

Remaining Qualified While Rarely Performing the Task: How Skill Decay, Rehearsal Opportunities, and Re-Entry Conditions Shape Readiness for Consequential Pharmacy Responsibilities

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Abstract

Professional qualification records that a pharmacist met defined expectations at a particular stage of training or assessment, but consequential responsibilities may subsequently be performed infrequently. The resulting question is temporal: when does prior qualification remain sufficient evidence of present readiness, and when does non-performance create uncertainty requiring rehearsal, reassessment, supervision, or structured re-entry? This conceptual article develops a Temporal Capability Framework for interpreting current readiness without assuming that skills decay uniformly or that elapsed time alone determines competence. The framework distinguishes historical qualification from current capability and treats readiness as a task-specific state shaped by retention characteristics, performance history, rehearsal and refresher exposure, task complexity, potential consequence, and the quality of current evidence. It further separates routine maintenance from re-entry after prolonged non-performance and argues that higher-consequence responsibilities justify stronger evidence of maintained capability when uncertainty is substantial. The framework does not propose universal inactivity thresholds. Instead, it establishes a conditional logic for judging when existing evidence remains adequate, when readiness is uncertain, and when capability should be reconstructed before independent task performance. This temporal approach allows credentialing, continuing professional development, and employer governance to address rarely performed responsibilities without equating qualification with permanent readiness or treating every lapse in task performance as equivalent evidence of decay.

Keywords: Skill decay, Pharmacy competence, Current readiness, Rehearsal, Re-entry, Continuing professional development

Introduction

Readiness for professional practice is commonly described through knowledge, skills, attitudes, confidence, and the capacity to function effectively in the relevant setting. Across health professions, however, readiness is not a single property that can be inferred from one educational milestone; it reflects preparedness

to perform the activities that a role presently demands [1]. This distinction becomes especially important after qualification. A pharmacist may remain legally or professionally qualified while rarely encountering a particular high-stakes responsibility. Historical evidence that the task was once learned remains relevant, but it does not answer by itself whether the capability required for safe, independent performance has been maintained. The problem is becoming more consequential as pharmacists assume broader clinical functions and greater autonomy. Expanded roles may involve prescribing, medication optimization, complex clinical judgment, urgent decision-making, or other activities in which the consequences of error differ substantially from those of routine work. Contemporary proposals for

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pharmacist-clinician roles therefore emphasize not only education but also governance, professional accountability, and the organizational conditions required for safe autonomous practice [2]. As scopes expand, a static equation between being qualified for a role and being currently ready for every responsibility within that role becomes increasingly difficult to defend. Continuing professional development offers one mechanism for maintaining capability, yet participation in development activities cannot itself establish that a rarely performed task remains executable at the required standard. Pharmacy development literature increasingly recognizes that learning, motivation, behavior, professional commitment, and translation into practice are related but distinct processes [3]. A practitioner can complete relevant education without subsequently performing the task, while another may retain capability through repeated real-world use despite comparatively little formal continuing education. The theoretical problem is therefore not whether learning matters, but how prior attainment, subsequent use or non-use, rehearsal, refresher exposure, current evidence, and task consequences should be interpreted together.

This article develops a Temporal Capability Framework for that problem. Its central premise is that readiness for consequential pharmacy responsibilities is a time-varying, task-specific judgment. The framework does not presume inevitable deterioration with every period of non-performance, nor does it treat time elapsed as a sufficient measure of capability. Instead, it asks what has happened to the capability since it was established, what evidence now exists about its preservation, and how much uncertainty is acceptable given the consequences of the task.

Why qualification does not guarantee current readiness

Qualification and current readiness answer different questions. Qualification indicates that a practitioner has satisfied specified educational, assessment, regulatory, or professional requirements. Current readiness asks whether that practitioner can now perform a particular responsibility at an acceptable level under the conditions in which performance is required. Competency-based pharmacy education increasingly emphasizes programmatic assessment, coaching, and institutional capacity to make defensible judgments about learner development [4]. Those developments reinforce an important point: competence must be evidenced through

performance and assessment rather than assumed solely from participation in a curriculum.

Pharmacy competency frameworks similarly provide valuable descriptions of expected professional performance, developmental progression, and practice-relevant behaviors. A systematic review of pharmacy-related competency frameworks found substantial international activity in defining competence across entry-to-practice, general practice, and advanced practice, while also identifying variability in terminology, construction, validation, and applicability [5]. Such frameworks can specify what pharmacists should be capable of doing, but they do not ordinarily establish that every previously demonstrated capability persists unchanged after long periods without use.

The developmental character of competence is also visible in contemporary global pharmacy frameworks. Revision of the FIP Global Competency Framework for early-career pharmacists was explicitly evidence-led and responsive to changes in professional practice, therapeutics, technology, and workforce expectations [6]. Likewise, advanced-practice frameworks may require adaptation to national or institutional contexts rather than mechanical transplantation across settings [7]. National clinical-pharmacy competency work has further shown that practice behaviors can be operationalized and validated for specific professional environments [8]. These developments strengthen competency standards while simultaneously demonstrating why a credential or framework descriptor should not be treated as a permanent measurement of current task performance.

The distinction is particularly important for rarely performed responsibilities. A qualification can remain valid even when the frequency, context, supporting technology, procedural sequence, or decision environment associated with a task changes. Historical competence therefore contributes to a readiness judgment without exhausting it. A pharmacist who has previously demonstrated a capability begins from a different position than a novice, yet the relevant question is whether the prior capability remains sufficiently available for the present task and its consequences. Temporal capability analysis begins at precisely this point: it preserves the value of qualification while refusing to treat qualification as temporally self-renewing evidence.

Skill retention and decay

The strongest reason to separate qualification from present readiness is that retained performance is not uniform across tasks or over time. A large meta-analytic review of procedural skill retention found that performance after non-use generally declines as retention intervals lengthen, but the extent of deterioration varies materially with task characteristics, complexity, intermittent performance, initial learning conditions, and how retained performance is measured [9-11]. This variability is theoretically more important for pharmacy than any single numerical estimate of decay. It indicates that “skill decay” should not be represented as one fixed process operating at an identical rate across all professional responsibilities.

Clinical evidence illustrates the same heterogeneity. Reviews of surgical skill decay identify time away from practice as relevant while emphasizing the modifying roles of procedural complexity, quality of initial learning, overlearning, opportunities for continued practice, and the particular technical capability being tested [12]. A systematic review across safety-critical professions similarly found that maintenance of competence depends on features of initial training, subsequent practice, refresher activity, individual characteristics, and task complexity [13]. Although these literatures cannot supply pharmacy-specific decay rates, they establish a defensible conceptual boundary: loss of capability after non-performance is plausible and often measurable, but neither its existence nor its magnitude can be inferred from elapsed time alone.

For a temporal framework, the useful analytical unit is therefore not “the qualified pharmacist after X months,” but the relationship between a specific capability and its post-acquisition history. Some responsibilities are repeatedly reinforced through adjacent activities even when the exact task is uncommon. Others contain procedural sequences or judgment demands that receive little incidental rehearsal. Some capabilities rely heavily on factual recall; others depend on coordinated psychomotor performance, pattern recognition, rapid escalation, communication under pressure, or integration of several information streams. These differences make a single decay function inappropriate.

The same reasoning applies within one apparently unified task. A practitioner may retain conceptual understanding while losing speed, sequence fluency, confidence, or the ability to manage unusual complications. Conversely, familiarity may remain high even when the underlying clinical environment has changed enough to make previously learned routines unsafe. Retention is therefore better treated as a profile of task-relevant capability than as a binary possession.

These distinctions produce an important analytical consequence for readiness assessment. Evidence of non-use should increase attention to potential decay, but its meaning depends on the capability being considered and the conditions under which it was acquired, maintained, or indirectly rehearsed. **Table 1** organizes those distinctions as a set of retention conditions rather than a timetable for presumed deterioration.

Table 1. Retention conditions that alter how prior pharmacy capability should be interpreted after infrequent task performance

Retention condition	What may remain relatively available	What may become uncertain	Why the distinction matters for readiness	Interpretation within temporal capability
Deep initial learning with demonstrated mastery	Core procedural sequence, conceptual schema, recognition of standard task demands	Speed, handling of uncommon complications, adaptation to changed local systems	Strong prior acquisition can support later retention but does not establish complete present performance	Historical evidence is comparatively strong, but current evidence may still be needed for consequential or altered tasks
Intermittent authentic task performance	Retrieval fluency, contextual cues, sequencing, practical judgment	Rare branches of the task or infrequently encountered complications	Occasional real performance can interrupt complete non-use and provide evidence unavailable from elapsed time alone	Non-performance interval should be reconstructed from actual exposure history rather than calendar time alone

Related but non-identical professional activity	Underlying concepts, adjacent decision routines, communication or assessment processes	Task-specific procedural integration and exact execution sequence	Transfer may preserve components of capability while leaving the target responsibility incompletely rehearsed	Adjacent work contributes evidence but should not automatically be counted as equivalent task performance
Structured rehearsal or refresher exposure	Retrieved knowledge, practiced sequence, recognition of task demands	Transfer to live performance, performance under pressure, management of atypical conditions	The value of rehearsal depends on fidelity, retrieval demand, feedback, and relationship to the target task	Rehearsal strengthens the evidence base only to the extent that it engages the capability required in practice
Prolonged non-use without meaningful rehearsal	Previously established conceptual knowledge may persist	Fluency, procedural coordination, recall accessibility, confidence, handling of complexity	Longer non-use can increase uncertainty, particularly for complex capabilities, without proving that competence has been lost	The appropriate state is increased uncertainty, not automatic classification as incapable
Task or practice environment materially changed since qualification	General professional principles and some transferable knowledge	Applicability of older routines, technology-specific actions, local decision pathways	Apparent retention of the old task may not equal readiness for the current version of the task	Reassessment must consider capability–environment fit as well as memory or procedural retention
High complexity with sparse opportunities for practice	Selected components may remain stable	Integration of multiple steps, exception handling, cognitive coordination	Complex capability may be more vulnerable to partial degradation and harder to infer from indirect evidence	Stronger current evidence or targeted rehearsal may be warranted before independent execution
Low observed use but strong current performance evidence	Demonstrated task capability at the time of assessment	Generalization beyond the assessed conditions	Direct current evidence can outweigh a simple inference from infrequency	State classification should respond to present evidence rather than lapse duration alone

The table deliberately avoids assigning durations or universal performance thresholds. The evidence supports heterogeneity in retention and identifies relevant modifiers; it does not support a pharmacy-wide timetable that converts a particular period of non-performance into presumed loss of competence.

Time since last performance

Time since last performance is intuitively attractive because it is easy to record. It may also carry useful information: longer periods without authentic task execution create more opportunity for forgetting, loss of fluency, environmental change, and weakening of procedural coordination. Yet the temporal interval is an exposure marker, not a direct measurement of retained capability. Two pharmacists who last performed the same responsibility at the same time may have very different current states if their original learning, subsequent related practice, rehearsal, and task environments differ.

Longitudinal simulation evidence illustrates why a deterministic clock is unsafe. Practicing endoscopists trained to a mastery standard demonstrated substantial

retention of measured polypectomy performance at later assessments, showing that meaningful competence can persist across intervals that might otherwise be treated simply as “time away” [14, 15]. The specific durations and procedures in those studies should not be translated into pharmacy policy. Their theoretical value is narrower and stronger: delayed assessment can produce retained performance, and training characteristics can influence what survives the interval.

The procedural-skill meta-analysis likewise found increasing decay with longer retention intervals while identifying substantial moderation by task characteristics and intermittent performance [9]. Reviews of technical skill loss similarly emphasize that initial learning conditions and the nature of the task alter later performance [12]. Consequently, time since performance should be interpreted as one element of the capability history. It can trigger a question, but it cannot answer that question by itself.

This distinction prevents two symmetrical errors. The first is false reassurance: assuming that a relatively short lapse guarantees readiness even when the task is

complex, consequential, or newly changed. The second is unnecessary restriction: treating a longer lapse as proof of incapacity despite strong evidence of retained competence, relevant rehearsal, or current successful performance. A temporal capability approach therefore asks what the interval contains. Calendar duration matters because it structures opportunities for use and forgetting; its meaning emerges only when those opportunities and the resulting evidence are examined.

Task complexity and consequence

Readiness decisions also depend on the task for which readiness is being claimed. Prospective entrustment research in health-professions education shows that decisions about permitting future independent performance are influenced by perceived risk and consequences, the quality and sufficiency of available performance information, and the decision-maker's confidence in the individual being assessed [16]. Although entrustment committees operate in a different context from qualified pharmacists returning to rarely performed responsibilities, the underlying decision principle is applicable: uncertainty that might be acceptable for one activity may be unacceptable for another when the consequences of error are substantially greater.

Task complexity and task consequence should nevertheless remain separate. Complexity concerns the cognitive, procedural, coordinative, or situational demands of performing the responsibility. Consequence concerns what may follow when performance is inadequate. A task can be complex yet buffered by supervision, redundancy, decision support, or opportunities to correct error before harm occurs. Conversely, an apparently routine task can carry serious consequences if a rare error is difficult to detect or reverse.

The Temporal Capability Framework therefore does not classify readiness from difficulty alone. Instead, complexity helps determine how vulnerable performance may be to partial loss and how demanding reconstruction could become, while consequence helps determine how much uncertainty can reasonably be tolerated before independent performance. Evidence of retained capability that would be adequate for a low-consequence activity may be insufficient for a responsibility involving substantial patient-safety risk, irreversible action, or little opportunity for correction.

This consequence-sensitive interpretation also avoids a punitive view of re-entry. Stronger assessment or supervised practice for a high-consequence responsibility does not imply that the practitioner has become incompetent. It means that the evidentiary burden for independent performance changes when uncertainty and consequence coexist.

Rehearsal and refresher opportunities

Periods between authentic performances are not necessarily periods of complete non-use. Capability can be engaged through simulation, case rehearsal, retrieval practice, supervised practice, deliberate review, structured refresher activity, or related professional work. The term "rehearsal," however, becomes analytically weak if every educational exposure is treated as equivalent. A scoping review of spaced learning in health-professions education found substantial variation in how spacing was conceptualized and implemented, including differences in timing, repetition, format, and theoretical grounding [17]. The relevant question is therefore not simply whether learning occurred between performances, but whether the activity exercised the capability that later must be available.

Evidence from continuing professional development and health-professions education supports the value of structured repetition while also cautioning against automatic transfer claims. Spaced education, distributed practice, retrieval practice, and spaced digital education have produced benefits across knowledge, skills, and professional behavior in many studies, but effects vary across designs and outcomes, and evidence of direct patient benefit is much more limited [18-20]. Rehearsal should consequently be evaluated by its functional relationship to the target responsibility.

Four features are especially relevant. First, rehearsal should require retrieval or performance rather than passive re-exposure when the target task depends on active recall or execution. Second, fidelity should be sufficient to engage the important components of the responsibility, particularly exception handling and decision points. Third, feedback should reveal error rather than merely confirm completion. Fourth, rehearsal should occur at intervals and in forms that are plausible for maintaining accessibility without implying that one schedule is universally optimal.

These distinctions separate rehearsal opportunity from rehearsal strength. A pharmacist may have abundant access to continuing education but little opportunity to

enact a rare capability. Another may encounter related tasks that repeatedly reinforce central components of the target responsibility. In temporal capability terms, both histories matter, but they should not be recorded as equivalent evidence. Rehearsal becomes valuable because it changes what can reasonably be inferred about current capability, not because attendance itself resets a clock.

Re-entry after prolonged non-performance

Re-entry becomes relevant when non-performance has lasted long enough, or uncertainty has become substantial enough, that ordinary maintenance activity no longer provides adequate evidence for independent execution. The available clinical literature suggests that return is not simply a personal act of resuming work. A qualitative study of anaesthetists returning after maternity leave found that successful return was shaped by planning, duration and circumstances of leave, workplace support, culture, confidence, and access to appropriate re-entry arrangements [21]. Although the setting differs from pharmacy, it demonstrates that non-performance and subsequent return are embedded in organizational conditions rather than reducible to an individual's memory.

Evidence on technical skill decay adds a complementary point: time away, task complexity, quality of prior learning, and opportunities for practice interact [12]. Safety-critical competence research likewise indicates that refresher activity, practice history, and task characteristics influence retention [13]. The implication for pharmacy is not that a particular duration should trigger mandatory retraining. It is that prolonged non-performance can increase uncertainty sufficiently to justify a more structured process for rebuilding evidence. Within the Temporal Capability Framework, re-entry therefore has two functions. The first is evidentiary. Observation, simulation, supervised execution, structured case work, or another task-appropriate assessment can clarify whether the capability has in fact been retained. The second is reconstructive. When performance is incomplete, refresher learning and supervised practice can restore components that have become less accessible or no longer fit the current practice environment. These functions should not be conflated: assessment can reveal a problem without

correcting it, while training can occur without establishing that independent performance has become appropriate.

The intensity of re-entry should consequently depend on more than lapse duration. A practitioner with strong prior mastery, intermittent related practice, recent high-fidelity rehearsal, and convincing current performance evidence may require little reconstruction even after an extended interval. A practitioner facing a changed, complex, high-consequence responsibility with little meaningful rehearsal may warrant a stronger evidentiary and supervisory pathway despite a shorter interval. These are proposed temporal decision principles rather than universal regulatory rules.

This approach preserves an important distinction between uncertainty and incapacity. Prolonged non-performance may make readiness uncertain; it does not by itself establish degradation. Re-entry should therefore be designed to reduce uncertainty and, where necessary, rebuild capability in proportion to the task and the available evidence. The next stage of the argument formalizes how qualification history, use and non-use, rehearsal, consequence, and current performance evidence can be integrated into explicit temporal capability states and transition conditions.

Development of the temporal capability framework

Pharmacy competency-based education describes development and assessment across professional capabilities, but it does not by itself resolve how previously established competence should be interpreted after long or uneven periods of use [22]. The Temporal Capability Framework adds that missing temporal layer. Current readiness is treated as a provisional state produced by the interaction of prior qualification, subsequent authentic task exposure, related practice, rehearsal or refresher activity, changes in the practice environment, and current evidence of performance.

The framework therefore rejects a uniform decay clock. Time matters because it changes the opportunity structure for rehearsal, forgetting, environmental change, and renewed performance; it does not independently determine capability. Task consequence modifies the evidentiary demand applied to the resulting uncertainty.

Figure 1 represents this history-sensitive logic.

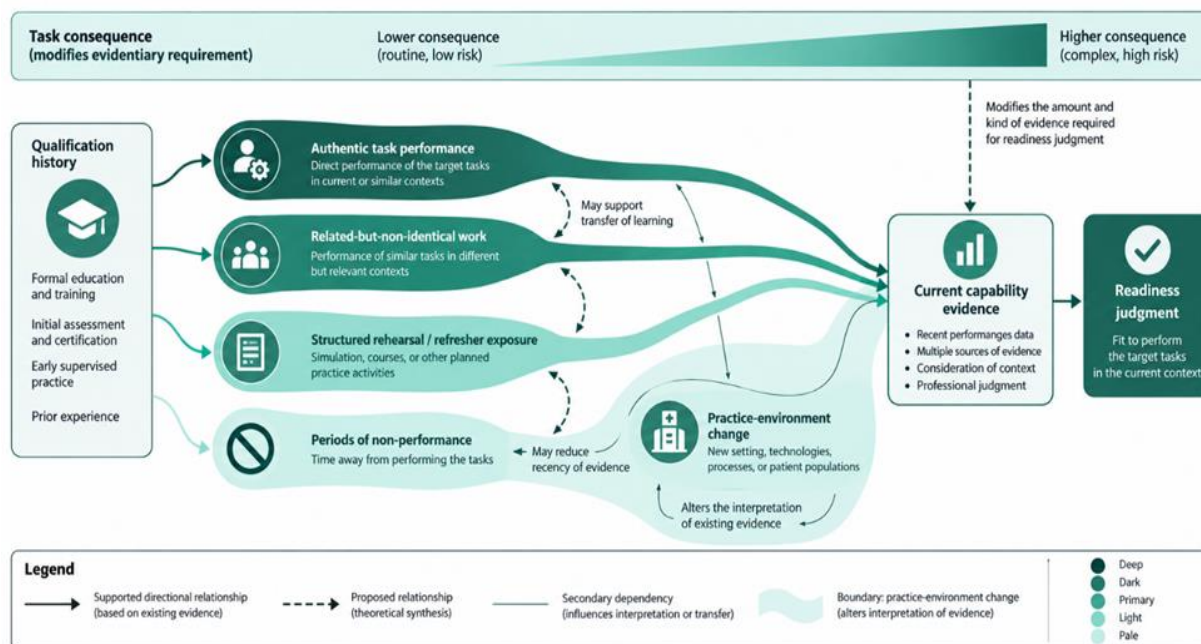


Figure 1. Temporal history of a qualified capability and the evidence required for a current readiness judgment

Capability states and transition conditions

Current capability should not be forced into a competent/incompetent binary. Pharmacy assessment research shows that self-assessment and external assessment may diverge, reinforcing the value of multiple evidence sources when competence is being judged[23]. The framework therefore distinguishes maintained readiness, uncertain readiness, degraded readiness, supervised re-entry, and reconstructed readiness as provisional analytical states rather than regulatory classifications.

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Movement between states requires meaningful new evidence or capability-modifying exposure. Passage of time may increase uncertainty, but it does not mechanically cause a transition. **Figure 2** depicts the resulting conditional state structure.

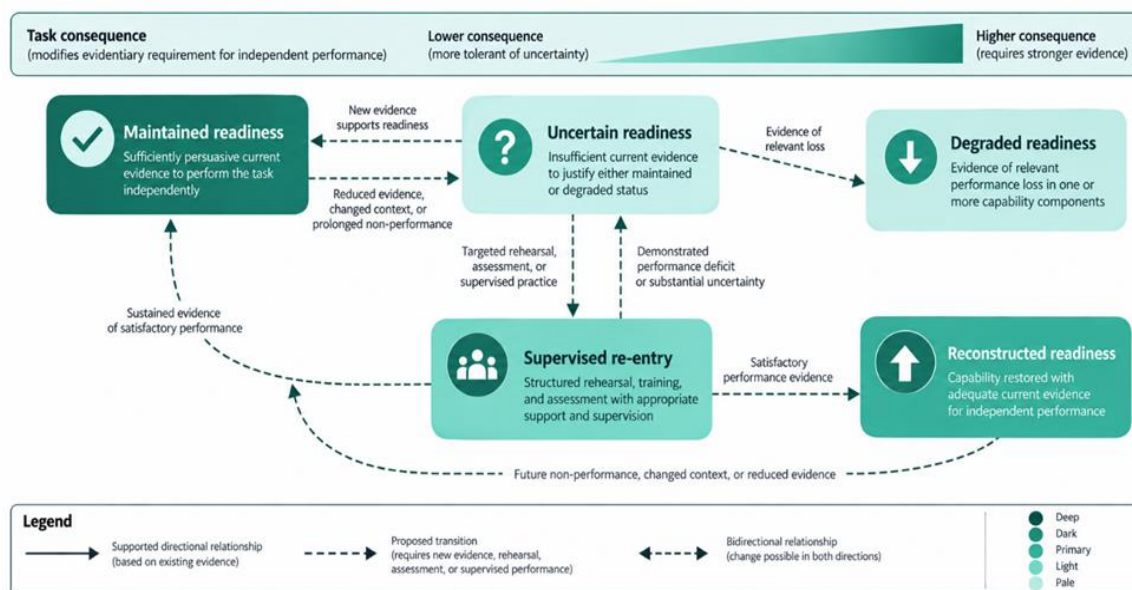


Figure 2. Conditional capability-state transitions after infrequent performance of a consequential pharmacy responsibility

Risk-tiered rehearsal and re-entry requirements

Pharmacy competency-development evidence indicates that assessment linked to identified learning needs and tailored development can improve measured competency behavior, although heterogeneity prevents conversion of those findings into universal re-entry thresholds[24]. Competency frameworks also require adaptation to professional and practice context [25]. The practical

implication is proportionality: stronger uncertainty combined with greater task consequence justifies stronger evidence-generation, rehearsal, or supervised re-entry.

When uncertainty and consequence are considered together, re-entry intensity changes across the decision conditions shown in **Table 2**.

Table 2. Consequence-sensitive responses to different temporal capability conditions

Temporal capability condition	Current evidence signal	Consequence-sensitive interpretation	Proportionate rehearsal or re-entry response	Independence status
Maintained capability with convincing recent evidence	Direct or strongly relevant current performance evidence	Residual temporal uncertainty is low	Routine maintenance and continued authentic exposure	Independent performance ordinarily defensible
Sparse recent use but meaningful rehearsal and credible current assessment	Evidence is supportive but task history is discontinuous	Interpretation depends on task consequence and assessment fidelity	Targeted rehearsal or confirmatory assessment where consequence is substantial	Conditional independence may be defensible
Prolonged non-performance with little task-relevant evidence	Capability status is uncertain	Uncertainty becomes more important as consequence rises	High-fidelity rehearsal, observed assessment, or supervised task exposure	Independent performance should await adequate evidence when consequence is high
Demonstrated loss in a relevant capability component	Evidence supports degradation rather than mere uncertainty	Historical qualification cannot substitute for present performance	Focused retraining followed by reassessment and supervised re-entry	Independent performance deferred
Capability restored after structured re-entry	New performance evidence supports reconstruction	Confidence depends on whether assessment matches the target responsibility	Continued monitored exposure until reconstruction is sufficiently established	Return to independence when current evidence is adequate

Implications for credentialing, employers and CPD

Continuing pharmacy education and professional development systems remain central to maintaining an evolving workforce, but participation records should not be treated as direct evidence of current readiness for every rarely performed responsibility[26]. Recent analysis of continuing-education provision also shows that activities labelled as professional development do not always operationalize a complete developmental cycle[27].

Credentialing bodies and employers could therefore separate renewal of professional status from task-specific evidence of current readiness where responsibilities are both infrequent and consequential. Learning needs already vary across pharmacist roles and settings[28]. Multimodal assessment approaches used elsewhere in pharmacy further illustrate that competence judgments need not depend on a single evidence source[29]. A temporal record could consequently document

meaningful task exposure, relevant rehearsal, assessment, and supervised re-entry without converting CPD into a universal time-based recertification rule.

Research agenda

The framework generates several discriminating tests. Pharmacy-specific longitudinal studies should compare equal non-performance intervals under different rehearsal histories and determine whether current performance is predicted better by lapse duration or by the combined history of acquisition, authentic exposure, rehearsal, and assessment. The moderating role of task complexity identified in broader skill-retention research should also be tested directly within pharmacy[9].

Research should distinguish retention from rapid relearning, because a practitioner who can quickly reconstruct a capability is theoretically different from one whose capability remained continuously available. Studies should also compare blanket time-based re-entry rules with consequence- and evidence-sensitive

approaches, including whether stronger organizational support changes the relationship between individual retained capability and safe task execution[16].

Results and Discussion

The Temporal Capability Framework extends pharmacy competence theory by treating qualification as historical evidence within an evolving capability state. Its distinctive claim is not that professional skills inevitably decay after a particular interval. The claim is that readiness judgments become less defensible when they ignore what has happened between qualification and present performance.

The strongest rival explanation is organizational scaffolding. Supervision, decision support, team redundancy, technology, and task redesign may allow safe service delivery even when unaided individual capability is uncertain. Re-entry research demonstrates that workplace arrangements materially shape return to practice[21]. The framework therefore distinguishes individual capability from system-supported safe execution rather than attributing every performance difference to personal decay.

Important limitations remain. Much of the direct retention literature comes from procedural, medical, simulation, or safety-critical contexts rather than pharmacy. The evidence does not provide pharmacy-specific decay curves, universal rehearsal schedules, or validated state-transition thresholds. Measurement itself can also change the apparent capability state. Accordingly, the framework should be tested as a decision logic, not implemented as a disguised timetable for automatic retraining.

Conclusion

Remaining qualified after long periods of rarely performing a task does not establish either preserved readiness or lost competence. Current readiness is better understood as a task-specific temporal state informed by prior qualification, subsequent use or non-use, meaningful rehearsal, current performance evidence, changes in the practice environment, and the consequences of error. Elapsed time can raise a legitimate question about retained capability, but it cannot answer that question independently. For consequential pharmacy responsibilities, the defensible response to uncertainty is therefore proportionate

evidence generation, rehearsal, assessment, or supervised re-entry rather than an arbitrary lapse threshold. Qualification remains important, but readiness must be judged from what the practitioner can credibly be expected to do now.

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