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Learning to Notice before Learning to Intervene: A Theoretical Framework for Developing Perceptual Expertise and Contextual Symptom Interpretation in Undergraduate Palliative Nursing Education

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Abstract

To develop an educational theory explaining how undergraduate nursing students may learn to notice clinically meaningful cues, interpret them in patient-specific context, and select proportionate responses in palliative care without reducing clinical judgment to factual recall or an unvalidated developmental scale. Original non-empirical educational theory informed by critically selected nursing-education, clinical-reasoning, palliative-care and assessment scholarship. Peer-reviewed literature published from 2017 to 2024 was used to examine clinical noticing, situation awareness, contextual interpretation, palliative and end-of-life learning, simulation, reflective debriefing and clinical-judgment assessment. Evidence was interpreted according to the type of claim each source could support rather than treated as a systematic-review corpus. Perceptual expertise is conceptualized as a recursive educational capacity involving five distinguishable functions: noticing, cue contextualization, interpretation, action selection and reflective calibration. Their relationship is conditional rather than a validated sequence of proficiency levels. Patient trajectory, preferences, relational circumstances, learner history, emotional salience and uncertainty can change what a cue means and how urgently action is warranted. Reflection becomes educationally valuable when it recalibrates subsequent perception and interpretation. Undergraduate palliative nursing education should make interpretation itself an explicit object of learning. Students need repeated, supervised opportunities to distinguish seeing a cue from understanding its significance, to tolerate uncertainty without unnecessary delay, and to revise judgment when patient context changes.

Keywords: Palliative care, Nursing education, Clinical judgment, Perceptual expertise, Symptom assessment, Reflective learning

Introduction

Undergraduate preparation for palliative care is frequently expected to cover symptom management, communication, psychosocial care and end-of-life decision making, yet curricular content and the strength of supporting educational evidence remain uneven [1]. This matters because possession of relevant knowledge does not ensure that a learner will recognize when that knowledge applies. A meta-analysis of nursing students' end-of-life preparation found that limited knowledge can coexist with comparatively favourable attitudes toward care of dying people, illustrating that willingness, factual understanding and practice readiness are related but non-equivalent educational outcomes [2]. Multicentre evidence likewise indicates that palliative-care knowledge and

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attitudes vary with educational and experiential circumstances, making context difficult to treat as a peripheral variable [3].

A central educational problem therefore precedes intervention choice: the learner must first notice what deserves attention and understand what that observation means for this patient, at this moment, within this trajectory of illness and care. In palliative nursing, a visible or reported symptom may reflect disease progression, treatment effects, anxiety, family interaction, fatigue, altered goals, accumulated burden or several processes simultaneously. The same observable cue can consequently warrant different responses across patients and time.

This article develops Perceptual Expertise Educational Theory as an account of that pre-intervention work. Perceptual expertise is defined here as the developing capacity to make relevant patient cues available to attention, place those cues within clinical and personal context, construct a defensible interpretation, select an appropriately proportionate response, and use subsequent experience to recalibrate future perception. These functions are analytically distinguishable but are not proposed as a validated staircase through which every student progresses in the same order. Their educational significance lies in making visible forms of judgment that can otherwise remain hidden behind correct or incorrect actions.

The theory consequently examines a question narrower than general clinical competence but broader than symptom recognition alone: how can undergraduate palliative nursing education cultivate the ability to notice before committing to an interpretation or intervention, while preserving responsiveness when safety demands immediate action? The answer requires attention to clinical reasoning, situated learning, palliative-care experience, ambiguity, emotional and ethical context, reflective learning and the limits of available assessment methods.

Background

Clinical noticing is not passive reception of information. Situation-awareness scholarship in undergraduate nursing education treats recognition of changing clinical information as an active educational problem involving attention, comprehension and anticipation [4]. Work defining clinical-reasoning competencies similarly identifies awareness of cues, confirmation of the clinical problem, action and subsequent evaluation or reflection as interdependent aspects of nursing judgment [5]. These traditions establish that a cue becomes useful only when it is selected from competing information and related to a developing account of what is happening.

Selection itself is context-sensitive. In a multicountry study using a simulated older person with delirium, characteristics of students' prior background influenced what they noticed and how they interpreted the situation, but the pattern was not sufficiently simple to justify deterministic assumptions about particular learner groups [6]. Perceptual education must therefore account for prior experience without converting demographic or educational history into a surrogate measure of ability.

Clinical decision-making research also suggests that students do not rely exclusively on either analytic calculation or intuition. Their reasoning can draw simultaneously on patient circumstances, accumulated experience, systematic processing and interpersonal resources [7]. For palliative education this is especially important because symptom interpretation is rarely separable from the patient's account of suffering, goals, relationships and changing tolerance of intervention. Educational designs that teach isolated cue-response pairings risk making recognition appear more stable than it is in practice.

Simulation can create protected opportunities to encounter cues and compare interpretations, but current evidence does not justify treating simulation exposure itself as perceptual expertise. A systematic review of simulation for undergraduate clinical reasoning found considerable heterogeneity in definitions, educational designs and measured outcomes, with stronger support for deliberate and repeated learning opportunities than for a simple exposure-effect assumption [8]. Simulation is therefore best understood as one environment in which perceptual work may become observable.

Palliative and end-of-life encounters add a distinctive relational and emotional layer. A realist review of nursing students' first experiences of patient death showed that clinical contexts and role models can expose students to contradictory messages about how death should be understood and managed [9]. A qualitative synthesis of student experiences in palliative and end-of-life care similarly identified problems of preparedness, emotional burden and support [10]. Direct placement in a palliative-care unit can help students encounter care as holistic and relational, but such experience remains situated rather than automatically generalizable [11]. Attitudes toward end-of-life care also vary with educational and experiential background, reinforcing the difference between favourable orientation and demonstrated clinical judgment [12].

These findings support a working distinction among five educational functions. Noticing concerns what enters focused attention. Cue contextualization asks whose cue it is, when it occurs, what preceded it and what the patient considers important. Interpretation links the contextualized cue to plausible meanings while keeping alternatives available. Action selection concerns what response is proportionate to the current interpretation and level of urgency. Reflective calibration uses consequences, feedback and reconsideration to modify how future cues are noticed and interpreted. The distinction is educational, not psychometric: the five functions should not be read as validated levels of competence.

The synthesis of these background findings is captured in **Table 1**, which separates observable educational functions from the kinds of learning outcomes that would indicate progress without assigning numerical proficiency levels.

Table 1. Perceptual competencies and educational outcomes for context-sensitive palliative nursing judgment

Perceptual function	Central learner task	Context that must remain visible	Educationally observable evidence	Common interpretive vulnerability	Intended learning outcome
Noticing	Identify potentially meaningful change without treating every available datum as equally salient	Patient trajectory, baseline state and immediate care situation	Learner identifies relevant cues and explains why they warrant attention	Missing subtle change or over-attending to visually prominent but weakly relevant information	More discriminating allocation of attention
Cue contextualization	Locate a cue within patient-specific clinical, relational and temporal circumstances	Patient priorities, illness phase, recent interventions, communication and family context	Learner actively seeks information needed to interpret the cue	Treating an isolated observation as self-explanatory	Context becomes part of the cue's meaning
Interpretation	Compare plausible explanations and identify uncertainty	Alternative causes, conflicting information and trajectory	Learner articulates more than one plausible interpretation when evidence is incomplete	Premature closure on the first familiar explanation	Reasoned interpretation with explicit uncertainty
Action selection	Choose a response proportionate to urgency and current understanding	Safety, reversibility, patient preference and available supervision	Learner links action to the interpretation and states what would trigger revision	Acting automatically because a cue resembles a memorized pattern	Proportionate and revisable response selection
Reflective calibration	Reconsider how the cue was noticed and interpreted after outcome or feedback	Consequences, feedback, missed information and changing patient state	Learner identifies how future attention or interpretation should change	Reflection limited to whether the final action was technically correct	Revision of future perceptual and interpretive habits

Data sources

This theoretical development used a critically selected evidence base rather than a systematic-review design. Sources published between 2017 and 2024 were chosen because they addressed at least one necessary component of the argument: palliative or end-of-life nursing education, clinical noticing, situation awareness, clinical reasoning or judgment, simulation, reflective learning, student experience, or assessment. Evidence from adjacent general nursing education was retained only when its function could reasonably inform how perceptual and interpretive learning might occur in undergraduate palliative nursing.

The evidence was treated according to design and inferential reach. A systematic review of high-fidelity simulation provides support for examining simulation as a context in which clinical-reasoning skills may be practised, while remaining cautious about claims of durable expertise [13]. A mixed-method palliative-care educational study adds domain-specific evidence that clinical modelling, simulation and debriefing can support communication and palliative learning, but its small uncontrolled design does not establish an optimal educational sequence [14].

Teaching and assessment sources were also separated. An integrative review of clinical-education strategies indicates that clinical judgment can be deliberately supported through purposeful educational approaches rather than expected to emerge solely through exposure [15]. Assessment evidence, however, shows substantial conceptual heterogeneity in how clinical judgment, clinical reasoning and critical thinking are measured across nursing education [16]. A systematic review of clinical judgment and decision-making assessment further suggests advantages to multiple and repeated observations of performance, while warning that self-assessment can diverge from externally observed competence [17].

Accordingly, the present theory does not treat one test score, simulation performance or reflective statement as proof of perceptual expertise. Evidence is used instead to identify educationally plausible relationships, boundaries and observable manifestations requiring later empirical validation.

The resulting synthesis suggests that perceptual expertise should be represented as a recursive system rather than a one-directional competency ladder, as shown in **Figure 1**.

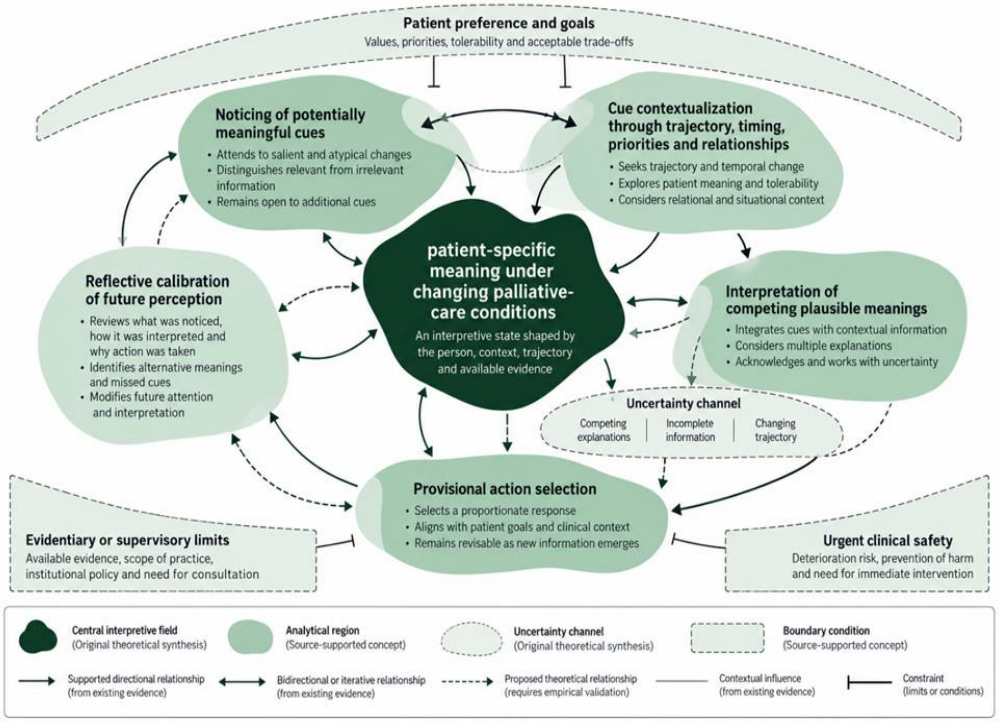


Figure 1. Recursive development of perceptual expertise around patient-specific meaning in undergraduate palliative nursing

Overview of the issues

The educational challenge becomes clearer when attention shifts from whether students have encountered palliative-care content to how they interpret ambiguous clinical situations. Students' own assessments of palliative-care education indicate uneven perceived need across content and competency areas [18]. These perceptions can help identify curricular blind spots, but they cannot by themselves define what patients require or what competent practice entails.

Affective orientation also changes how learners approach death and dying. Multicentre evidence indicates an association between students' attitudes toward death and their expressed needs for death education [19]. In this sense, emotion is not merely an obstacle to reasoning; it may influence which cues are approached, avoided or given disproportionate weight. Educational design must therefore create ways to examine emotionally salient interpretations without assuming that emotional distance is synonymous with expertise.

Simulation further demonstrates how identical educational material can function differently across learners. Nursing students participating in palliative and end-of-life simulation have described prior clinical or personal experience and expert facilitation as important influences on learning [20]. A cue presented in a simulated scenario therefore does not arrive in an empty cognitive space. Previous encounters, expectations and the credibility of supervision can change what is noticed and how confidently it is interpreted.

Patient population and care context add another source of variation. Undergraduate children's nursing students describing end-of-life care reported emotional and support needs that remain closely connected to the particular demands of paediatric dying [21]. Reflections from students caring for people approaching the end of life also emphasize dignity as a relational phenomenon rather than a purely technical attribute of care.[22] Cross-sectional evidence linking hospice-care competence with death-coping ability provides an additional reminder that perceived competence and personal orientation may be related, although the direction of that relationship cannot be established from such data [23].

Three recurring educational problems follow. First, cue detection can occur without contextual understanding: the student notices pain, agitation, reduced intake or withdrawal but has not yet examined trajectory, preference or recent change. Second, context can be collected without disciplined interpretation: information accumulates while the learner remains unable to compare plausible explanations. Third, action can close interpretation prematurely: recognition of a familiar cue triggers a familiar intervention before uncertainty, patient meaning or competing explanations have been sufficiently considered.

The phrase *learning to notice before learning to intervene* therefore describes an educational priority, not an instruction to delay urgent care. Immediate safety measures may be required before uncertainty is resolved. The educational question is whether the learner understands why action is urgent, which interpretation currently justifies it, what information remains missing and what observations would require the plan to change.
Table 2 translates these problems into teaching responses without assuming that any single educational modality represents a universally superior method.

Table 2. Teaching responses to recurrent perceptual and interpretive difficulties in palliative nursing education

Learner pattern	Developmental function requiring attention	Teaching response	Educator or supervisor role	Evidence of educational progress	Boundary that must remain explicit
Relevant cues are overlooked or indiscriminately collected	Noticing	Comparative cases with deliberately varied salient and non-salient information	Ask learners to justify what deserves attention before discussing intervention	Greater discrimination in cue selection and explanation of relevance	Absence of a noticed cue must not be equated automatically with negligence
A cue is recognized but treated as self-explanatory	Cue contextualization	Require comparison with baseline, trajectory, patient report and recent interventions	Redirect questions from "What is the symptom?" to "What does it mean here?"	Learner actively seeks context before stabilizing an interpretation	Urgent deterioration may require action while contextual inquiry continues
One plausible explanation dominates too early	Interpretation	Use competing-explanation prompts and cases containing ambiguity or discordant information	Require at least one alternative interpretation when uncertainty is genuine	Learner distinguishes evidence favouring one explanation from unresolved alternatives	Alternatives should not be generated mechanically when evidence is clear
A familiar intervention follows automatically from a familiar cue	Action selection	Ask learners to state the rationale, intended benefit, reversibility and trigger for reassessment	Make the connection between interpretation and action explicit	Selected action is proportionate and revisable	Patient goals and immediate safety can constrain available choices
Reflection focuses only on whether the final intervention "worked"	Reflective calibration	Debrief the attentional and interpretive process, including missed cues and assumptions	Help learners compare initial perception with later information	Learner specifies what should be noticed or interpreted differently next time	Retrospective certainty must not erase genuine uncertainty present at the time

Conceptual findings
The evidence supports a theory in which perceptual expertise develops through recurrent relationships among five educational functions rather than through accumulation of isolated symptom-response rules. Virtual clinical simulation can provide opportunities to practise palliative-care knowledge, ability and attitudes [24], but the theoretical value of such practice lies in what the learner is required to perceive, compare and revise. A realistic scenario alone does not specify the perceptual work that learning should accomplish.
Noticing is the first distinguishable function because information that never becomes salient cannot be contextualized or interpreted. Yet noticing is not equivalent to identifying a predetermined "correct cue." Perceptual expertise involves discrimination: learners gradually become more capable of distinguishing information that may alter understanding of the patient's state from information that is currently peripheral. What counts as relevant remains dependent on clinical trajectory and purpose.
Cue contextualization transforms an observation from an isolated datum into information about a particular person. The educational move is from "the patient is restless" to questions such as whether restlessness is new, whether pain or dyspnoea has changed, whether communication is impaired, whether medication has recently changed, whether family distress is influencing the encounter, and what the patient currently prioritizes. Context does not simply add detail; it can change the meaning of the original cue.
Interpretation requires learners to relate contextualized cues to plausible explanations while resisting unnecessary closure. This function is important because educational realism by itself does not guarantee better judgment. In a

comparative study of simulation-based case studies and lecture, both groups improved, but the simulation group did not show a significant between-group advantage in clinical judgment [25]. The finding challenges a simple assumption that active or technologically rich teaching automatically produces superior reasoning. Educational design must expose and develop the interpretive operation itself.

Action selection follows from interpretation but remains provisional. Work with second-degree baccalaureate students suggests that case scenarios combined with an explicit clinical-judgment approach can help learners organize reasoning [26]. Within the present theory, the important educational relationship is that an action should remain intelligibly connected to the interpretation supporting it. Students should be able to explain why this response is proportionate now, what patient preference or safety concern constrains the choice, and what new information would require reconsideration.

Action can also generate new information, making the theory recursive. Unfolding case studies provide a useful educational analogue because information changes over time and students must respond to a developing situation rather than a completed vignette [27]. This dynamic exposes a central characteristic of palliative symptom interpretation: a cue's significance can change as illness progresses, interventions take effect, goals shift or new relational information becomes available. Interpretation therefore remains revisable after action has begun.

The fifth function, reflective calibration, extends reflection beyond retrospective judgment about whether a response was correct. Design-based research on debriefing for clinical reasoning shows how structured discussion can connect patient experiences with prior knowledge and support development of richer reasoning structures, while leaving questions about transfer to practice open [28]. Calibration, as used here, means examining how attention and interpretation should change in future encounters. A learner may conclude that a subtle cue deserved earlier attention, that an initially compelling explanation received excessive weight, or that patient-reported meaning should have altered the clinical frame sooner.

These functions create a recursive educational relationship. Noticing provides candidate information; contextualization changes what the information signifies; interpretation constructs a defensible account while preserving uncertainty; action tests or responds to that account; and reflection modifies later noticing and interpretation. The relationship is developmental because repeated experience may reorganize how learners allocate attention and compare meanings, but it is **not** a claim that every learner moves through five fixed stages.

The theory also has an explicit safety boundary. “Notice before intervene” cannot mean that a student waits for interpretive completeness during acute deterioration. Nursing action can legitimately precede full explanation when immediate safety requires it. Perceptual expertise is demonstrated in such circumstances by recognizing the urgency, initiating proportionate action, continuing contextual assessment and remaining prepared to revise the interpretation as new information appears.

A second boundary concerns patient preference. Palliative symptoms are not meaningful solely because of their observable intensity. A symptom can become more or less significant according to the patient's priorities, tolerance, communication, goals and competing burdens. Contextual interpretation therefore prevents perceptual expertise from becoming a sophisticated form of clinician-centred pattern recognition.

Finally, the framework distinguishes educational observability from validation. Educators can observe whether students identify relevant cues, request contextual information, articulate competing interpretations, justify a provisional response and reconsider their reasoning after feedback. Those observations can support learning and supervision. They do not yet establish a validated instrument, developmental scale or prediction of patient outcomes. The proposed theory should therefore be used as a structure for curriculum design and empirical testing, not as a high-stakes scoring system.

Results and Discussion

Perceptual expertise has practical value only if curriculum design repeatedly exposes students to the work that occurs between observing a symptom and selecting a response. Problem-based learning integrated with the nursing process can support clinical reasoning and communication [29], but the present theory does not depend on one pedagogical format. Case discussion, simulation, bedside supervision and structured reflection can all contribute when learners must justify what they noticed, identify missing context and explain why a proposed action follows from the current interpretation.

Developmental language requires particular caution. Students' engagement with end-of-life education can change with experience, and qualitative research has described differing patterns of preparedness and engagement [30]. Such findings make development plausible without validating the five functions proposed here as sequential proficiency levels. Learners may contextualize some cues effectively while missing others, act appropriately despite incomplete explanations, or revisit an earlier interpretation when circumstances change.

Reflective learning is most useful when it changes subsequent perception. Reflective debriefing after deterioration simulation has been associated with development of clinical judgment [31], supporting educational attention to how an interpretation was constructed. Debriefing should therefore examine missed cues, assumptions, alternative

meanings and the point at which action was selected, rather than limiting reflection to whether the final intervention succeeded.

Assessment requires the same separation of functions. Relationships among palliative-care knowledge, experience, self-awareness and observed simulation performance indicate that these learner characteristics are connected but non-equivalent [32]. Assessment should consequently combine observable reasoning, contextual inquiry, action justification and reflective revision rather than infer expertise from one score or self-report.

Table 3 presents observable indicators for assessing context-sensitive perceptual judgment without converting the theory into a proficiency scale.

Table 3. Observable indicators for assessing context-sensitive perceptual judgment without converting the theory into a proficiency scale

Assessment focus	Observable learner evidence	Evidence that remains insufficient alone	Appropriate educator inference
Noticing	Identifies clinically relevant change and explains its salience	Number of cues listed	Attention is becoming more discriminating
Contextualization	Seeks trajectory, preference and situational information	Repeating collected history	Cue meaning is being individualized
Interpretation	Compares plausible meanings and states uncertainty	Naming one diagnosis quickly	Alternatives are being evaluated
Action selection	Links response to urgency, goals and current interpretation	Technically correct action alone	Action is reasoned and revisable
Reflective calibration	Identifies how future attention or interpretation should change	Generic statement that reflection was helpful	Experience is being used to modify later judgment

Longitudinal validation remains necessary. Current clinical-judgment assessment uses heterogeneous constructs and instruments [16], and systematic assessment research does not justify treating a single observation as stable competence [17]. The absence of a clear simulation advantage in some comparative evidence further cautions against equating educational activity with expertise [25]. Even carefully designed debriefing research leaves transfer from educational reasoning to independent practice incompletely established [28]. Future testing should therefore examine repeated performance across settings, assessor agreement, responsiveness to changing context and transfer into supervised clinical practice.

The resulting contextual interpretation logic is summarized in **Figure 2**.

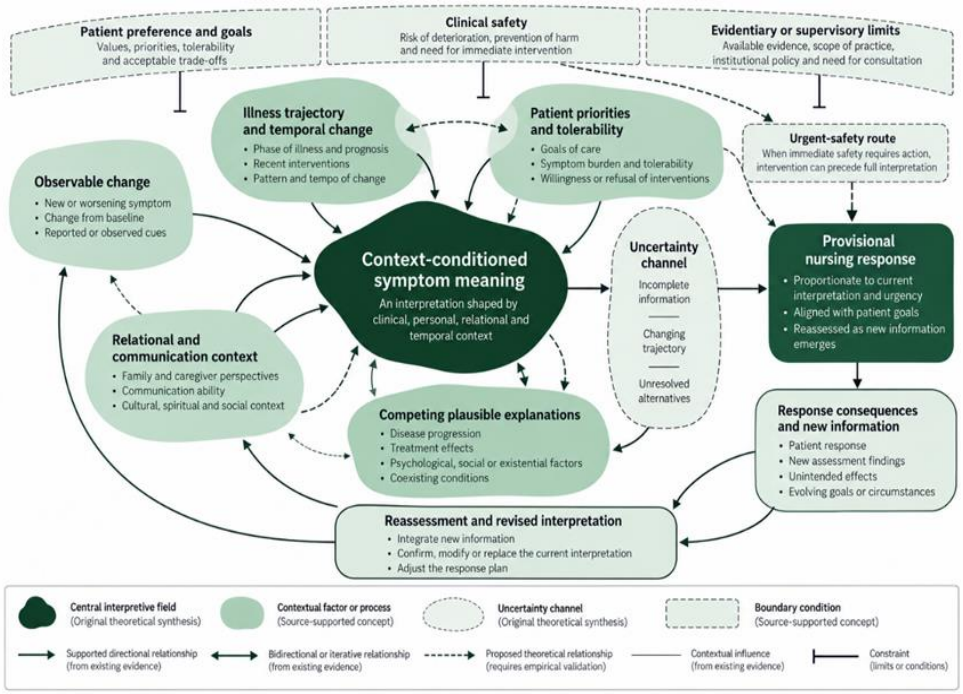


Figure 2. Context-conditioned interpretation of palliative symptoms across observation, patient meaning, uncertainty and response

Conclusion

Perceptual expertise in undergraduate palliative nursing should be understood as the capacity to notice clinically meaningful information, contextualize it, construct a defensible interpretation, select a proportionate response and recalibrate future judgment through reflection. These functions are recursive and context-dependent rather than validated stages. Education should therefore make the interpretive work preceding and accompanying intervention visible, teach students to tolerate appropriate uncertainty, and preserve patient meaning alongside clinical urgency. Empirical validation is required before the theory is used as a developmental scale or high-stakes assessment framework.

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