



INSTRUCTOR RESOURCES

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THE AIMS OF THIS RESOURCE PACKAGE

The aims of these resources are to:

- Define the process of clinical reasoning
- Explain and justify why nursing students need to learn clinical reasoning
- Describe and exemplify the process of clinical reasoning

WHAT IS CLINICAL REASONING?

In the literature the terms clinical reasoning, clinical judgment, problem solving, decision making and critical thinking are often used interchangeably. In this learning package we use the term clinical reasoning to describe the process by which nurses (and other clinicians) collect cues, process the information, come to an understanding of a patient problem or situation, plan and implement interventions, evaluate outcomes, and reflect on and learn from the process (Hoffman, 2007; Kraischsk & Anthony, 2001; Laurie et al., 2001). The clinical reasoning process is dependent upon a critical thinking 'disposition' (Scheffer & Rubenfeld, 2000) and is influenced by a person's attitude, philosophical perspective and preconceptions (McCarthy, 2003). Clinical reasoning is not a linear process but can be conceptualised as a series or spiral of linked and ongoing clinical encounters.

WHY IS CLINICAL REASONING IMPORTANT?

Nurses with effective clinical reasoning skills have a positive impact on patient outcomes. Conversely, those with poor clinical reasoning skills often fail to detect impending patient deterioration resulting in a "failure-to-rescue" (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). This is significant when viewed against the background of increasing numbers of adverse patient outcomes and escalating healthcare complaints (NSW Health, 2006). According to the NSW Health Incident Management in the NSW Public Health System 2007 (2008) the top three reasons for adverse patient outcomes are: failure to properly diagnose, failure to institute appropriate treatment, and inappropriate management of complications. Each of these is related to poor clinical reasoning skills. The Quality in Australian Healthcare Study (Wilson et al, 1995) found that "cognitive failure" was a factor in 57% of adverse clinical events and this involved a number of features including failure to synthesise and act on clinical information. Education must begin at the undergraduate level to promote recognition and management of the deteriorating patient, the use of escalation systems and effective communication (Bright, Walker, and Bion, 2004).

Contemporary learning and teaching approaches do not always facilitate the development of a requisite level of clinical reasoning skills. While universities are committed to the education of nurses who are adequately prepared to work in complex and challenging clinical environments, health services frequently complain that graduates are not 'work ready'. A recent report from NSW Health Patient Safety and Clinical Quality Programme (2006) described critical patient incidents that often involved poor clinical reasoning by graduate nurses. This report parallels the results of the Performance Based Development System, a tool employed to assess nurses' clinical reasoning, which showed that 70 per



cent of graduate nurses in the United States scored at an 'unsafe' level. Although these nurses had good content knowledge and adequate procedural skills, they frequently lacked the clinical reasoning skills needed to respond appropriately in critical situations (del Bueno, 2005). In Australia results are not dissimilar. The Australian Nursing and Midwifery Council (ANMC, 2005) Competency Standards for the Registered Nurse list "*critical thinking and analysis*" as one of its four key domains and nursing students are assessed against these standards. At the University of Newcastle results collated over a four year period (2004-2007) indicate that only a small number (< 15 per cent, $n = 162$) of 1086 third year nursing students demonstrated appropriate clinical reasoning and critical thinking skills during clinical competency assessment. The reasons for this are multidimensional but include the difficulties beginning nurses encounter when differentiating between a clinical problem that needs immediate attention and one that is less acute (del Bueno, 1994); and a tendency to make errors in time sensitive situations where there is a large amount of complex data to process (O'Neill, 1994).

In clinical practice experienced nurses engage in multiple clinical reasoning episodes for each patient in their care. An experienced nurse may enter a patient's room and immediately observe significant data, draw conclusions about the patient and initiate appropriate care. Because of their knowledge, skill, and experience the expert nurse may appear to perform these processes in a way that seems automatic or instinctive. However, clinical reasoning is a learnt skill (Higuchi & Donald, 2002; Kamin, O'Sullivan, Deterding & Younger, 2003). For nursing students to learn to manage complex clinical scenarios effectively, it is essential to understand the process and steps of clinical reasoning. Nursing students need to learn rules that determine how cues shape clinical decisions and the connections between cues and outcomes (Benner, 2001). Clinical reasoning is challenging and requires a different approach to that used when learning routine nursing procedures. Learning to reason effectively does not happen serendipitously. It requires determination and active engagement in deliberate practice for continued learning; it also requires reflection, particularly on activities designed to improve performance (Ericsson, Whyte and Ward, 2007).

'Thinking like a nurse' is a form of engaged moral reasoning. Educational practices must help students engage with patients with a deep concern for their well being. Clinical reasoning must arise from this engaged, concerned stance, always in relation to a particular patient and situation and informed by generalised knowledge and rational processes, but never as an objective, detached exercise (Tanner, 2006, p.209).

THE CLINICAL REASONING PROCESS

A diagram of the clinical reasoning framework is shown in *Figure 1*. In this diagram the cycle begins at 1200 hours and moves in a clockwise direction. The circle represents the ongoing and cyclical nature of clinical interventions and the importance of evaluation and reflection. There are eight main steps or phases in the clinical reasoning cycle. However, the distinctions between the phases are not clear cut. While clinical reasoning can be broken down into the steps of: *look, collect, process, decide, plan, act, evaluate* and *reflect*, in reality, the phases merge and the boundaries between them are often blurred. While each phase is presented as a separate and distinct element in this diagram, it is important to remember that clinical reasoning is a dynamic process and nurses often combine one or more phases or move back and forth between them before reaching a



decision, taking action and evaluating outcomes. It is also important that students learn to recognise, understand and work through each phase, rather than making assumptions about patient problems and initiating interventions that have not been adequately considered. In *Figure 2* the phases of the clinical reasoning process are described in more detail and in *Table 1* examples of the process are provided.

QUESTIONING ASSUMPTIONS

Preconceptions and assumptions such as “most indigenous people are alcoholics”; Middle Eastern women tend to have a low pain threshold”; and “elderly people often have dementia”, can influence the clinical reasoning process (Alfaro-LeFevre, 2009). McCarthy’s (2003) theory of situated clinical reasoning explains how nurses’ personal philosophies about aging influence how they manage older hospitalised patients experiencing symptoms of delirium. In McCarthy’s study nurses’ beliefs caused them to process clinical situations and act in particular ways. Their overarching philosophies served as perspectives that conditioned the ways in which they judged and ultimately dealt with older patients experiencing acute confusion. In another study by McCaffery, Rolling Ferrell and Paseo (2000) nurses’ opinions of their patients and their personal beliefs about pain significantly influenced the quality of their pain assessment and management. Thus, **in preparation for clinical reasoning** nursing students must be provided with opportunities to reflect on and question their assumptions and prejudices; as failure to do so may negatively impact their clinical reasoning ability and consequently patient outcomes.

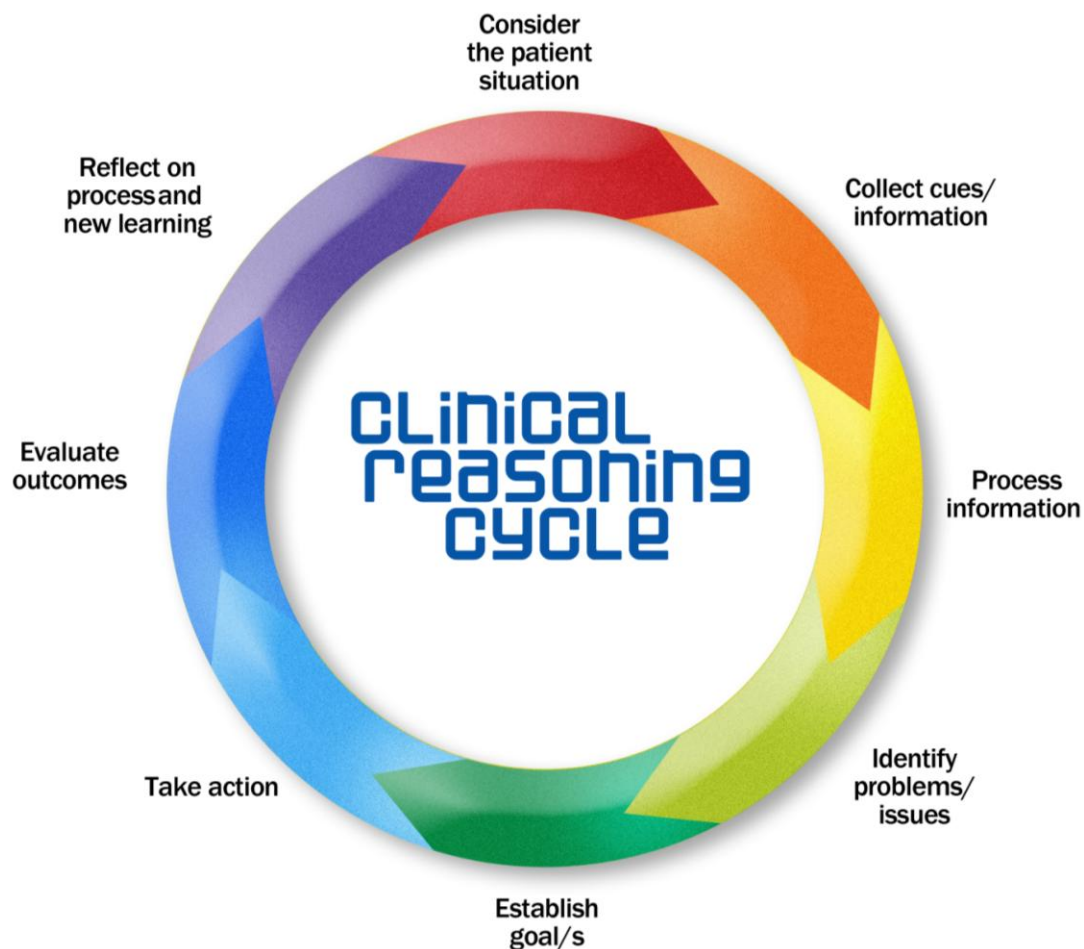


Figure 1: The clinical reasoning cycle

Figure 2: The clinical reasoning process with descriptors

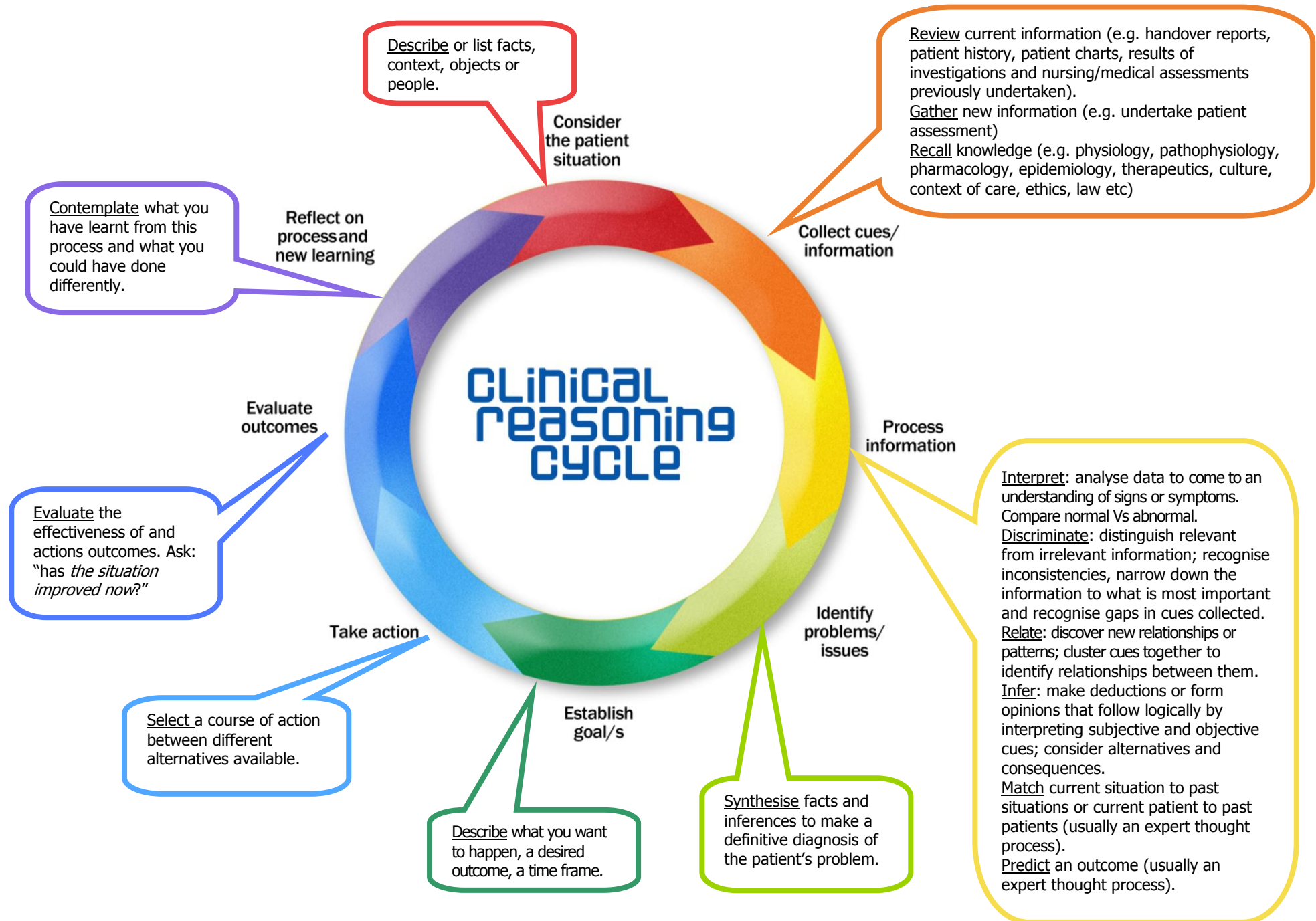


TABLE 1: THE PHASES OF THE CLINICAL REASONING PROCESS WITH EXAMPLES

Process	Description	Example
Consider the patient situation	<u>Describe</u> or list facts, context, objects or people.	This 60 year old patient is in ICU because he had an abdominal aortic aneurysm (AAA) surgery yesterday.
Collect cues/ information	<u>Review</u> current information (e.g. handover reports, patient history, patient charts, results of investigations and nursing/medical assessments previously undertaken)	He has a history of hypertension and he takes betablockers His BP was 140/80 an hour ago
	<u>Gather</u> new information (e.g. undertake patient assessment)	I've checked his BP and it is now 110/60, Temp 38 ⁴ . Epidural running @ 10ml/hr
	<u>Recall</u> knowledge (e.g. physiology, pathophysiology, pharmacology, epidemiology, therapeutics, culture, context of care, ethics, law etc)	BP is related to fluid status. Epidurals can drop the BP because they cause vasodilation. In ICU we have standing orders for epidural management.
Process information	<u>Interpret</u> : analyse data to come to an understanding of signs or symptoms. Compare normal Vs abnormal.	His BP is low, especially for a person who is normally hypertensive.
	<u>Discriminate</u> : distinguish relevant from irrelevant information; recognise inconsistencies, narrow down the information to what is most important and recognise gaps in cues collected.	His temp is up a bit but I'm not too worried about it – I'm more concerned about his BP and pulse. I'd better check his urine output and his O ₂ sats.
	<u>Relate</u> : discover new relationships or patterns; cluster cues together to identify relationships between them.	His hypotension, tachycardia and oliguria could be signs of impending shock. His BP went down after we increased the epidural.
	<u>Infer</u> : make deductions or form opinions that follow logically by interpreting subjective and objective cues; consider alternatives and consequences.	His BP could be low because of blood loss during surgery or because of the epidural.
	<u>Match</u> current situation to past situations or current patient to past patients (usually an expert thought process)	AAAs often have hypotension post op
	<u>Predict</u> an outcome (usually an expert thought process)	If I don't give him more fluids he could go into shock.

Identify problem / issue	<u>Synthesise</u> facts and inferences to make a definitive diagnosis of the patient's problem.	He is hypovolaemic and the epidural has worsened the BP by causing vasodilation.
Establish goals	<u>Describe</u> what you want to happen, a desired outcome, a time frame.	I want to improve his haemodynamic status – get his BP up and urine output back to normal over the next hour.
Take action	<u>Select</u> a course of action between different alternatives available	I will ring the doctor to get an order to increase his IV rate and to give aramine if needed.
Evaluate	<u>Evaluate</u> the effectiveness of outcomes and actions. Ask: "has <i>the situation improved now?</i> "	His BP is up for now but we will need to keep an eye on it as he may still need aramine a bit later. His urine output is averaging > 30mL/hr now.
Reflect on process and new learning	<u>Contemplate</u> what you have learnt from this process and what you could have done differently.	Next time I would ... I should have ... If I had ... I now understand ...

Adapted from Hoffman (2007); Alfaro-LeFevre (2009); Andersen (1991)

Responses from educators that can be used to encourage, facilitate and promote effective clinical reasoning:

Let's explore this.
Let's think this through.
Now let's consider all the possible options/solutions/outcomes.
Show me how you came to that decision
Walk me through your thinking about this.
That is one option; let's explore some others.
What are some possible outcomes of this approach?
That is a good thought/answer/response/idea ... let's expand on it.
Let's consider some alternatives
Let's figure this out.
Tell me about what you've learnt so far.
Great question!
Where would we find the answer to that?
Let's try that one again.
Why don't you lead us through that process?
It's not just about the right answer it's about learning the process
Good try ... have another go.
Now that you've worked that out let's try
OK. You are on the right track. Let's try something a little more challenging now.
Have you considered what could happen if ...
That is correct in this situation and for this person but what if ...
What do you think about
How do you know that to be true ... on what do you base your answer?

Adapted from Rubenfeld and Scheffer (2006, p. 82)

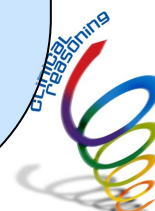


TABLE 2: Critical Thinking – ‘Habits of the Mind’

The clinical reasoning process is dependent upon a critical thinking ‘disposition’ (Scheffer & Rubenfeld, 2000). The table below lists the attributes needed for clinical thinking and clinical reasoning.

Habit	Description	Example
Confidence	Assurance of one’s reasoning abilities	My thinking was on track; I reconsidered and still thought I’d made the right decision; I knew my conclusion was well-founded.
Contextual perspective	Considerate of the whole situation, including relationships, background, situation and environment	I took in the whole picture; I was mindful of the situation; I considered other possibilities; I considered the circumstances.
Creativity	Intellectual inquisitiveness used to generate, discover or restructure ideas; the ability to imagine alternatives	I let my imagination go; I thought ‘outside of the box’; I tried to be visionary
Flexibility	Capacity to adapt, accommodate, modify or change thoughts, ideas and behaviours	I moved away from traditional thinking; I redefined the situation and started again; I questioned what I was thinking and tried a new approach; I adapted to the new situation.
Inquisitiveness	Eagerness to learn by seeking knowledge and understanding through observation and thoughtful questioning in order to explore possibilities and alternatives	I burned with curiosity; I needed to know more; My mind was racing with questions; I was so interested.
Intellectual integrity	Seeking the truth through sincere, honest processes, even if the results are contrary to ones assumptions or beliefs	Although it went against everything I believed I needed to get to the truth; I questioned my biases and assumptions; I examined my thinking; I was not satisfied with my original conclusion.
Intuition	Insightful patterns of knowing brought about by previous experience and pattern recognition	I had a hunch; While I couldn’t say why, I knew from last time this happened that ...
Open-mindedness	Receptiveness to divergent views and sensitivity to ones’ biases, preconceptions, assumptions and stereotypes	I tried not to judge; I tried to be open to new ideas; I tried to be objective; I listened to other perspectives.
Perseverance	Pursuit of learning and determination to overcome obstacles	I was determined to find out; I would not accept that for an answer; I was persistent.
Reflective	Contemplation of assumptions, thinking and action for the	I pondered my reactions, what I had done and thought;

	purpose of deeper understanding and self-evaluation.	I wondered what I could have/should have done differently; I considered what I would do differently next time; I considered how this would influence my future practice.
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(Adapted from Scheffer and Rubenfeld, 2000, p. 358; Rubenfeld and Scheffer, 2006, p. 16-24)



GLOSSARY OF TERMS

Term	Definition
Analyse	Separation into components: the breaking down of the whole into its parts (deductive reasoning).
Clinical reasoning	The process by which nurses (and other clinicians) collect cues, process the information, come to an understanding of a patient problem or situation, plan and implement interventions, evaluate outcomes, and reflect on and learn from the process.
Critical thinking	A complex collection of cognitive skills and affective habits of the mind
Cues	Identifiable physiological or psychosocial changes experienced by the patient, perceived through history or assessment and understood in relation to a specific body of knowledge and philosophical beliefs. Cues also include the context of care and the surrounding clinical situation.
Data	A piece or pieces of information about health status
Discriminate	To use good judgement ; to note or observe a difference accurately; to distinguish relevant from irrelevant information; to recognise inconsistencies; to narrow down the information to what is most important and recognise gaps in cues collected
Evaluate	To make a judgement about the worth or value of something
Facilitator	A person who guides the learning experience
Fidelity	Degree of realism
'Failure to rescue'	Mortality of patients who experience a hospital acquired complication
Goals	A desired outcome and a guidepost to the selection of nursing interventions
High fidelity Human patient simulation (HPS) manikins	Realistic with embedded software that can be remotely controlled by computer to allow for individualised, programmed scenarios, real-time interactions and cue response. They allow the operator to set physiological parameters and respond to students' interventions with changes in voice, heart rate, blood pressure and other physiological signs. Examples include Laerdal SimMan™ and METI™ manikins.
HPS	human patient simulation
Information and Communication Technology (ICT)	Any technology that has the capacity to accumulate, retrieve, control, convey or accept information by electronic means
Inconsistency	Something that contradicts something else or that is not in keeping with it; not regular or predictable
Infer	To make deductions or form opinions that follow logically by interpreting subjective and objective data; to consider alternatives and consequences
Interpret	Analyse data to come to an understanding ; to explain or tell the meaning of; present in understandable terms



Low fidelity HPS manikins	Simple task trainers such as IV arms and resuscitation torsos, and anatomically correct full body static manikins that replicate the external anatomy and joint movement of humans, but have no interactive capacity
Match	Information or cues that correspond to each other or cluster together naturally
Medium fidelity HPS manikins	Full body manikins that have embedded software that is controlled by an external, hand held device. They have the capacity to have set breath sounds, heart sounds, pulse and blood pressure, and are also capable of coughing, moaning or basic verbal communication. An example is Laerdal's Nursing Anne™ with VitalSim capability.
Outcome	A measurable change in a client's status in response to nursing care
PDA	Personal digital assistant (handheld computer)
Predict	To envisage or foresee something that may happen
Recall	To remember or recollect a past situation or piece of knowledge
Reflection	A critical review of practice with a view to refinement, improvement or change; the process of looking back and the careful consideration of an experience; to explore the understanding of what one did and why and the impact it has on themselves and others
Relate	To connect or link ; to discover new relationships or patterns; to cluster cues together to identify relationships between them.
'Rescue'	The ability to recognise deteriorating patients and to intervene appropriately
Simulation	An attempt to replicate, to varying degrees, a clinical situation, in order to teach or assess nursing skills and knowledge
Synthesis	The putting together of parts into the whole (inductive reasoning). The integration of new knowledge with previous knowledge, to form a 'new whole'

CLINICAL REASONING ERRORS

Error	Definition
Anchoring	The tendency to lock onto salient features in the patient's presentation too early in the clinical reasoning process, and failing to adjust this initial impression in the light of later information. Compounded by confirmation bias.
Ascertainment bias	When a nurse's thinking is shaped by prior assumptions and preconceptions, for example ageism, stigmatism and stereotyping
Confirmation bias	The tendency to look for confirming evidence to support a nursing diagnosis rather than look for disconfirming evidence to refute it, despite the later often being more persuasive and definitive.
Diagnostic momentum	Once labels are attached to patients they tend to become stickier and stickier. What started as a possibility gathers increasing momentum until it become definite and other possibilities are excluded.
Fundamental attribution error	The tendency to be judgemental and blame patients for their illnesses (dispositional causes) rather than examine the circumstances (situational factors) that may have been responsible. Psychiatric patients, those from minority groups and other marginalised groups tend to be at risk of this error.
Overconfidence bias	A tendency to believe we know more than we do. Overconfidence reflects a tendency to act on incomplete information, intuition or hunches. Too much faith is placed on opinion instead of carefully collected cues. This error may be augmented by anchoring.
Premature closure	The tendency to apply premature closure to the decision making process, accepting a diagnosis before it has been fully verified. This error accounts for a high proportion of missed diagnosis.
Psych-out error	Psychiatric patients are particularly vulnerable to clinical reasoning errors, especially fundamental attribution errors. Co-morbid conditions may be overlooked or minimised. A variant of this error occurs when medical conditions (such as hypoxia, delirium, electrolyte imbalance, head injuries etc.) as misdiagnosed as psychiatric conditions.
Unpacking principle	Failure to collect all the relevant cues in establishing a differential diagnosis may result in significant possibilities being missed. The more specific a description of an illness that is received, the more likely the event is judged to exist. If an inadequate patient history is taken unspecified possibilities may be discounted

Adapted from Croskerry, P. (2003). The importance of cognitive errors in diagnosis and strategies to minimize them. *Academic Medicine*. 78(8), 1-6.



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