur et al., 1998). Overlearning has been linked to increased automaticity, which in turn decreases cognitive load and leads to better retention.

Deliberate Practice and Cognitive Load

Cognitive load theory suggests that the human brain can only process about 20 seconds of information and approximately seven elements (steps) when engaging the working memory (WM) (Reedy, 2015). Additionally, presenting abstract material without context burdens the WM, limiting the elements the brain is able to process, from seven steps down to three to four steps (Josephsen, 2015). The WM processes new information and organizes prior knowledge. However, it is limited and relies in part on long-term memory. Long-term memory allows for problem resolution and storage of concepts. Information is chunked together to

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