

# HNE



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### Abstract

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. Errors in clinical judgement and decision making are said to account for more than half of adverse clinical events. For these reasons education must begin at the undergraduate level to develop students' critical thinking and clinical reasoning skills. Clinical reasoning is a learnt skill requiring determination and active engagement in deliberate practice as well as reflection, particularly on activities designed to improve performance. This paper profiles one of the learning approaches currently being used by the School of Nursing and Midwifery, at the University of Newcastle to enhance students' clinical reasoning ability and their preparedness for professional practice.

### INTRODUCTION

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 (Aiken et al 2003). This is significant when viewed against the background of increasing numbers of adverse patient outcomes and escalating healthcare complaints (NSW Health, 2006). The Quality in Australian Healthcare Study (Wilson et al, 1995) found that "cognitive failure" was a factor in 57% of adverse clinical events. Education must begin at the undergraduate level to develop critical thinking and clinical reasoning skills. This paper discusses the above issues and profiles one of the learning approaches currently being used by the School of Nursing and Midwifery, at the University of Newcastle to enhance students' clinical reasoning ability and their preparedness for professional practice.

### BACKGROUND

A 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. It is important to note that 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). 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); as well as 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 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) and requires a different approach to that used when learning more 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

In the literature the terms 'clinical reasoning', 'clinical judgment', 'problem solving', 'decision-making' and 'critical thinking' are often used interchangeably. At the University of Newcastle we refer to 'clinical reasoning' as 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, then reflect on and learn from the process (Levett-Jones et al, 2010). Clinical reasoning is not a linear process but can be conceptualised as a series or spiral of linked and ongoing clinical encounters (refer to Figure 1).

A diagram of the clinical reasoning framework used at The University of Newcastle is shown in Figure 1 (Page 14). 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. Although clinical reasoning can be broken down into the steps of: *look, collect, process, decide, plan, act, evaluate and reflect*; however 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.

### QUESTIONING ASSUMPTIONS

Clinical reasoning is dependent upon a critical thinking 'disposition' (Scheffer & Rubenfeld, 2000) and is influenced by a person's attitude, philosophical perspective and preconceptions (McCarthy, 2003). Preconceptions and inaccurate assumptions such as "most indigenous people are alcoholics"; "Young women

tend to have a low pain threshold”; and “elderly people often have dementia”, can negatively influence the clinical reasoning process (Alfaro-LeFevre, 2009). For example, McCarthy’s (2003) research into clinical reasoning investigated how nurses’ personal philosophies and stigma about ageing influenced how they managed hospitalised older people experiencing symptoms of delirium. Their overarching philosophies served as perspectives that conditioned the ways in which they assessed and managed older people 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 learning about 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.

## ENHANCING NURSING STUDENTS CLINICAL REASONING SKILLS

In recognition of the above factors a new assessment item was introduced in the Bachelor of Nursing Program at the University of Newcastle in 2010. With reference to the clinical reasoning errors outlined by Croskerry (2003) (refer to Table 1) third year students were required to reflect on an event from their clinical placement experience and engage in a metacognitive (thinking about one’s thinking) process. Students were instructed to:

1. Describe the event (its context and those involved);
2. Describe and discuss their reactions and responses as the event unfolded;
3. Discuss the clinical reasoning error/s and the personal, interpersonal, contextual, situational or political factors that affected their thinking;
4. Reflect upon the actual or potential impact of their clinical reasoning errors; and
5. Discuss changes they would make in future practice as a consequence of their learning.

In preparation for the assignment students were provided with a number of examples where clinical reasoning errors had been made by academic and clinical staff and that outlined the consequences of the error/errors for patients. These examples were a way of emphasising that by reflecting on and articulating one’s thinking we can each learn and improve our practice. The following section provides examples of students’ assignments and demonstrates their developing ability to ‘think like a nurse’.

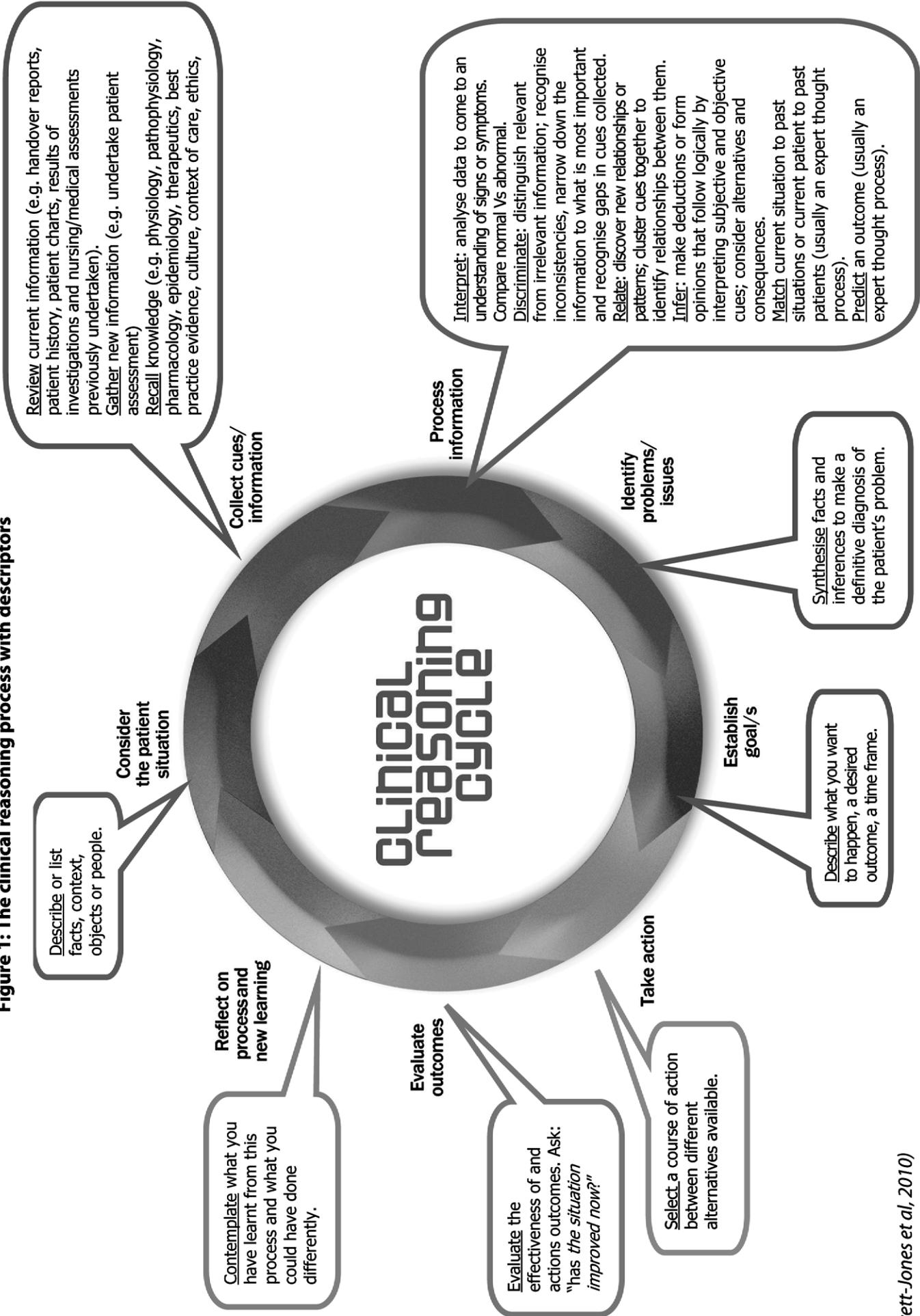
Error	Definition
Anchoring	<i>The tendency to lock onto salient features in the patient’s presentation too early in the clinical reasoning process, and failing to adjust this initial impression in the light of later information. Compounded by confirmation bias (see below).</i>
Ascertainment bias	<i>When a nurse’s thinking is shaped by prior assumptions and preconceptions, for example ageism, stigmatisation and stereotyping.</i>
Confirmation bias	<i>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.</i>
Diagnostic momentum	<i>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.</i>
Fundamental attribution error	<i>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.</i>
Overconfidence bias	<i>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.</i>
Premature closure	<i>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 nursing diagnosis.</i>
Psych-out error	<i>Psychiatric patients are particularly vulnerable to clinical reasoning errors, especially fundamental attribution errors. Co-morbid conditions may be overlooked or minimalised. A variant of this error occurs when medical conditions (such as hypoxia, delirium, electrolyte imbalance, head injuries etc.) are misdiagnosed as psychiatric conditions.</i>
Unpacking principle	<i>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.</i>

## ANCHORING AND CANNABIS-INDUCED HYPEREMESIS

Taylor (pseudonym) was a weepy young lady admitted with repeated vomiting. I assumed she had gastroenteritis and I felt sympathetic when I found her to be hypertensive. When she requested a shower I agreed, wanting her to feel comforted and fresh. A nurse then quietly explained that Taylor had presented before with cannabis-induced hyperemesis whilst denying the use of illicit drugs. Cannabis-induced hyperemesis is a syndrome associated with chronic cannabis use, and is characterised by cyclical vomiting and compulsive hot-water bathing (Darmani, 2010). Taylor was instructed not to shower, as she would linger there so that no-one could use the single bathroom on the ward.

I felt puzzled about the implied link between cannabis use, emesis and excessive showering. I also recognised that my assumption represented the thinking error of ‘anchoring’ – in which I

**Figure 1: The clinical reasoning process with descriptors**



(Levett-Jones et al, 2010)

prematurely attributed her vomiting to gastroenteritis based solely on her appearance as a well-presented young woman (Croskerry, 2003). I had not considered chronic drug use since it did not fit neatly into my mentally woven tapestry. Upon further reflection I realised the thought process that linked hypertension with anxiety had led me to disregard important pre-existing knowledge: that repeated vomiting is more likely to be associated with dehydration and subsequent hypotension. Through the window of my own sheltered naivety I had failed to pursue deeper answers – and hence I felt completely overwhelmed.

To circumvent such future thinking, I researched two weaknesses evident in this incident: lack of knowledge about cannabis-induced hyperemesis, and anchoring a diagnosis to a deceptive physical presentation. Importantly I discovered that intractable vomiting, combined with a compulsion for hot showers, is a clinical 'red flag' of long-term cannabis use (Allen, de Moore, Heddle & Twartz, 2004; Chang & Windish, 2009). In nursing practice I will take a thorough patient history, subsequently enabling prompt identification of these clients. This should result in reduced morbidity and the possible initiation of educative pathways in the dangers of substance abuse.

Groopman (2008) suggests that clinicians continually reflect on the question: 'Is there anything in this history, physical examination or laboratory results that does not fit my diagnosis?' This should reduce the temptation to discount information contradicting an initial hypothesis. I plan to utilise this strategy in every future patient encounter. Had I applied this to Taylor, I may have been alerted that her symptoms did not correspond with gastroenteritis – and that I must continue to probe until better answers came to light.

## PSYCH OUT ERROR AND NEUROLEPTIC MALIGNANT SYNDROME

Jill (pseudonym) a 44 year old woman previously diagnosed with schizophrenia was admitted to ICU in a catatonic state. Catatonia originated from the fight/flight response related to the "freezing" (scared stiff) (Moskowitz, 2004). It is not only linked to schizophrenia but is also associated with depression, anxiety, severe stress and can occur as an atypical reaction to antipsychotic medications. Catatonia and anxiety can occur simultaneously (Moskowitz, 2004). My mentor and I found that Jill was tachycardic, diaphoretic, tachypnoeic and febrile. These observations were only moderately outside normal limits and at the time I believed that they were most likely due to anxiety consistent with Jill's mental illness.

I admit that from the start I had made the clinical reasoning error described as *psych out* by seeing her as primarily mentally ill. This prevented me from looking at the whole picture (Klein, 2005). I had not considered the cause of her temperature as it did not fit into my original theory related to anxiety. I had made a thinking error by assuming that her previous admissions and psychological state was the most likely cause of her present physiological condition (Croskerry, 2003). I searched her file for supporting evidence but instead my attention was drawn to the fact that she had recently commenced the antipsychotic drug, clozapine.

The scenario ended unexpectedly when the doctors decided that Jill required specialist care and transferred her to a larger hospital. I continued to investigate by reviewing information in her file. I also searched for recent evidence based literature to discover the adverse effects of clozapine. I could then appreciate that her condition was far more serious than I had first thought, with a possibility of neuroleptic malignant syndrome (NMS). NMS

is a severe, potentially life threatening response to antipsychotic therapy. The most obvious symptoms include muscle rigidity, tachycardia, tachypnoea, diaphoresis and fever. Laboratory findings also show varying abnormalities (Strawn, Keck, & Caroff, 2007). Jill's symptoms were consistent with all of the described signs including her elevated temperature (Trollor, Chen, & Sachdev, 2009; Wren, Frizzell, Keltner, & Wright, 2003).

On analysing my thinking I see errors made were due to my over-enthusiasm to know and understand. I recognize that my ideas are affected when I have only partial knowledge of a situation as I like to fix things quickly and am uncomfortable with not knowing what is wrong. My clinical errors in this scenario are interconnected and led to several biased judgements. In order to counteract this type of thinking in future I will review clinical pathways and care plans available as tools in guiding me to collect information methodically and enhance my practice (Bradley, 2005). I will also always investigate other information such as blood results. Had I done so here, I would have been alerted to the rise in creatine kinase (CK) which often accompanies NMS (Trollor et al., 2009). With awareness of my cognitive processes I will be less likely to jump to conclusions and I'll remember that too often "when the diagnosis is made the thinking stops" (cited in Croskerry, 2003, p. 778).

## DIAGNOSTIC MOMENTUM AND CONFIRMATION BIAS

At handover on the second week of my placement in an emergency department I learnt that one patient I was to assist in caring for was a boy of 16 who had queried hepatitis A. Another patient, a man of 55, had a queried deep vein thrombosis. It was at this point my clinical reasoning errors began. *Diagnostic momentum* (Croskerry, 2003) took over and I found myself treating these patients as if their diagnosis had been confirmed. This was compounded by *confirmation bias* (Croskerry, 2003) when the boy indicated his abdominal pain was located at the site of his liver. Confirmation bias also occurred when the older man stated he had collapsed without warning three days previously. I took this to have been caused by a clot coming away and forming an embolism, temporarily blocking blood supply to his brain. As it turned out the boy had gastroenteritis and the older man's calf pain was muscle related; his collapse was attributed to an episode of hypoglycaemia, as he was diabetic.

The one strength I take out of this episode is my capacity to review current information, gather cues and recall knowledge to form a nursing diagnosis, even though in this case it was erroneous. Of course my weakness is to act before all information and cues are gathered.

My thinking in this episode was affected by my desire to sound "clever" and knowledgeable to my mentor and other nurses in trying to establish a little bit of "credibility". I have come to realise now that the only way to have "credibility" is to be more critical in my thinking.

My strategies for addressing the weaknesses exhibited in this episode are to continue to gather cues, use current information and the recall knowledge prior to forming a nursing diagnosis. The difference in future will be not to use the information merely to confirm what I think is happening but to gain a more accurate picture of the patient's situation.

## ANCHORING, PREMATURE CLOSURE, ASCERTAINMENT BIAS AND SEPSIS

During my placement in the emergency department I was involved in the care of Jack (pseudonym) a 71 year old morbidly obese man who presented with a fever and urinary problems. Jack was triaged as a category 3 at this time and therefore was put into a non-monitored bed. Upon my first visual observations I remember feeling disgusted at Jack's weight and I noted that he was extremely short of breath, sweaty, smelly and soaking wet from urine.

Oxygen was commenced and I took Jack's initial vital signs. What stood out to me the most was his temperature of 38.1°C, his blood pressure of 157/63 and his irregular heart rate of 105 BPM. I was sure this was something to do with his heart, maybe a myocardial infarct as this man was the perfect candidate for a heart attack with his pre existing health conditions. I was to learn that this approach was an example of *anchoring, premature closure and ascertainment bias* (Croskerry, 2003).

It was still a while to go until this man could be seen by the doctor so I decided to do an ECG. I asked another nurse to help as there was no way I could roll this man and get his polo shirt up far enough by myself. We tried to roll him but the two of us were not enough. There were no other nurses free at this time so I decided to just monitor Jack closely. Forty minutes went by and I was getting quite worried at this time as I had attended another set of observations and found Jack's blood pressure to have dropped to 110/52; his heart rate was elevated 128 BPM and he was febrile with a temperature of 38.9°C. I notified my mentor and Jack was immediately transferred to a monitored bed and prioritised to see the doctor. I asked my mentor what was happening and whether Jack was having a myocardial infarction. She said they were querying sepsis. Sepsis is a life threatening systemic infection of the bloodstream characterised by a inflammatory response syndrome (non-infective) or an infective process caused by bacterial, viral or fungal invasion that induces an inflammatory response (Steen, 2009). Sepsis is associated with an increasingly high mortality rate. It is claimed that more people die from sepsis than from lung, bowel or breast cancer (Steen, 2009, p. 49). Sepsis can quickly cascade in to six stages. The first stage is the source of the infection inducing an inflammatory response, second stage is severe sepsis which occurs when there is induced organ dysfunction resulting in tissue hypoxia from hypoperfusion, third stage is septic shock which remains the consequence of unresolved organ failure, fourth stage is total organ dysfunction, fifth stage multiple organ failure and finally death (Steen, 2009, p. 49).

I had been too busy focusing on Jack's physical appearance to notice the severity of his symptoms and I had missed such an important thing like sepsis. Even though my mentor commended me for picking up his abnormal vital signs and reporting them I felt rather guilty as it was only a couple of days earlier that I had learned that a drop in blood pressure, tachycardia and increased temperature can be signs of sepsis.

I believe that when looking after a patient again with such symptoms, I will look at the whole picture, complete a head to toe assessment, gaining better overall evidence instead of just focusing on my initial assumptions. I will definitely learn from this clinical error and review the topic of sepsis by researching current literature.

## FUNDAMENTAL ATTRIBUTION ERROR, OVERCONFIDENCE BIAS AND UNPACKING PRINCIPLE

A 52 year old male, John (pseudonym), was brought into the emergency department by the police and the local mental health team. John was in breach of his community treatment order. On presentation John had slurred speech, was unable to stand or walk unassisted and was very aggressive. A code black was called after the triage nurse was punched and the attending nurse was bitten whilst obtaining a blood pressure. The emergency medical officer and two security personal responded, with John being restrained and sedation administered.

I had been asked to obtain a patient history. However, upon presentation I had already labelled John as an alcoholic who was homeless and suffering from some sort of mental illness. I didn't see the purpose of taking a full patient history and thought that we just needed to sober him up and then release him back to the mental health team. The clinical reasoning errors that influenced my attitude and thinking included *fundamental attribution error* - I believed the patient's illness and situation were self inflicted due to his decision to drink; *overconfidence bias* and *unpacking principle* - I did not believe this patient had any real medical issues due to my labelling him as an alcoholic. Due to my assumptions I did not collect a thorough history or assessment of this patient and disregarded the real medical and social problems that he was presenting with.

John was homeless and had been for the past 6 years, since his wife, daughter and two grandchildren had been killed in a car accident; he was simply unable to function anymore. Three years ago John had come to the attention of the mental health team and he was diagnosed with an anxiety disorder, delusions, paranoia and panic attacks; he was also misusing alcohol and drugs; however he had been clean and sober for past 18 months.

It was later established that John had a blood alcohol reading of zero. He was diagnosed with severe dehydration and a mild cerebrovascular haemorrhage.

I was fortunate to have been supervised throughout this experience so my personal judgements did not endanger this patient. However, this has been an invaluable experience for me as I have learnt that you need to treat every patient individually without judgement and a thorough history is essential to understand what may be impacting on the patient's health status. I will endeavour to remember this in the future and not allow my biases to cloud my thinking.

## CONCLUSION

Competent professional practice requires not only psychomotor and affective skills but also sophisticated thinking abilities. Nurses are responsible for a significant proportion of the judgments and decisions made in healthcare (Thompson et al, 2004). Even new graduate nurses are required to make increasingly complex decisions about patients with diverse health needs (Lasater, 2007). Effective clinical reasoning skills are a key factor in the prevention of iatrogenic harm. When cognitive errors occur nurses' clinical decisions may be inaccurate and associated with inappropriate interventions that can lead to increased and untimely patient mortality. This paper has profiled one of the learning approaches currently being used by the School of Nursing and Midwifery, at the University of Newcastle to enhance students' clinical reasoning ability and their preparedness for professional practice.

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