

Interprofessional learning through simulation

Importance of clinical reasoning: *a case study*



**THIS CLINICAL TRAINING INITIATIVE IS SUPPORTED BY FUNDING FROM
THE AUSTRALIAN GOVERNMENT UNDER THE INCREASED CLINICAL
TRAINING CAPACITY (ICTC) PROGRAM**

Table of Contents

Acknowledgements	2
Foreword	2
Interprofessional Ambulatory Care Program	3
ECU Health Simulation Centre	4
Interprofessional learning	4
Interprofessional learning through simulation	5
How to use this resource package	6
Scenario brief	8
Key learning competencies	8
Interprofessional communication	8
Client centred care	9
Reflective practice	9
Key discussion points	9
Segment 1: Physiotherapy.....	9
Segment 2: Medical Emergency Team (MET)	10
Segment 3: Resolution	10
Segment 4: Debrief.....	11
Literature review	13
Clinical reasoning in clinical practice	13
Teaching clinical reasoning	14
Clinical reasoning process.....	14
The Clinical Reasoning Cycle.....	15
The Clinical Reasoning Cycle for Russell Stanton.....	16
Decision-making framework	18
Conclusion	19
Medical glossary and acronyms	20
Further information	23
References	24

Acknowledgements

This resource was developed by the Interprofessional Ambulatory Care Program (IpAC) at Edith Cowan University (ECU) in collaboration with the ECU Health Simulation Centre with funding provided by the Australian Government under the Increased Clinical Training Capacity (ICTC) Program.

Foreword

Professor Cobie J. Rudd

*Pro-Vice-Chancellor (Health Advancement), and National Teaching Fellow 2011-12,
Australian Government Office for Learning and Teaching
ECU*

Australia's health workforce is facing unprecedented challenges. Supply won't meet demand, and the safety and quality of care remain key issues. The national health workforce agency, Health Workforce Australia (HWA), an initiative of the Council of Australian Governments (COAG), has been established to address the challenges of providing a workforce that meets the needs of our community – now and in the future.

Accordingly, ECU has set a priority on meeting these challenges, with a focus on the national health workforce reform agenda set out in the 2008 National Partnership Agreement (NPA) on Hospital and Health Workforce Reform.

In June 2010, ECU was awarded \$4.6M from the Australian Government through a nationally competitive process under the ICTC Program, an initiative which aims to develop interprofessional learning and practice capabilities in the Australian health workforce.

The IpAC Program aims to complement traditional clinical placement activities with high quality interprofessional learning competency development and assessment, so that at the earliest point students gain exposure to best work practices within multidisciplinary teams that have the patient's individual needs as the focus.

Additionally, the IpAC Program has developed interprofessional learning resources and interprofessional health simulation challenges in collaboration with the ECU Health Simulation Centre. The ECU Health Simulation Centre is recognised internationally as a

specialist centre in providing human factors based sequential simulation programs using professional actors. Most simulated learning interactions revolve around a single moment, such as a patient's admission to the emergency department. What we provide at the ECU Health Simulation Centre is a sequential simulated learning event that follows the patient and carer's journey through the healthcare system, for example, from the accident site following a motor vehicle accident, to the emergency department, to a hospital ward, to their home and into the community for GP and allied health follow-up.

Human factors in health care are the non-technical factors that impact on patient care, including communication, teamwork and leadership. Awareness of and attention to the negative aspects of clinical human factors improves patient care.

ECU's involvement in national health workforce reform is all about playing a role that enables the health workforce to better respond to the evolving care needs of the Australian community in accordance with the NPA's agenda. The IpAC Program is an example of how we can work across sectors, nationally and internationally, to determine better ways of addressing the pressing issue of how best to prepare students for the workplace and thus assuring that health systems have safe, high quality health services.

Interprofessional Ambulatory Care Program

ECU's IpAC Program was established with support from the Australian Federal Government through funding from the ICTC Program. The IpAC Program aims to deliver a world-class interprofessional learning environment and community clinic that develops collaborative practice among health professionals and optimises chronic disease self-management for clients.

This is achieved through the provision of clinical placements within the multidisciplinary team at the IpAC Unit, a community clinic that develops communication and collaboration among health professionals and optimises chronic disease self-management for clients.

Additionally, a range of clinical placements are offered at existing health facilities, where trained IpAC Program clinical supervisors provide clinical support and ensure the integration of interprofessional learning into each clinical placement.

The IpAC Unit, in collaboration with the ECU Health Simulation Centre, has developed a range of interprofessional learning through simulation resources. These learning resources are packages consisting of an audiovisual resource and a facilitator's manual, and aim to facilitate interprofessional learning and to support the participants in the development of interprofessional skills.

The interprofessional learning through simulation resources developed by the IpAC Program aim to provide health students and health professionals with the opportunity to learn with, from and about one another by engaging them in interactive live simulation events. These simulations encourage students and professionals to challenge themselves and each other in a safe learning environment.

ECU Health Simulation Centre

ECU houses the only fully functioning Health Simulation Centre of its kind in Western Australia, specifically designed and equipped to address the interprofessional learning needs of the health workforce and implementation of both state and national safety and quality frameworks.

The ECU Health Simulation Centre offers health workforce training and development specialising in clinical skills, human factors, and patient safety training for multidisciplinary health teams. Using a variety of educational techniques, including a broad range of simulation mannequins, professional actors and task trainers, ECU specialises in immersive simulation and observational learning. Supporting the ECU Health Simulation Centre are nursing, medical, paramedic and psychology academic and technical staff whose aim is to cultivate the development of competent and confident health professionals centred on enhancing patient safety.

Interprofessional learning

Interprofessional education occurs when two or more professions learn with, from and about each other in order to improve collaboration and quality of care (Centre for the Advancement of Interprofessional Education, 2002).

Interprofessional learning is the learning arising from interaction between students or members of two or more professions. This may be a product of interprofessional education or happen spontaneously in the workplace or in education settings (Freeth, Hammick, Reeves, Barr, & Koppel, 2005). It has been found that interprofessional education can improve collaborative practice, enhance delivery of services and have a positive impact on patient care (Canadian Interprofessional Health Collaborative (CIHC), 2008).

The World Health Organization (WHO) has recognised the importance of interprofessional education and collaborative practice in developing a health workforce that is able to meet the complex health challenges facing the world and assist in the achievement of the health-related Millennium Development Goals (World Health Organization, 2010). In developing its framework for action, the WHO have recognised that models of interprofessional collaboration are most effective when they consider the regional issues and priority areas (including areas of unmet need) in the local population (World Health Organization, 2010). In doing so, interprofessional education and collaborative practice can best maximise local health resources, reduce service duplication, advance coordinated and integrated patient care, ensure patient safety and increase health professional's job satisfaction (World Health Organization, 2010).

The end goal of interprofessional education is to create a health workforce with improved levels of teamwork, collaboration, knowledge-sharing and problem-solving, eventually leading to better patient and client outcomes in health settings (Braithwaite et al., 2007).

Interprofessional learning through simulation

Simulation in education refers to the re-creation of an event that is as closely linked to reality as possible. Gaba (2004) defined simulation as a technique, rather than a technology, to replace or amplify real life experiences with guided experiences often immersive in nature to evoke or replicate aspects of the real world, in a fully interactive pattern. Simulation provides a safe learning environment for students to practice, where they are free to make mistakes, correct them and improve the processes of care (Kenaszchuk, MacMillan, van Soeren, & Reeves, 2011). Simulation is the bridge between classroom learning and the real life clinical experience, allowing students to put theory into practice.

Interprofessional learning through simulation combines the principles of interprofessional learning and the use of simulation as an educational methodology. Interprofessional learning through simulation provides students with the opportunity to practice working with other health professionals and allows participants to explore collaborative ways of improving communication aspects of clinical care (Kenaszchuk, et al., 2011).

Many of the interdisciplinary team core competencies, such as problem solving, respect, communication, shared knowledge and skills, patient-centred practice, and the ability to work collaboratively (Canadian Interprofessional Health Collaborative, 2010) can all be developed by interprofessional learning through simulation.

Teamwork and interprofessional practice and learning are being recognised as central to improving client care and outcomes and enhancing client safety (Sargent, 2008). Promoting patient safety through team efforts is one of the five core competencies identified by the Institute of Medicine (2003).

In today's healthcare setting, no one health professional can meet all of the client's needs and therefore a healthcare team approach is required. Interprofessional learning through simulation provides learning opportunities to prepare future healthcare professionals for the collaborative models of healthcare being developed internationally (Baker et al., 2008).

How to use this resource package

This interprofessional learning through simulation resource package has been designed to support the facilitation of interprofessional learning among students and practitioners with an interest in developing their skills and knowledge of interprofessional practice.

The package consists of two components: an audiovisual resource and a supporting manual. In order to optimise the learning opportunities from this package it is recommended that participants are firstly introduced to the concepts of interprofessional learning and human factors in health care.

The package has been created in a format to enable flexibility in its application depending on the educational setting. We recommend the following format:

1. Facilitator guided discussion around the concepts of interprofessional learning and human factors in health care.
2. View audiovisual resource in its entirety.
3. View segments of the audiovisual resource.
4. The viewing of each segment is followed by a facilitator guided discussion around the scenario specific learning competency areas (samples for each discussion are given within the manual).
5. After the last segment: facilitator guided discussion, identifying and discussing the changes witnessed and how this impacted on the alternative outcome. In particular discussion relating these changes to personal (future) practice is essential in improving interprofessional practice.

Opportunities for further reading and exploration of the scenario are provided in the *Further Information* and *References* sections of this resource manual.

Scenario brief

Russell Stanton, a 25 year old man, sustained a cervical 6 spinal injury during a game of rugby. He is in a tilt 'n' space wheelchair, has six-hourly catheters and attends regular physiotherapy sessions. He generally maintains his fluid restriction.

Whilst attending one of his physiotherapy sessions he develops Autonomic Dysreflexia. This is his first episode and he is very frightened. A Medical Emergency Team (MET) call is made by the Physiotherapist, calling in a Doctor, a senior Nurse and a student Nurse. The MET must determine the cause of his Autonomic Dysreflexia before his symptoms escalate. This scenario uses the clinical reasoning cycle to demonstrate interprofessional practice.

List of characters

- Doctor
- Nurse
- Nursing student
- Patient
- Physiotherapist
- Physiotherapy student

Key learning competencies

The key learning competencies for this scenario are based on the IpAC Program learning objectives as well as the Canadian Interprofessional Health Collaborative (CIHC) Competency Framework (Canadian Interprofessional Health Collaborative, 2010). The specific competency areas for this scenario are:

- Interprofessional communication
- Client centred care
- Reflective practice

Interprofessional communication

The interaction between professionals demonstrates:

- Communication that is consistently authentic and demonstrates trust.
- Active listening to team members (including the client/family).
- Communication that ensures a common understanding of care decisions.

- The development of trusting relationships with clients/families and other team members.

Client centred care

The interaction between team members and the client demonstrates:

- The sharing of information with clients in a respectful manner.
- Communicating with clients in a way that is clear, understandable and free of jargon.
- Listening respectfully to the needs of all parties to ensure the most appropriate care.
- The interaction is supportive to the client.

Reflective practice

Reflective practice is crucial in continuous development and re-assessment of skills when working in health care. A reflective practitioner:

- Reflects on feedback and integrates changes into practice.
- Reflects on how perceptions, attitudes and beliefs impact on practice.
- Identifies knowledge deficits and seeks clarification.

Key discussion points

Segment 1: Physiotherapy

What is happening to the patient? Why is the physiotherapist concerned?

- A.** This may be autonomic dysreflexia, a medical emergency, as it may result in seizures and even death.

Is the blood pressure (BP) a concern?

- A.** This patient has a BP of 140/90. In the average population a BP of below 130/80 is optimum, anything over 140/90 can be considered abnormal. The normal BP for a person with a quadriplegic injury falls within the range of 80/40 to 100/60, and a BP of 140/90 is very high (Claydon & Krassioukov, 2006).

What is a MET call and who can call it? Why is the physiotherapist placing a MET call?

- A.** MET is a Medical Emergency Team, comprised of staff who possess expertise in the management of an acutely unwell patient. The MET aims to prevent serious adverse events in hospital, but also enables education and sharing of critical care skills with ward staff and the ability to advise on patient management and follow up (Jevon, 2010).

A. Autonomic Dysreflexia is a medical emergency because of the possible impact on the patient's health.

How is the patient feeling? What can the health professionals do to reduce his fear?

A. The physiotherapist is talking very calmly and knows what to do in this situation so this will have a calming effect on the patient.

A. The student is letting the more experienced physiotherapist take the lead.

A. Telling the patient what the possible problem is may or may not alleviate his stress.

What did the physiotherapist and the student do well, and what could they have done better?

Did the physiotherapist use the clinical reasoning cycle? (see page 15 of this manual)

Segment 2: Medical Emergency Team (MET)

How would you describe the communication within the team?

If you were the student nurse, how would you feel when called out on the MET call? Is this student supported by the other members of the team? Is she an active team member?

A. The Registered Nurse checks the knowledge of the student nurse which could be seen as supportive or undermining.

Who is the team leader? Why is this person the team leader?

A. This question could generate a discussion about the role of the Registered Nurse and the Doctor as both show leadership characteristics.

How do the team members ensure each team member has the same information?

Who summarises the patient file? Do they have all the relevant information?

A. The Doctor summarises the information and checks this with the other team members to ensure everyone has the same information.

Does the team use the clinical reasoning cycle? (see page 15 of this manual)

Segment 3: Resolution

Give examples of how the team is working well together and how they could improve their work together.

A. Discuss each team member: Doctor, Nurse, Nursing student, Physiotherapist, Physiotherapy student.

Is the patient part of the team?

A. The team members ask each other questions about his bowel movement and other physical tests but they do not ask the patient himself.

A. The student nurse asks the nurse whether she can sit in but could have asked the patient.

What would be the reasons for the team members to ignore the patient's remarks?

A. His discomfort and fear could influence their decision making in a negative way.

A. He feels a headache but in Autonomic Dysreflexia the issue is likely to be located elsewhere.

A. His response could not be the truth, either because he does not know or because he finds it difficult to maintain fluid restriction.

How is the team using the clinical reasoning cycle to identify and address the patient's emergency health concern?

A. The clinical reasoning cycle has been described in further detail in pages 16 to 18 of this manual.

Who is the team leader in this segment? Why this person?

A. Leadership is shared between the Doctor and Nurse. The Doctor hands over to the Nurse as soon as the situation is no longer an emergency.

A. The Physiotherapist steps back to let the MET take control of the situation.

Describe the good aspects of the debrief and provide suggestions for improvement for the Physiotherapy student by the Physiotherapist.

A. She offers to give him information to recognise Autonomic Dysreflexia in future.

A. She lets him know that she is aware he was not trained to recognise this prior to this happening.

A. She shares that she also could have done better.

A. The Physiotherapist lets the student write up the report, with her support, so he can practice this himself.

A. She does not highlight the things he did well.

A. She tells him he is accountable, though in the current situation, she is accountable as well as the student is still in training.

Segment 4: Debrief

Who has the responsibility to recognise the symptoms? Does the patient have responsibility?

A. This question could generate a discussion around self-care; self-management; caring for patients; and patients' responsibility for their own health and wellbeing.

Describe the good aspects as well as suggestions for improvement for the debrief of this patient.

How do you think the patient felt in each segment of this scenario? Could you describe what caused the patient to feel like this?

A. Even though the patient had been informed about Autonomic Dysreflexia experiencing the sudden rise in blood pressure with the knowledge this may be life threatening was a stressful situation for the patient.

A. The patient will feel more informed after this event and will more easily recognise the symptoms so that he can advise his carers about this medical emergency.

Do the health professionals and students feel more or less confident after this event? Why?

What has this scenario highlighted for your personal (future) practice?

What aspects of interprofessional learning objectives were highlighted most strongly for you:

- Interprofessional communication;
- Client centred care; or
- Reflective practice.

What changes will you make in your personal (future) practice to improve interprofessional practice?

Literature review

Ebright et al (2003, p. 631) states that health care professionals '*need to manage complexity in the midst of a changing environment*'. The failure to ensure adequate thought and clinical reasoning can have a negative impact on a patient's condition (Aitken, 2003). According to Levett-Jones et al (2010, p. 515) clinical reasoning is the method in which health care professionals '*collect cues, process the information, come to an understanding of a patients' problem or situation, plan and implement interventions, evaluate outcomes and reflect on and learn from the process*'. In basic terms, clinical reasoning is a term which describes the process used by health professionals to make informed decisions about and solve problems arising in patient care.

Clinical reasoning in clinical practice

Health care professionals need to be flexible in their approach to decision-making and ensure continuity of care. The health care professional's ability to provide safe, high quality health care can be dependent on their ability to reason, think and judge, which can be limited by lack of experience (Benner, Hughes, & Sutphen, 2008). Simmons (2010, p. 1155) states that '*clinical reasoning is a complex cognitive process that uses formal and informal thinking strategies to gather and analyse patient information*'. This process is reliant on the health care professional using both their intuition and knowledge to influence decision-making for individual client circumstances. The experience and knowledge of the health care professional is an important consideration in the consolidation of clinical reasoning.

Simmons (2010) considers this by suggesting that newly qualified nurses, for example, may identify fewer cues, have difficulty identifying complex diagnosis and may not re-evaluate data as often as experienced nurses. This has the potential to have a negative impact on patient care. Hamm (1991, cited in Round, 2001) agrees that the clinical situation and the practitioner's knowledge and clinical experience could impact on the clinical reasoning employed and its efficiency. However, an individual's extensive experience could be irrelevant if faced with a situation that they have not previously been exposed to. Thompson and McCaughan (2002) conclude that a good clinical decision is one that takes into account the current best practices, considers patient preferences and is undertaken by experienced health professionals.

Teaching clinical reasoning

Teaching clinical reasoning can be difficult to facilitate in an educational setting due to the lack of clinical context. Many of the traditional styles of teaching introduce decision-making processes as a method of 'pattern recognition'. This relies on the health care professional to draw upon past experiences to re-examine them in light of the 'new' clinical scenario (Boyd, 2011, p. 574). The concern with utilising some traditional decision-making processes is the use of 'checklists' to formulate clinical reasoning and decision-making and by doing so fail to apply critical analyses to evaluate outcomes (Boyd, 2011). The use of Simulated Learning Environments (SLE) has been increasingly adopted to address this criticism and to support the clinical teaching of necessary skills required for safe and competent practice. SLE enables health care professionals to be exposed to clinical reasoning strategies and encourages them to explore the predisposing factors and draw upon interprofessional experience to enhance the decision-making process. This is all carried out in a protected environment so that all issues can be openly explored without the time pressures that health professionals face in the clinical setting. In a position statement from the Australian Medical Association (2011), the writers suggest that SLE allow clinical teams to learn and practice together, leading to a reduction of anxiety and enhanced assurances for the management of effective patient care.

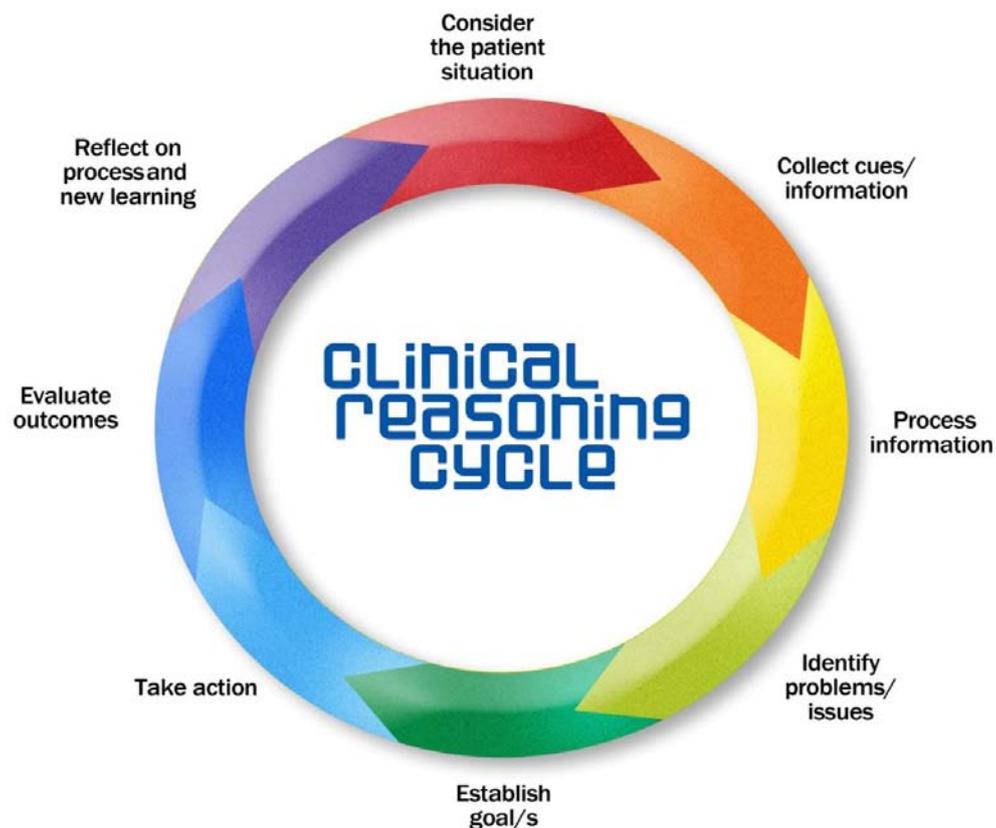
Clinical reasoning process

In clinical practice, many medical decisions are complex and are dependent on countless internal and external factors. Therefore it is useful for health care professionals to follow a formal decision-making tool. Commonly used tools include the '*Decision Tree*' (Round, 2001, p. 110) and the '*Clinical Reasoning Cycle*' (Levett-Jones, et al., 2010) These tools allow the health care professional to make choices through a systematic process which considers many clinical predisposing and contributing factors. Simmons (2010) relates clinical reasoning tools as following a forward chaining process that moves sequentially through a series of logical considerations to end at a final decision.

According to Jones (1988), when working through the processes of clinical reasoning the health care professional will identify a specific health problem/care need and the adoption of a clinical reasoning cycle facilitates the 'thinking' behind the clinical management plan. This has been referred by Jones (1988) as 'goal driven' patient care.

The Clinical Reasoning Cycle

The Clinical Reasoning Cycle requires health care professional to examine and discuss the steps in a clockwise direction to facilitate decision-making, enabling the clear formulation of a care plan (Levett-Jones, et al., 2010). This cycle has been applied in the current scenario involving patient Russell Stanton. The thought processes of the care team who was caring for Russell will be explored through application of the Clinical Reasoning Cycle to demonstrate how this decision-making process is used in practice.



Source: (University of Newcastle, 2009)

The Clinical Reasoning Cycle for Russell Stanton

Step 1: Consider the patient situation

Russell Stanton is a 25-year-old male who is being treated for C6 Tetraplegia as a result of a rugby accident six weeks prior.

Step 2: Collect cues and information

Review the client's current medical history and gather specific information on the present activity/treatment.

Russell was undergoing passive arm mobilisation treatment with a Physiotherapy student when he suddenly felt unwell.

Step 3: Process information

Recognise the changes in the patient's condition. In doing so, try and distinguish between the changes that need immediate intervention and changes that should be considered for future care. Look to see whether there are any relationships between the changes, particularly relating it to past experiences. Predict a possible expected outcome.

There is a sudden change or deterioration in Russell's condition. He is complaining of:

- Headache
- Blocked nose
- 'Sweating' and feeling flushed

The Physiotherapist suggests it could be Autonomic Dysreflexia.

Step 4: Identify problems and issues

Examine the facts to establish a definitive diagnosis.

The Physiotherapist is aware of the potential severity of this situation and asks the Physiotherapy student to sit Russell up to 90 degrees and take his blood pressure, which would be elevated if Russell has Autonomic Dysreflexia as suspected. The blood pressure is hypertensive at 140/90.

The Physiotherapist puts out a call to the Medical Emergency Team (MET).

Step 5: Establish the goal/s

Make a plan of care with specific outcomes which relate to a realistic time frame.

Following the arrival of the MET, the leading Doctor confirms that the most likely cause of the sudden deterioration is Autonomic Dysreflexia.

If the blood pressure remains elevated this could lead to intracranial haemorrhage, seizures or cardiac arrhythmia.

The goal initiated by the Doctor is to find out what is causing the Autonomic Dysreflexia.

Plan:

1. Continue regular blood pressure monitoring;
2. abdominal assessment including bladder and bowel;
3. skin integrity assessment; and
4. identification of any other contributing environmental factors.

Step 6: Take action

Carry out the plan of care.

Assessment of Russell includes:

- Repeat blood pressure - hypertensive at 170/130. Doctors administer GTN spray.
- Assessment of abdominals - indicates no signs of distension. Bladder scan shows only 100mls of urine.
- Assessment of bowels - bowels opened today.
- Assessment of skin integrity - antiembolic stocking is 'bunched up over the right foot'.
- Other factors – the antiembolic stocking is identified as cutting off the blood supply which has caused the Autonomic Dysreflexia. The stocking is removed.

Step 7: Evaluate outcome

Review the patient's condition to see whether they have improved.

Upon removal of the stocking:

- Right foot - colour returning to his foot.
- Blood pressure - returning to normal.

There is no need for further assessment of other contributing environmental factors.

The stocking was the cause of the Autonomic Dysreflexia.

Step 8: Reflection

Consider the treatment given and establish what you have learnt, what went well and what could be improved.

1. The student Physiotherapist should have paid more attention to Russell's concerns and called for assistance sooner, as he himself was unsure of the cause of Russell's deterioration.
2. The student Physiotherapist has learnt a valuable lesson in specific complications that can occur in spinal injury patients.
3. The Physiotherapist acted promptly by recognising the early signs of Autonomic Dysreflexia.
4. The MET were quick to establish the cause of the problem before Russell's condition became too compromised.
5. The Physiotherapist allocated time to provide the Physiotherapy student with the opportunity to debrief on the client's sudden deterioration and highlight any further training needs.

The clinical reasoning cycle has facilitated a positive outcome for Russell. The health care professionals had a logical and succinct process to follow. They reflected on the predisposing facts of the situation to assist in the examination of the patient and consideration of the relevant information in a timely manner. The clinical reasoning process of examination can be transcribed into Russell's medical notes in the process followed which ensures all details are accounted for, fulfilling the duty of care.

Decision-making framework

In 2006 a review conducted by the Australian Nursing and Midwifery Council (ANMC) concluded that the introduction of a decision-making framework encouraged health professionals to become more accountable for their clinical decisions and provided novice nurses with an opportunity to develop their clinical knowledge and re-evaluate data as effectively as experienced nurses (Australian Nursing & Midwifery Council, 2006). Within this review the Nursing Board of Western Australia (NBWA) advocated utilising a specific framework for decision-making as this encouraged nurses' to 'think about what they were doing' and therefore improves their critical thinking. The review also found that nurses who utilised a decision-making framework became more empowered to turn down clinical practices they didn't feel competent in undertaking. They concluded that this leads to a

consistency of clinical practice standards and enhanced interprofessional communication as all staff followed the same decision-making process (Australian Nursing & Midwifery Council, 2006).

Conclusion

Clinical reasoning is an informed decision-making process that is being increasingly recognised as important for health care professionals working within a complex health care environment and caring for the increasingly multifaceted care needs of their patients. The ability to problem solve has been found to become more sophisticated with increasing clinical experience. However, the use of formal decision-making tools such as the 'Clinical Reasoning Cycle' outlined in detail above, facilitates sequential problem solving that allows health care professionals of all abilities and levels of experience to better assess, develop and implement the best care for their patients.

Medical glossary and acronyms

ANMC	Australian Nursing and Midwifery Council Administrates the regulation of nursing in Australia. Conducts assessments and registration of nurses.
Antiembolic stocking	Compression stockings used for the prevention of blood clots following a phase of inactivity.
Autonomic Dysreflexia	<p>A potentially life-threatening condition affecting persons with spinal cord injury. Warning signs include hypertension, migraines, rashes above the cord legions and convulsions. This condition is a medical emergency that if not treated immediately, can lead to stroke, seizures, and even death. Autonomic Dysreflexia occurs when an irritating stimulus is introduced to the body below the level of spinal cord injury, sending nerve impulses toward the brain via the spinal cord. These impulses are blocked by the lesion at the level of injury, activating a reflex which increases activity of the sympathetic autonomic nervous system, causing a rise in the blood pressure.</p> <p>Treatment usually entails administration of anti-hypertensive medication, removal of tight clothing, or catheterisation.</p>
Cardiac arrhythmia	An irregular heartbeat. The heart beat can be irregularly fast or steady and it might come on slowly or suddenly. Often termed as palpitations.
Clinical Reasoning	The process by which health care professionals make decisions about patient care.
Continuity	The continued holistic care of an individual.
Duty of care	Health professionals are obliged to adhere to a standard

of reasonable care for the health and safety of people in the workplace who may be affected by their acts, or their omissions.

GTN

Glyceryl trinitrate

Medication used by sufferers of angina, a condition where oxygen in the heart depletes, causing severe pain. GTN contains nitric oxide, a chemical which facilitates the flow of blood through blood vessels in order to carry more oxygen through the blood, reducing stress on the heart. GTN can be taken in tablet or oral spray form.

Hypertension

A medical emergency involving a severe elevation in blood pressure generally common in stroke or heart attack patients. Hypertension damages the blood vessels and stops the heart from pumping blood effectively. Symptoms include extreme anxiety, chest pain, severe headaches and seizures.

Interdisciplinary teams

A team that is collaboration-oriented. The team meets regularly to discuss and collaboratively set treatment goals and carry out treatment plans. There is a high level of communication and cooperation among team members (Korner, 2008, p. 2)

Intracranial Haemorrhage

A haemorrhage, or bleeding, in the skull caused by blood vessels rupturing and leaking. It can result from either physical traumas or non-physical traumas such as strokes or aneurysms.

MET

Medical Emergency Team

Comprised of staff possessing expertise in the management of an acutely unwell patient.

Multidisciplinary teams

A team that is discipline-oriented. Each professional

works in parallel, with clear role definitions, specified tasks and hierarchical lines of authority (Korner, 2008, p. 2).

NBWA

Nursing and Midwifery Board of Australia

Established to administrate the assessment, registering and accreditation of nursing and midwifery practitioners in Australia. The Board also develops standards and guidelines for the nursing and midwifery professions, as well as managing investigations and disciplinary hearings.

Passive mobilisation exercises

A form of therapy used by physiotherapists to loosen tight muscles, ligaments and tendons, to ultimately help increase mobility. The physiotherapist applies pressure to and moves the affected area, allowing the area to maintain a range of motion even where the patient is limited in how they can move the area themselves.

Reflective practice

An approach where a person deliberately reflects on their thoughts and actions in a situation, and then evaluates the effectiveness. It is a method of self-learning with the intention of developing a person's critical thinking and understanding skills.

Seizures

An episode of abnormal brain activity that causes changes in alterations in behavior. A seizure can be brought on by a number of medical issues, including fever, chronic pain, trauma, fevers or high/low blood sugar levels.

Tetraplegic

A person who has sustained a spinal cord injury resulting in complete or partial sensory and/or motor loss of all limbs and the torso.

Further information

Australian Health Practitioner Regulation Agency: <http://www.ahpra.gov.au>
or 1300 419 495

An organisation which aims to regulate health practitioners in Australia. AHPRA advocates a strong and competent health workforce in order to improve the quality of health care in Australia. AHPRA provides advice and support to various national health boards and councils within Australia.

Australian Resuscitation Council: <http://www.resus.org.au>
Represents and coordinates the teaching and practice of resuscitation.

Health Workforce Australia: <http://www.hwa.gov.au>
or 1800 707 351

Health Workforce Australia is an organisation established to assist in providing the community with a skilled and innovative health workforce. HWA is currently engaged in a project to increase capacity in Australia's health system through the provision of clinical training using Simulated Learning Environments (SLE).

Spinal Cord Injuries Australia: <http://scia.org.au/>
or (02) 9661 8855

Provides information and support services to spinal cord injury sufferers and their families. Services include employment assistance, financial support, teaching people how to gain independence in the home, workplace injury prevention guides and peer support groups.

References

- Aitken, L. (2003). Critical care nurses' use of decision-making strategies. *Journal of Clinical Nursing, 2*, 173-177.
- Australian Medical Association. (2011). The Role of Simulated Learning Environments in Postgraduate Medical Education and Training - Position statement, from <http://ama.com.au/node/7314>
- Australian Nursing & Midwifery Council. (2006). A National Framework for Decision Making by Nurses and Midwives about Scopes of Practice: Australian Nursing & Midwifery Council.
- Baker, C., Pulling, C., McGraw, R., Dagnone, J. D., Hopkins-Rosseeeld, D., & Medves, J. (2008). Simulation in Interprofessional education for patient centred collaborative care. *Journal of Advanced Nursing, 64*(4), 372-379.
- Benner, P., Hughes, R. G., & Sutphen, M. (2008). Clinical reasoning, decision-making, and action: thinking critically and clinically. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*.
- Boyd, G. (2011). Education debate: Clinical diagnostic reasoning. *Internal Medicine Journal - Royal Australasian College of Physicians, 57*3-576.
- Braithwaite, J., Westbrook, J. I., Foxwell, A. R., Boyce, R., Devinney, T., Budge, M., et al. (2007). An action research protocol to strengthen system-wide inter-professional learning and practice. *BMC Health Services Research, 13*(7), 144.
- Canadian Interprofessional Health Collaborative. (2010). A National Interprofessional Competency Framework. Vancouver: University of British Columbia.
- Canadian Interprofessional Health Collaborative (CIHC). (2008). Knowledge transfer and exchange in interprofessional education: synthesizing the evidence to foster evidence-based decision-making. Vancouver, Canada: University of British Columbia.
- Centre for the Advancement of Interprofessional Education. (2002). Defining IPE, from <http://www.caipe.org.uk/about-us/defining-ipe>
- Claydon, V. E., & Krassioukov, A. V. (2006). Orthostatic hypotension and autonomic pathways after spinal cord injury. *Journal of Neurotrauma, 23*, 1713-1725.
- Ebright, P., Patterson, E., Chalko, B., & Render, M. (2003). Understanding the complexity of Registered Nurse Work in acute nurse settings. *Journal of Nursing Administration, 33*(12), 630-638.

- Freeth, D. S., Hammick, M., Reeves, S., Barr, H., & Koppel, I. (2005). *Effective interprofessional education: development, delivery, and evaluation*. Noida: Blackwell Publishing.
- Gaba, D. (2004). The Future Vision of simulation in healthcare. *Quality in Health Care*, 13(1), 2-10.
- Institutes of Medicine. (2003). Health professions education: A bridge to quality. Retrieved from www.iom.edu/CMS/3809/46345914.aspx
- Jevon, P. (2010). How to ensure patient observations lead to effective management of altered consciousness. *Nursing Times*, 106(6), 17.
- Jones, J. (1988). Clinical Reasoning in Nursing. *Journal of Advanced Nursing*, 13, 185-192.
- Kenaszchuk, C., MacMillan, K., van Soeren, M., & Reeves, S. (2011). Interprofessional simulated learning: short term associations between simulation and interprofessional collaboration. *BMC Medicine* 2011, 9(29).
- Korner, M. (2008). Analysis and development of multiprofessional teams in medical rehabilitation. *GMS Psychosocial Medicine*, 5(13), 2.
- Levett-Jones, T., Hoffman, K., Dempsey, Y., Jeong, S., Noble, D., Norton, C., et al. (2010). The 'five rights' of clinical reasoning and educational model to enhance nursing students' ability to identify and manage clinically 'at risk' patients. *Nurse Education Today*, 30(6), 515-520.
- Round, A. (2001). Introduction to Clinical reasoning. *Journal of Evaluation in Clinical Practice*, 7(2), 109-117.
- Sargent, S., Loney, E. & Murphy, G. (2008). Effective Interprofessional Teams: "Contact is not enough" to build a team. *Journal of Continuing Education in the Health Professions*, 28(4), 228-234.
- Simmons, B. (2010). Clinical reasoning: Concept analysis. *Journal of Advanced Nursing*, 66(5), 1151-1158.
- Thompson, C., & McCaughan, D. (2002). The value of research in clinical decision making. *Nursing Times*, 98(42), 30-36.
- University of Newcastle. (2009). Clinical reasoning : Instructor resources. Newcastle: School of Nursing and Midwifery, University of Newcastle.
- World Health Organization. (2010). Framework for action on interprofessional education and collaborative practice. In D. Hopkins (Ed.). Geneva: World Health Organization.