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Point-of-Care Learning for Allied Health Skill Retention

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Abstract

Allied health practice requires clinicians to retain a broad range of assessment, procedural, communication, clinical-reasoning, and equipment-related skills that may not be used with equal frequency in everyday practice. Competence demonstrated during formal education or a scheduled workshop can subsequently decline when a skill is performed infrequently or when opportunities for corrective feedback disappear. Physiotherapy evidence has demonstrated this retention problem directly: Snodgrass and Odelli reported improvement in lumbar-mobilization performance following objective feedback but also observed rapid deterioration in skill retention. Point-of-care learning offers a potentially useful response because short, highly relevant educational resources can be accessed near the time a clinician needs to perform or reconsider a clinical task. Point-of-care learning is conceptualized as brief, task-specific education positioned sufficiently close to clinical performance to reactivate relevant knowledge, procedural sequences, safety checks, and clinical reasoning. It is distinguished from unrestricted searching for information during care. Effective point-of-care resources should be trustworthy, quickly searchable, concise, clinically relevant, and capable of supporting the immediate question without producing avoidable cognitive burden. Cook and colleagues' study of point-of-care knowledge resources similarly emphasized accessibility, efficient navigation, credibility, and relevance as important characteristics of effective clinical learning resources.

Because no original allied health practitioner dataset was supplied, 600 synthetic professional profiles were modeled across three educational pathways: a one-time competency workshop, a point-of-care refresher pathway, and point-of-care refreshers combined with spaced retrieval and deliberate practice. All pathways began with an equivalent simulated performance score of 86. At week 12, retained performance declined to 48 after the one-time workshop, remained at 70 with point-of-care refreshers, and remained at 81 when point-of-care learning was combined with spaced retrieval. These values are methodological illustrations and do not represent real intervention effect sizes.The theoretical model is consistent with broader health-professions education evidence. The paper concludes that point-of-care learning should not replace foundational education or supervised competency assessment. Its strongest role is likely to be as a skill-reactivation layer embedded within a broader retention system incorporating retrieval, repeated practice, feedback, competency reassessment, and escalation when a clinician cannot safely regain proficiency through a brief refresher.

Keywords: point-of-care learning; allied health; skill retention; microlearning; spaced learning; deliberate practice; clinical education; continuing professional development

1. Introduction

Allied health professionals work in clinical environments in which competence depends on the continued availability of both declarative knowledge and applied clinical skills. Physiotherapists, occupational therapists, speech and language professionals, respiratory therapists, radiographers, rehabilitation professionals, and other allied health practitioners may need to conduct assessments, operate specialized equipment, interpret clinical findings, perform manual or procedural techniques, communicate with patients, and make time-sensitive decisions. Yet not every skill is practiced with equal frequency. A procedure learned successfully during formal training may be performed only occasionally once a practitioner enters a specialized clinical role. The resulting interval between formal education and subsequent performance creates a plausible risk of skill decay. Physiotherapy research offers a particularly relevant example: objective feedback improved students' lumbar-mobilization performance, but retention subsequently declined rapidly.

Traditional continuing professional development partly addresses this challenge through workshops, courses, simulation sessions, seminars, and competency updates. Such activities remain valuable because they provide structured opportunities for education and supervision. Their timing, however, may not correspond closely with the moment at which a clinician actually encounters an infrequent task. A professional may attend a workshop months before a particular skill becomes clinically relevant, creating a temporal separation between training and application. Point-of-care learning addresses a different educational problem: it provides focused information near the clinical moment in which a knowledge or performance need emerges. Cook and colleagues found that clinicians value point-of-care knowledge resources that are rapidly accessible, credible, searchable, and directly relevant to clinical questions.

Short-form education alone does not solve the retention problem. De Gagne and colleagues' scoping review characterized microlearning as learning delivered through small, focused units and found generally favorable effects on knowledge and confidence across health-professions education, while also identifying substantial heterogeneity in design and evaluation. A brief clinical refresher may therefore help reactivate forgotten steps or concepts, but long-term competence requires more than repeated exposure to concise information. Versteeg and colleagues' scoping review of spaced learning in health-professions education identified repeated educational encounters separated by time as a distinct approach intended to strengthen learning beyond massed instruction.

Clinical skill retention also depends on active performance. McGaghie and colleagues' meta-analysis found that simulation-based medical education incorporating deliberate practice was superior to traditional clinical education for selected skill-acquisition outcomes, with a pooled effect size of 0.71 across the included comparative studies. Although this evidence originated principally from medical education and should not be generalized mechanically to every allied health skill, the educational mechanism is relevant: learners improve when they repeatedly perform defined tasks, receive corrective feedback, and continue practice toward explicit standards. Physiotherapy-specific systematic reviews and trials similarly support simulation as a useful strategy for clinical preparation and decision-making. Mori, Carnahan, and Herold reviewed simulation learning experiences in entry-to-practice physical therapy curricula, while Sandoval-Cuellar and colleagues found improved physiotherapy decision-making following both simulated-patient and role-play interventions.

The present study therefore proposes a combined model rather than presenting point-of-care learning as a substitute for conventional education. In the model, foundational training establishes competence; point-of-care resources provide rapid task reactivation; spaced retrieval reduces forgetting; deliberate practice recalibrates procedural performance; and periodic reassessment determines whether competence has been retained. Because no original allied health data were provided, the analysis uses transparent simulated outcomes. The principal research question is whether a point-of-care plus spaced-practice architecture provides a theoretically stronger strategy for retaining allied health clinical skills than either one-time training or isolated point-of-care refreshers.

2. Objectives of the Study

2.1 To Examine Point-of-Care Learning as a Skill-Reactivation Strategy

The first objective is to examine point-of-care learning as an educational intervention designed to reactivate prior learning rather than teach complex clinical competence from the beginning. A point-of-care resource may remind a clinician of the sequence of an assessment, safety precautions, positioning requirements, equipment setup, a clinical decision pathway, or a procedure-specific checklist. Such resources are most defensible when the practitioner has previously achieved competence and needs a concise refresher before or during an infrequently encountered clinical situation.

The distinction is important for patient safety. A short video, checklist, or mobile resource should not be assumed to transform a novice into a competent practitioner immediately. Cook and colleagues' work on point-of-care resources focused on information retrieval during clinical work, not replacement of supervised clinical education. The present framework therefore treats point-of-care learning as one layer within continuing competence rather than as permission to perform unfamiliar high-risk procedures independently.

2.2 To Evaluate the Contribution of Spacing, Retrieval, and Feedback to Retention

The second objective is to determine whether point-of-care learning is theoretically more effective when combined with spaced retrieval and deliberate practice. Versteeg and colleagues found substantial variability in how spaced learning has been conceptualized across health-professions education but confirmed the importance of separating learning events through time rather than concentrating all exposure within one session. The present model incorporates brief retrieval episodes at scheduled intervals so that the learner must actively reconstruct the relevant knowledge rather than merely reread the same information.

Procedural skills additionally require feedback. McGaghie's meta-analysis and physiotherapy research on manual skill acquisition demonstrate why repetition without performance information may be insufficient. The proposed pathway therefore links digital refreshers with brief simulation, peer review, supervisor observation, or device-based feedback when the skill has a psychomotor component.

2.3 To Develop an Allied-Health-Oriented Retention Framework

The third objective is to develop a framework broad enough to accommodate the diversity of allied health practice without assuming that every discipline requires an identical learning strategy. A rehabilitation communication technique, manual physiotherapy procedure, swallowing-assessment

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protocol, respiratory intervention, imaging procedure, and assistive-technology setup differ substantially in risk, complexity, frequency, and feedback requirements. Point-of-care learning intensity should consequently be matched to the characteristics of the skill.

Physiotherapy studies demonstrate both the potential value and limitations of simulation. Hough and colleagues reported improved self-efficacy after simulation-based pediatric physiotherapy education, whereas Sandoval-Cuellar and colleagues demonstrated improvement in clinical decision-making through simulated interactions involving low-back-pain care. The proposed framework extends these principles to allied health while retaining profession-specific competency standards and supervision requirements.

3. Review of Literature

3.1 Skill Decay and the Limits of One-Time Competency Training

Skill acquisition and skill retention are related but distinct educational outcomes. A learner may perform successfully immediately after instruction because relevant information is highly accessible and feedback has recently corrected errors. The more consequential educational question is whether the same skill can still be performed accurately when weeks or months have passed without practice. Snodgrass and Odelli's physiotherapy study is particularly instructive because concurrent objective feedback improved the application of lumbar-mobilization forces, yet retention declined rapidly after feedback was withdrawn. This illustrates why immediate post-training competency scores should not be interpreted automatically as evidence of durable practice readiness.

The problem extends beyond manual techniques. Simulation-based education is widely used because it allows clinical skills and reasoning to be practiced under controlled conditions. Mori and colleagues' systematic review identified a growing role for simulation in physical therapy entry-to-practice curricula, while Pritchard and colleagues subsequently reviewed simulated-patient approaches within physical therapy education. These approaches improve opportunities for practice, but retention requires attention to what happens after the simulation ends.

Research on deliberate practice provides a theoretical mechanism for addressing decay. McGaghie and colleagues found simulation with deliberate practice superior to traditional clinical education for selected learning outcomes, while Taras and Everett described rapid-cycle deliberate practice as repeated cycles of task performance and directed feedback until progressively higher performance is achieved. The literature therefore supports a shift from “training completed” toward competence maintained as the more appropriate long-term educational objective.

3.2 Microlearning and Point-of-Care Knowledge Support

Point-of-care learning differs from conventional formal education because the clinical problem creates the immediate learning need. Cook and colleagues explored the characteristics clinicians considered important in point-of-care knowledge resources and identified features including rapid access, credibility, relevance, and effective organization. These characteristics become especially important when a practitioner needs to refresh knowledge within a busy clinical workflow.

Microlearning offers a compatible delivery structure. De Gagne and colleagues' scoping review found that microlearning had been used across health-professions education in diverse formats and generally demonstrated positive effects on learner knowledge and confidence. Triana and colleagues' 2021 quiz-based microlearning programme further illustrated the scalability of short digital education: participants included physicians, nurses, advanced-practice professionals, and allied health professionals. These studies support feasibility but do not establish that every brief digital educational intervention produces durable clinical skill retention.

That limitation is central to the present paper. Microlearning can reduce the effort required to access a focused refresher, but retention involves memory and performance processes extending beyond convenience. A clinician who watches a two-minute technique video immediately before performing a task may improve immediate recall without preserving proficiency for the next encounter several months later. Point-of-care learning should therefore be connected with longitudinal learning architecture rather than evaluated exclusively through immediate satisfaction or knowledge scores.

3.3 Spacing, Simulation, and Clinical Transfer

Spaced learning provides one means of distributing educational reinforcement across time. Versteeg and colleagues' review demonstrates that health-professions educators have applied spacing using several different schedules and instructional formats. Earlier work by Kerfoot and colleagues also demonstrated that spaced clinical scenarios distributed over time could improve retention of clinical knowledge relative to conventional approaches. Although knowledge retention and psychomotor retention are not identical, the spacing principle supports the repeated reactivation of skills before substantial forgetting occurs.

Simulation can provide the performance component missing from purely informational reinforcement. Hough and colleagues reported that simulation-based education improved physiotherapy students' self-efficacy in pediatric assessment and management. Sandoval-Cuellar and colleagues' randomized physiotherapy study found that both role-play and simulated-patient approaches improved clinical decision-making scores over the intervention period. These findings indicate that simulation can strengthen applied competence, although longer-term retention and clinical transfer require separate evaluation.

Evidence from deliberate-practice literature reinforces that distinction. Ng and colleagues' 2021 scoping review of rapid-cycle deliberate practice described repeated task performance with directed feedback until mastery of specified learning objectives. At the same time, surgical-skills research published before 2022 cautioned that evidence for retention beyond approximately one month remained comparatively limited in some deliberate-practice studies. A high-quality allied health retention model should therefore include delayed reassessment rather than assume that immediate mastery persists.

4. Research Methodology

4.1 Research Design and Simulated Allied Health Sample

The present study adopts a simulation-based longitudinal educational design. No allied health professionals were recruited, no clinical procedures were performed on patients, and no real competency records were accessed. Synthetic data were used because an empirical dataset was not supplied and because fictional professional outcomes should not be presented as completed research.

The simulated analytical sample contains 600 allied health practitioner profiles, distributed equally across three educational pathways. The professions represented conceptually include physiotherapy, occupational therapy, speech and language practice, respiratory care, rehabilitation practice, and other allied health roles requiring continuing clinical competence. These categories are illustrative and are not intended as a universal regulatory definition of allied health.

The educational follow-up period was modeled over 12 weeks with performance assessments at baseline, week 4, week 8, and week 12. All groups began with an equivalent mean skill-performance score of 86 following successful initial competency preparation.

4.2 Point-of-Care Retention Framework

The first pathway represented a conventional one-time workshop without planned reinforcement. The second pathway added a concise point-of-care refresher made available when the relevant clinical skill was expected to be performed. The third pathway combined the same point-of-care refresher with spaced retrieval exercises and brief deliberate-practice opportunities.

Table 1: Operational Framework for Allied Health Skill Retention

Construct	Operational Definition	Proposed Measure	Analytical Role
Initial Clinical Competence	Ability to perform the targeted skill to the required educational standard immediately after training	0–100	Baseline
Point-of-Care Learning Access	Availability of a concise, verified refresher near the time the skill is clinically relevant	Yes/No	Primary intervention
Retrieval Performance	Ability to reconstruct critical steps or reasoning without immediately viewing the answer	0–100	Retention mechanism
Deliberate Practice Exposure	Repeated performance with corrective feedback against defined criteria	Number of episodes	Retention mechanism
Skill Retention	Delayed performance of the clinical skill relative to initial competency	0–100	Primary outcome
Error Recognition	Ability to identify a performance deviation before it reaches the patient	0–100	Safety outcome
Transfer Readiness	Ability to apply retained knowledge or skill to a realistic clinical scenario	0–100	Secondary outcome

Source: Author-developed simulation framework informed by point-of-care learning, microlearning, spaced learning, physiotherapy simulation, and deliberate-practice evidence.

The framework deliberately includes escalation awareness because retention interventions should not encourage unsafe confidence. A clinician whose refresher reveals uncertainty in a high-risk skill should seek appropriate supervision or formal retraining rather than using the resource as justification to proceed independently.

4.3 Simulation and Analytical Procedure

Synthetic retention scores were specified according to three theoretically different trajectories. The one-time workshop condition was modeled with the greatest decline because no systematic reactivation followed initial training. The point-of-care condition was modeled with slower decline because relevant information became available near performance. The combined point-of-care plus spaced-retrieval condition was modeled with the strongest retention because learning was repeatedly retrieved before major decay and periodically linked to feedback.

The simulation does not assume that all allied health skills decay at the same rate. Motor procedures, diagnostic reasoning, equipment use, communication skills, and emergency responses would likely demonstrate different retention characteristics. The numerical values therefore represent a generic educational model rather than a profession-specific retention curve.

Descriptive analysis was selected instead of inferential significance testing. Artificially generated *p*-values would not provide evidence concerning real practitioners. A future empirical trial should employ profession-specific competency rubrics, delayed blinded assessment, clinical-transfer measures, and stratification according to how frequently each skill is used in practice.

5. Analysis

5.1 Simulated Twelve-Week Skill Retention

The simulated analysis shows substantial divergence among the three educational pathways despite identical baseline competence.

Table 2: Simulated Allied Health Skill-Retention Outcomes

Learning Pathway	Baseline	Week 4	Week 8	Week 12	Total Modeled Decline
One-Time Workshop	86	69	57	48	−38
Point-of-Care Refresher	86	78	73	70	−16
Point-of-Care + Spaced Retrieval	86	83	82	81	−5

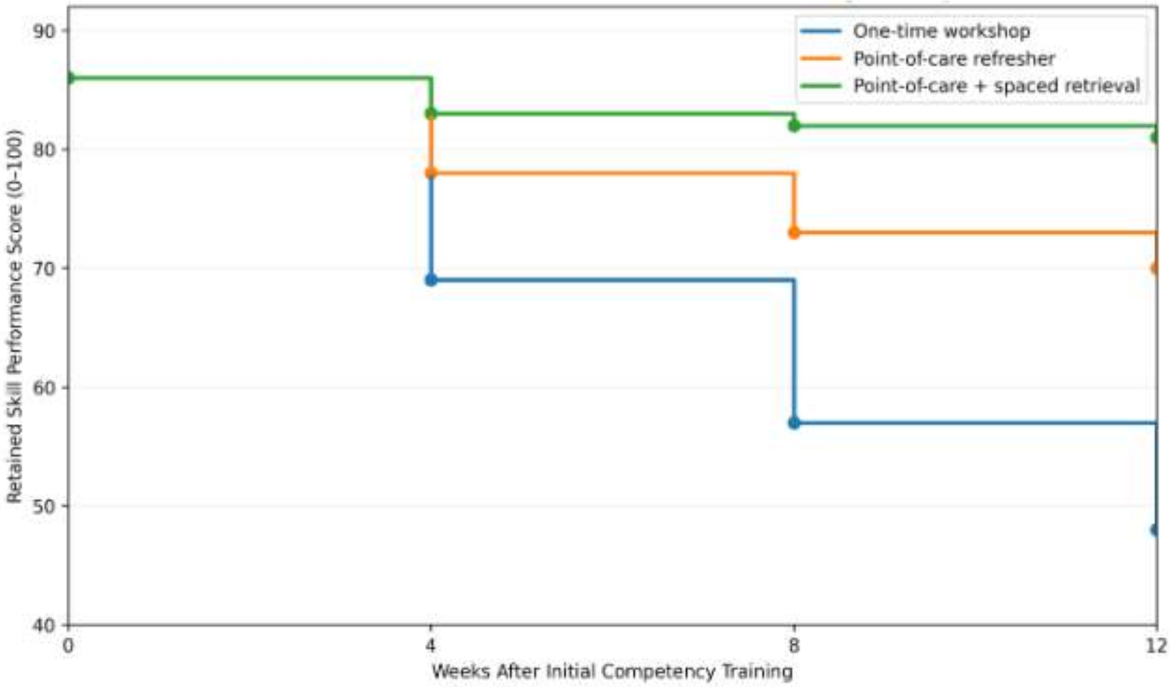
Source: Author-generated simulated data. The values are not empirical estimates of allied health skill decay.

The one-time workshop pathway demonstrates the greatest modeled decline, losing 38 performance points over 12 weeks. This pattern represents the educational risk of assuming that competence immediately following training remains stable without subsequent exposure.

The isolated point-of-care refresher performs substantially better, retaining a score of 70 at week 12. The combined pathway retains a score of 81, only five points below initial performance.

5.2 Longitudinal Retention Across Learning Pathways

Graph 1: Simulated Allied-Health Skill Retention Across Learning Pathways



Source: Author-generated synthetic data; modeled $n = 600$.

The step chart shows progressive deterioration in the one-time workshop condition, a slower decline when point-of-care refreshers are available, and comparatively stable performance when point-of-care support is supplemented by spaced retrieval.

The horizontal intervals are intentional because the simulation measures retention at discrete reassessment periods rather than pretending that continuous daily performance was observed.

Key Finding: Within the simulated model, point-of-care learning reduces skill decay, but the strongest retention occurs when immediate clinical refreshers are combined with repeated retrieval and deliberate practice rather than used as a standalone educational intervention.

5.3 Retention Versus Dependence on Decision Support

The apparent benefit of point-of-care learning raises an important interpretive question. A clinician who performs well only while looking continuously at a digital aid may demonstrate successful task support without demonstrating independent skill retention. These outcomes should not be confused.

The present model therefore defines retention as performance demonstrated during delayed reassessment rather than simply correct performance while the learning resource remains visible. This distinction is consistent with the wider educational concern that immediate instructional support can improve current performance without ensuring durable learning. Physiotherapy findings showing loss of skill after withdrawal of feedback are particularly relevant.

Point-of-care systems should consequently be evaluated through both supported performance and unsupported delayed performance. High-quality programmes should aim to reduce preventable error during current care while gradually strengthening the clinician's underlying competence rather than creating permanent dependence on prompts.

6. Discussion

6.1 Point-of-Care Learning Is Most Valuable as Reactivation, Not Replacement Training

The central implication of the study is that point-of-care learning should be positioned carefully within allied health education. A clinician who has already achieved competence may derive considerable value from a concise refresher immediately before an infrequently used assessment or procedure. The educational resource can restore task sequence, highlight safety checks, and reactivate clinically relevant reasoning without requiring the practitioner to repeat an entire formal course.

This interpretation aligns with Cook and colleagues' work showing that clinicians value efficient, credible, problem-oriented point-of-care information. It also fits the microlearning literature demonstrating the feasibility of concise educational formats across health professions. The point-of-care model is therefore particularly attractive for busy allied health services because education can be integrated into workflow rather than occurring exclusively in scheduled classroom periods.

The boundary should nevertheless remain clear. A two-minute refresher cannot replace supervised acquisition of a complex or high-risk skill. Institutions should categorize skills according to risk and determine which can be safely refreshed through point-of-care learning, which require simulation before reuse, and which require formal recertification or direct supervision.

6.2 Spaced Retrieval and Deliberate Practice Address the Retention Problem

The simulated difference between the point-of-care-only and combined pathways suggests that accessibility should not be confused with learning durability. A resource that is always available may reduce the need to remember a procedure completely, but organizations may still require clinicians to retain core emergency, safety, assessment, and reasoning skills independently.

Spaced learning provides a mechanism for interrupting forgetting by returning the learner to relevant material over time. Versteeg and colleagues' review demonstrates the substantial interest in this principle across health-professions education. Microlearning can make these repeated exposures manageable because each reinforcement episode can remain brief and focused.

Active performance remains especially important for psychomotor and integrated clinical skills. McGaghie and colleagues found strong educational benefits from deliberate-practice simulation, while physiotherapy research shows the usefulness of simulation for readiness, self-efficacy, and professional reasoning. Allied health services should therefore design retention programmes that move cyclically from short knowledge retrieval to actual performance, feedback, correction, and later reassessment.

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6.3 Implications for Allied Health Workforce Development

Point-of-care learning has organizational value because it may allow continuing professional development to become more responsive to real clinical exposure. Rather than requiring every clinician to complete the same refresher at the same interval, educational systems could identify infrequently used or high-consequence competencies and trigger targeted learning when relevant clinical situations recur. This should complement—not replace—mandatory competency requirements where regulation or patient safety requires formal assessment.

The approach could also generate useful learning analytics. Repeated requests for the same refresher may indicate that a skill is too infrequent to remain stable, that the learning resource is inadequate, or that clinicians need supervised practice. Conversely, successful retrieval and periodic competency reassessment may provide evidence that a less intensive refresher schedule is sufficient. Such use of learning data should support education rather than become punitive surveillance.

Equity and accessibility should also be incorporated. A point-of-care system that depends on high-speed internet, a particular personal device, or inaccessible video-only instruction may exclude some staff. Resources should be available through institutionally supported platforms, designed for rapid use, accessible to clinicians with differing learning and sensory needs, and reviewed regularly for clinical accuracy. Triana and colleagues' large-scale microlearning experience illustrates the feasibility of distributing concise digital education across heterogeneous healthcare professional groups, including allied health participants.

7. Conclusion

Point-of-care learning offers a plausible strategy for strengthening allied health skill retention because it places concise educational reinforcement close to the clinical moment in which knowledge or skill becomes relevant. Its value is particularly evident for competencies that have previously been learned successfully but are performed too infrequently to remain easily retrievable. Research available through 2021 supports the underlying components of this model: concise microlearning can support health-professions education, effective point-of-care resources prioritize rapid and clinically relevant information access, spaced learning is designed to improve durability, and deliberate-practice simulation strengthens selected clinical skills.

The simulation presented in this study illustrates how these components may interact. All three modeled pathways begin with a competency score of 86, but by week 12 the one-time workshop falls to 48, point-of-care refresher support retains 70, and a combined point-of-care plus spaced-retrieval pathway retains 81. These values are entirely synthetic and must not be cited as empirical allied health outcomes.

The principal theoretical contribution is the distinction between access to help, supported task performance, and retained competence. A clinician who can rapidly locate an instructional resource has better informational support, but this does not prove that the underlying skill has been retained. Retention should be demonstrated through delayed performance, appropriate reasoning, error recognition, and the ability to determine when additional supervision is necessary.

Future empirical research should examine profession-specific skills over meaningful follow-up periods and compare one-time training, task-triggered refreshers, spaced microlearning, and deliberate-practice reinforcement. Appropriate outcomes include delayed objective skill performance, procedural errors, clinical reasoning, confidence calibrated against competence, time required to access the learning resource, transfer to real practice, and patient-safety indicators. The strongest allied health learning system is therefore not one that forces clinicians to remember every detail indefinitely or one that makes them dependent on digital prompts. It is one that makes trustworthy learning available when needed while repeatedly strengthening the underlying competence required for safe independent practice.

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