

Clinical Initiatives Nurse in Emergency Departments

Educational Program



Resource Manual 2011



Health

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Introduction

The Clinical Initiatives Nurse (CIN) Education Program

The CIN Role builds on knowledge and experience gained as the Registered Nurse (RN) progresses on their specialty career path and becomes proficient working in all areas of the Emergency Department (ED). However, there are several unique aspects to this role, in that it requires the nurse to holistically manage the waiting room which includes re-assessment, care initiation and provision of symptom management for undifferentiated patients. Hence, while the RN in the CIN role may have well developed communication, assessment and care initiation skills, the CIN role will demand further expansion of these skills to meet the needs of the waiting room environment. This education program aims to provide the core knowledge base and skill set to prepare the RN to work confidently in this role.

This Resource Manual is the core document for the program and is complemented by both the Participant Workbook and the Facilitator's Manual. Within the Emergency Department participants will be supported by staff to meet the relevant learning objectives during the 3 – 6 months over which this program extends.

What is in this manual?

This manual provides the majority of the core knowledge for the CIN role. It is to be used in conjunction with the CIN Participant Manual.

What is not in this Manual?

This package aims not to replicate educational material already widely used in EDs (such as; an ED nursing textbook Emergency Triage Education Kit or the DETECT manual). Hence the CIN participant is encouraged to read from wider sources and engage in active learning with their facilitator, experienced RNs, medical officers, pharmacists or other CINs, as doing so will assist in completing the course. In some cases the CIN participant will need to consult other texts in order to complete the learning activities.

Acknowledgements

The Clinical Initiatives Nurse (CIN) Education Program has been developed to align with the redesign of the CIN role in 2010. NSW Health would like to thank the following members of the CIN Education Working Party, who have been integral to the development and review of this document.

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Section 1

1.1 Introduction to the Clinical Initiatives Nurse Role

Statement of Purpose

The aim of this module is to define the Clinical Initiatives Nurse (CIN) role and detail the key elements that underpin the role. this will enable the CIN to develop an understanding of the objectives and accountabilities of the CIN.

Learning Outcomes

At the completion of this module the participant will be able to:

Demonstrate knowledge of the following:

- The purpose of the CIN Role
- The CIN role as an ED team member
- The accountabilities and role boundaries
- The outcomes of the role
- The experience and knowledge required for the role
- Analyse and reflect on what constitutes care initiation.

Background

The CIN role was introduced into major NSW Emergency Departments in 2002.

The Aims for the CIN role in 2002 included:

- Providing education and advice to patients and their family's whilst waiting to be seen
- Facilitate the reassessment/re-triage processes in the ED waiting room
- Assessing patients and constructing a plan of care for each patient in consultation with a senior emergency medical officer.

In 2009 The Garling Special Commission of Inquiry into Acute Care services added CIN roles into all EDs who had >25 000 ED presentations in 2007-2008. CIN was declared to be a vital position, caring for people waiting in EDs for medical reviews. The Special Commission of Inquiry report noted that the CIN position was frequently re-deployed during 'busy periods' which was the 'very time' that it was most needed to 'provide close observation of patients in the waiting room and initiation of treatment where required'.

In 2010 NSW Health and the Ministerial Taskforce for Emergency Care commissioned a review of the role. All sites that have CIN funding were consulted; and Emergency Department clinicians decided on the key elements of the role. This resulted in the development of a NSW statewide CIN role.

CIN Role Description

Purpose of the CIN Role

The primary purpose of the CIN role is to provide nursing care to patients in ED waiting rooms.

The care delivered by the CIN is prioritised in the following way:

- Maintenance of an ED nursing presence in the waiting room to facilitate a safe clinical environment
- Communication with patients and carers regarding ED processes, waiting times and provision of relevant education on their health issues
- Assessment of patients following triage with a view to:
 - Initiation of diagnostics or treatment
 - Escalation of care, where required
 - Appropriate referral of patients to suitable services, which may be external to the ED as per locally agreed protocols (eg MAU or Inpatient Teams).

The CIN as an ED team member

Although the CIN role is self-directed in many ways, it is important that the CIN recognises they remain part of the ED team and foster good working relationships to provide coordinated patient care.

In particular the CIN works closely with the following roles to facilitate care:

Triage Nurse

- To prioritise patient re-assessment and care initiation
- To facilitate re-triage as required.

Nurse Team Leader (Clinical NUM/NM)

- To elevate concerns regarding waiting room management (eg escalating aggression/complaints)
- To facilitate referral of patients as appropriate/required (eg to MAU)
- To escalate clinical care for the deteriorating patient.

Medical Team Leader/or Delegate

- To facilitate care (especially where patients can be rapidly treated with minimal medical collaboration)
- To facilitate referral to other services (eg inpatient team as appropriate)
- To escalate clinical care for the deteriorating patient
- To promote the CIN role to medical staff that rotate through the ED (as applicable).

Others

- Clerical staff
- Specialist ED services (eg ASET, Mental Health Liaison, Physio)
- External (to ED) referrals (eg Inpatient teams, MAU)
- Allied Health
- Fast track and Acute Care Nurses in ED to handover ongoing care.
- Nurse Practitioner/CNC 3.

Accountabilities

The CIN role has a number of accountabilities which relate to caring for patients who are waiting for definitive treatment.

If, at any time, the role demands become overwhelming it is imperative that the CIN raises these concerns with the nurse in charge of the ED.

The following accountabilities relate to the CIN role:

- Ongoing review of waiting room patients to detect changes in clinical urgency
- Regular communication with patients and carers in the ED waiting room to keep them informed of their waiting status, ED processes and promote patient focused service delivery. (The visible presence of a CIN in the waiting room, and the proactive management of communication can lead to a reduction of anxiety, and aggressive incidents)
- Liaise with the:
 - Triage Nurse to re-triage patients in accordance with changes in patient acuity
 - Nurse and Medical team leaders in ED to escalate care needs as required
 - ED clinical team to provide continuity of care for patients who have been redirected back to the waiting room for monitoring or interventions following clinical review
 - External services to refer patients where appropriate (Eg Medical Assessment Unit)
- Prioritise patient management and initiate CIN protocols in accordance with local guidelines and policy. Assessment and management of patient's pain is a key priority
- Hand over patient care to the appropriate caregiver when the CIN has reached the boundaries of the CIN protocol (E.g. maximum analgesia has been given and the patient has continued pain) or when the patient is moved to a definitive care area such as acute care or fast track
- Solve problems based on operational knowledge and experience, looking for underlying causes and evaluate applied solutions. Refer unresolved problems
- Document patient care and/or interventions
- Utilise a team approach to facilitate patient flow and reduce repetition in patient care
- Practice in a safe manner and maintain a safe care environment for self and others.

Outcomes expected from having a CIN role

The CIN Role is expected to contribute to the achievement of the following key outcomes, which reflect quality care of the ED patient:

- Sustained improvements on the NSW Health Patient Survey for Non Admitted ED patients in the following existing categories:
 - satisfactory waiting time in the ED,
 - staff doing all they can to control patient's pain and
 - enough information about condition/treatment.
- Did Not Wait numbers reduced.
- Improved time to analgesia for patients triaged to the waiting room
- Reduction of adverse events in the waiting room.

Experience and knowledge required for the role

The following is a list of the professional requirements for the CIN Role.

- Registered Nurse with appropriate emergency nursing experience across a broad range of ED roles
- Confidence, knowledge and experience to practice proactively in a self directed role with awareness of role scope and boundaries. This requires a balance of judgment and assertiveness to seek assistance where required
- Demonstrated ability to interact and respond to others in a personable and professional manner which takes into account unexpressed concerns. This requires well developed listening and questioning skills and ability to negotiate for the desired outcomes
- Demonstrated ability to read situations effectively and use a range of conflict resolution strategies to address conflict. This includes the ability to build rapport and negotiate to assist in resolving conflict and to seek guidance from others when needed

- Demonstrated team approach to ED care with the ability to liaise confidently across professional boundaries
- Knowledge and application of analytical thinking skills demonstrated by ability to apply experience and knowledge to initiate interventions and solve problems
- Working knowledge of local service delivery models and appropriate referral pathways
- Completion of CIN educational program and competency in the use of relevant CIN practice protocols.

* *More information on this can be found in the CIN Role Description.*

Key Points

- The CIN role is prioritised to caring for patients waiting in ED waiting rooms
 - The aims of the role are: Review of patients post triage to detect changes in clinical condition, communication and reassurance and commencement of clinical care, particularly managing pain
 - The CIN works collaboratively with other ED team members to provide co-ordinated care.
-

Activities 1 and 2

Complete Activity 1 & 2 in Module 1 of the CIN Participant Manual.

NSW Health Memo 2006

Nurse Seen Time in EDs

To All Area CEs

Issued 27 February 2006

Triage waiting times – early commencement of care for Emergency Department patients

The Australian College for Emergency Medicine issued the Australasian Triage Scale¹ “to ensure that patients are treated in order of their clinical urgency, which refers to the need for time-critical intervention. Implicit ... is the assumption that the clinical outcome may be affected by delays to assessment and treatment beyond the recommended times”.

As you will be aware, a key performance indicator for safe access to emergency care is waiting-time by triage category.

This time, from the time of triage to the time treatment commences, has benchmarks for each triage category as outlined below:

Triage 1 < 2 mins	100%
Triage 2 < 10 mins	80%
Triage 3 < 30 mins	75%
Triage 4 < 60 mins	70%
Triage 5 < 120 mins	70%

Performance across the state has been at or very close to target for the most critical Triage categories 1 and 2 for some time.

I congratulate you on your performance for the patients who need immediate emergency care. However, for the bulk of patients who fall into Triage categories 3 and 4, patients have been waiting too long for treatment to commence. There are a number of factors behind this failure to meet the benchmark time to treat Triage 3 and 4 patients.

Reducing ED overcrowding by decreasing access block is one pre-requisite to achieving timely initiation of care, and this has been substantially achieved at a large number of hospitals. Access block continues to remain at lower levels than previous years, and credible plans are in place to reduce it further.

However, there are a number of initiatives that must be undertaken within Emergency Departments to ensure patients receive treatment within recommended timeframes. An integral part of this is the recognition of the role of nursing staff in the early initiation of clinical care and the value it adds to the patient journey and satisfaction.

Currently, there is little consistency in the way information is collected regarding the initiation of timely and appropriate active treatment. This has led to an under-reporting of the proportion of patients who do in fact receive timely initiation of care from nursing staff.

In July 2001, a Memorandum was issued relating to Emergency Department waiting times and the commencement of treatment. **The definition of ‘time that treatment has commenced’ was modified to include instances where nursing staff commence active treatment according to an approved protocol.** The Emergency Care Taskforce has recently re-affirmed that the emphasis should be on a team-based approach to care, not “waiting to see a doctor”. Emergency Departments should have systems in place that allow time critical interventions to be initiated by nursing staff in order to address the patient’s clinical urgency identified by the triage category.

Recently, there has been some confusion about the application of the definition, what constitutes active commencement of treatment and where nurse seen time may be captured. In order to assure consistency and reproducibility the following advice is issued.

¹ *Australasian College for Emergency Medicine, Guideline on the implementation of the Australasian Triage Scale in Emergency Departments (G24), November 2000, revised August 2005*

Nurse seen time may be captured as time of commencement of active treatment where treatment is commenced using:

- Formal clinical pathways - these may include (but not be restricted to) chest pain, asthma, stroke, etc. or those which use clinical order protocols for the initiation of radiological and pathology investigations
- The NSW rural emergency clinical guidelines for adults
- Protocols that include both assessment and treatment. Examples of these include:
 - Isolated limb injuries (including sprains, strains, minor fractures, assessment against Ottawa ankle rules and the initiation of rest, ice and elevation)
 - Abdominal pain
 - Wound management (not first aid)
 - Fever
 - Minor PV bleeding
 - Chest pain
 - Shortness of breath
 - Gastroenteritis and oral hydration.
- Medication standing orders for pain relief, symptom control and tetanus prophylaxis
- Any care delivered by a nurse practitioner.

The range and type of clinical protocols available to be used will vary from department to department. It is essential that the clinical protocols used by nursing staff are supported by a formal education and accreditation process to ensure competency in the application of the clinical protocol.

Under the definition of commencement of active treatment, nurse seen time **should not** be captured in the following instances.

- Undertaking physiological observations
- Urinalysis
- Undressing of patients and preparation for examination
- Routine pathology collection, and placement of an IV, which is not part of a clinical pathway.

Capturing the time active treatment commences (regardless of who commences it) is essential in providing information about the outputs of care and in ensuring that active treatment commenced is safe, appropriate and occurs in a timely way.

The NSW Health Emergency Care Taskforce has developed the elements and principles that support the ideal journey of all patients as they travel through an Emergency Department. These principles have been used to underpin new Models of Emergency Care that are focused on changing the way patients are managed. The Models of Emergency Care have been developed to address various aspects of current service delivery and focus on streamlining the patient journey. Your efforts to improve early commencement of care should be integrated with implementing these new models of emergency care.

If you have any questions about this, please contact Raj Verma (rverm@doh.health.nsw.gov.au) on 9391 9558.

Yours faithfully,



Katherine McGrath,
Deputy Director General,
Health System Performance

1.2 CIN Communication and the Waiting Room

Statement of Purpose

The aim of this module is to emphasise the importance of the CINs understanding and management of patient and carer anxiety in the waiting room through effective communication. This will enable the CIN to display an understanding of the communication needs of the patients and carers in the waiting room and develop strategies to meet these needs.

Learning Outcomes

At the completion of this module the participant will be able to:

- Outline the key principles of the Psychology of Waiting
- Identify key learning from previous research on the ED waiting room experience
- Discuss strategies to effectively and efficiently manage communication in the waiting room
- Discuss challenging communication situations in the waiting room and the CIN role
- Analyse and reflect on applying learning to 'real life scenarios'.

Psychology of Waiting

The experience of waiting can be frustrating. Studies of the waiting experience have shown there are common psychological principles that apply to the waiting experience (Maister, 2005). They are:

1. Occupied time feels shorter than unoccupied time
2. People want to get started
3. Anxiety makes waiting seem longer
4. Uncertain waits are longer than known waits
5. Unexplained waits are longer than explained waits
6. Unfair waits are longer than equitable waits
7. The more valuable the service is perceived – the longer the person will wait
8. Solo waits feel longer than group waits.

Considering each of these factors – many of the design features of the ED waiting room, and the way the ED service is structured, actually contribute to making the waiting experience less enjoyable for our patients and carers.

Waits are often uncertain, may appear unfair (as people who arrived later go through first), may be unexplained and the time is spent largely unoccupied.

Additionally patients and carers arrive and wait while feeling anxious and afraid, concerned about what may happen to them and the degree of their injury or illness (Yoon & Sonneveld, 2010). They may, however, be prepared to wait for long periods, as they perceive the value of the service they will receive to be high.

Knowing the principles from the psychology of waiting (listed above) the CIN can make simple interventions which may reduce some of the anxiety and frustration of patients and carers in the waiting room.

Research

In a review of qualitative studies on ED patient experiences, the researchers found that patients report feeling vulnerable, anxious, fearful and stressed when they arrive at Emergency Departments, and many are experiencing pain. Patients felt grateful when staff members were perceived as being friendly and attentive to the patient's needs, anticipated needs, made eye contact and displayed listening skills.

The following were associated with people describing 'negative feelings':

- Patients with non-urgent conditions believed they were de-valued because they perceived they were guilty of exerting pressure on overworked nurses, and
- Their self esteem was threatened by being deemed an 'inappropriate attendee' (Gordon, Sheppard & Anaf 2010).

Waiting had a significant impact on the patient's ED experience. Factors that influenced the experience of waiting were not solely the length of the wait but also on related to insufficient information about why they were waiting, how long they were expected to wait, the interaction with staff during the wait and the environment (comfort) of the wait.

Yoon and Sonneveld (2010) observed patients in ED waiting rooms, and found that the patients were concerned they had been given incorrect triage categories, which could contribute to anger, fear and anxiety. When they did not receive updates from staff these feelings continued, and patients were unable to focus on reading or other distractions due to their concerns.

Research on staff attitudes to patients in the waiting room does support some of what patient's feel. Meyer and Coates (1998) asked ED nurses to examine their attitudes regarding whether the person who is triaged to the waiting room is more of a 'patient' or 'customer' compared to a patient wheeled in by ambulance with a suspected Myocardial Infarct. ED nurses frequently replied that patients who did not require beds were more of a 'customer' and this influenced some nurse's attitudes towards caring for them. As critical care nurses working in busy EDs, the nurses were more in tune with the needs of critically unwell patients, and less aware of the needs of patients with minor injuries or illnesses who frequently present.

Meanwhile an ED in Canada reviewed the effects of creating a position to reassess patients in the waiting room, and liaise with the triage nurse (Blank, Santoro, Maynard, Provost & Keyes 2007). The study was undertaken in an ED that had greater than 100,000 presentations per year.

In a 3 month period 95 patients were found to have deteriorating signs in the waiting room, however there were no adverse events. Triage nurses reported decreased stress levels, as patients were being re-assessed and the number of Did Not Waits decreased. Thus it was shown that this position improved safety in the waiting room.

Similarly it has been found that approaching patients and pro-actively managing their needs results in less requests or demands being placed on the nurse, as well as higher patient satisfaction and decreased adverse events (Meade, Bursell & Ketelsen 2006).

Communication Strategies for the CIN

Armed with an awareness of:

- 1) the psychology of waiting,
- 2) the effects the CIN can have on improving safety in the waiting room, and
- 3) the factors that worsen or enhance the waiting room experience, the CIN is well placed to provide care in the waiting room.

Regular, proactive contact with patients in the waiting room is aimed at:

- Relieving anxiety and fear for patients and carers
- Updating patients about their wait and providing appropriate education to patients and carers
- Addressing the concerns patients and carers may have and
- Re-assessing the patient to detect signs of deterioration.

The CIN is also able to commence care or 'get people started', and in many instances assist with pain relief. It is important to let people know their care has commenced as this improves the experience of waiting.

A strategy to assist the CIN in meeting the communication and re-assessment aspects of the role is to use a standard communication approach for patients and carers.

The following has been developed at a NSW ED and uses the A-E of patient communication (easy to remember as ED nurses are used to the A-E of patient assessment). It reminds us of the essential elements of communication – eye contact, respect and builds in elements raised in the section on the psychology of waiting.

A to E of Communication* stands for:

A *Acknowledge their presence*

- Make eye contact
- Use the patient's name
- Acknowledge patients and carers present.

B *Be Yourself*

- Explain who you are and what you do
- Establish teamwork.

C *Communicate the Plan*

- Explain what you are doing and why, and let them know if you are commencing their care
- Explain what to expect and what will happen next and use active listening to confirm that this is understood

D *Duration and Timeframe*

- Tell them the expected wait time
- Explain when you will be back and how they can contact you.

E *Explore their Needs*

- What questions/concerns do they have?
- Is there anything they need while they are waiting?

* Developed by Campbelltown ED in partnership with Studer as part of the Improving Staff and Patient Experience Program.

Key Points

- Giving people a timeframe for waiting is important – even if it later has to be amended. Estimate the duration, making sure to give the maximum estimate, but don't exaggerate. If new problems arise, let everyone know
- Proactively asking if the waiting person requires anything will reduce them coming back to ask for something when you are busy
- Using a communication strategy will assist the CIN in improving the waiting experience for patients, carers and staff.

Communicating in Difficult Circumstances

- When problems arise in the waiting room, in the form of people becoming agitated, it is important to address them immediately. Emotions are contagious
- Use the principles of aggression management – talk calmly with an open body posture and use empathy to allow the person to name their concerns
- Provide a clear, unambiguous model of how the ED system operates
- Avoid such phrases as "I can't promise anything" or "I can't say for sure. It's a zoo today"
- Empathise; the annoyance of waiting is also magnified when staff members don't seem concerned or apologetic about the long delay
- Remember there are cultural differences in queuing behaviour. In some cultures there are no queues, instead the person who attracts attention is the first to be served, thus education may be required.

Communicating with people who are affected by Alcohol

- People affected by alcohol generally:
 - are less likely to comply with requests
 - are more likely to over-react to verbal or non-verbal cues
 - are more likely to focus on service shortcomings not their own behaviour
 - have a shortened attention span
 - see themselves as more important, more powerful than when they are sober
 - can be ready and willing for confrontation
 - may be only concerned with their immediate demands, future consequences are often irrelevant.

Tips for communicating with people affected with Alcohol

- Standing too close or talking loudly may be seen as provocation
- Act early
- Don't provoke if possible
- Be aware of your posture and facial expression
- Be calm and respectful
- Avoid challenging and promises that you cannot deliver
- If you are able to remain safe, stay side on, sit down and encourage them to sit – this can de-escalate behaviour
- Know yourself (on the day, are you able to manage this today? What else is going on for you?)
- Ensure you have training in aggression minimisation and practice or update this training regularly
- Know where when and how to get support.

For further information on this topic see the following Policies and Guidelines from NSW Health.

- Know the NSW Health Policy or Guidelines on dealing with difficult behaviour and managing patients who are intoxicated.

Resources include:

- Zero Tolerance Response to Violence in the NSW Health Workplace. Document Number PD2005_315
- Drug and Alcohol Withdrawal Clinical Practice Guidelines – NSW. Doc No: GL2008_011
- Nursing & Midwifery Clinical Guidelines - Identifying & Responding to Drug & Alcohol Issues. Document Number: GL2008_001.

Training guidelines for the CIN should align with those outlined in:

- Training Program - A Safer Place to Work: Preventing/Managing Violent Behaviour - NSW Health. Document Number PD2005_316.

Communicating to other Health Professionals

The CIN is a pivotal team member of the ED. They work closely with the NUM or Team Leader, the Triage Nurse, Senior Medical Staff, Nurse Practitioners and may refer patients to inpatient teams or consultants (such as Mental Health CNCs). Effective verbal and written communication skills are required for the CIN role.

The CIN and Triage

The CIN and Triage roles need to have a good working relationship, as they effectively work together at the front of the ED. While the roles are complementary it is important to recognise the role boundaries, so that the CIN does not become another triage nurse, and is able to care for patients who have already been triaged.

Different EDs may have slightly different guidelines to the re-triaging of patients whose condition deteriorates in the waiting room. Ideally the CIN should refer these patients back to the Triage Nurse, and this should be done respectfully. If the situation is urgent, or the Triage Nurse is overwhelmed the CIN may be able to re-triage the patient, and escalate their care accordingly. It is important to later discuss this with the Triage Nurse, giving them an overview of how the patient's condition had changed and the actions taken.

The CIN referral/handover of patients to other staff

Whether referring a patient, escalating their care or handing over once the patient is moved into another area, it has been recognised that using a standard approach such as ISBAR not only ensures the most important information is conveyed, but is also respectful of using other's time well. It ensures the person handing over has all of the information at hand that needs to be conveyed. A small amount of preparation of the handover will pay off as it conveys a professional approach which will aid patient care.

Activity

Complete Activity 1 & 2 in Module 1.2 of the CIN Participant Manual.

Further Resources/Reading/References

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1.3 Management of the Waiting Room

Statement of Purpose

The aim of this module is to emphasise the importance of maintaining a safe and efficiently functioning ED waiting room and provide the CIN with strategies to manage the waiting environment.

Learning Outcomes

At the completion of this module the participant will be able to:

- Demonstrate effective communication aimed at minimising patient and carer anxiety
- Demonstrate effective assessment and prioritisation in managing clinical scenarios in the waiting room, through using appropriate clinical initiatives, communication, documentation and referral
- Demonstrate ability to prioritise CIN activities in a busy waiting room and escalate concerns regarding activity to promote patient safety as a key outcome
- Develop competency in aligning patient care and referral processes using local protocols and policies to promote patient flow in the ED
- Identify and manage the early signs of aggression
- Develop strategies to maintain privacy and dignity in the waiting room.

Priorities in the Waiting Room

Safety for all patients in the waiting room is paramount. Priorities for the CIN role are:

1. Hourly rounds in the waiting room – to promote communication and patient safety
2. Reassessment of Triage Category 3 patients
3. Pain relief
4. Assess and initiate further diagnostics or care as appropriate.

Safety

The demands of the waiting room are constantly changing. There could be one patient waiting and within a short time there could be many. The waiting time may be minutes or it could be several hours. The acuity and needs of patients and their carers will vary.

Managing patients within the waiting room is different to that of managing a set number of patients inside the Emergency Department.

Maintaining safety for all the patients in the waiting room is the primary aim of the CIN. It is important for the CIN and the patients in the waiting room to know that they are safe. It is equally important that patients and their carers are confident that they have been adequately assessed.

Hourly rounds are an important and effective way of re-assessing patients and keeping them informed. It may not be realistic for the CIN to complete a full set of hourly vital signs on all patients in a busy waiting room, although this may be a standard in some EDs. Hourly rounds of the waiting room can be attended in a short time frame if they are systematic and focused.

The round consists of:

- The CIN introducing her/himself and the CIN role to every patient in the waiting room and checking the patient name and presenting problem against a waiting room list. This communication is brief, explaining that the role of the CIN is to ensure that all patients are safe
- The assessment that occurs is an “eyeball” assessment, informed by the triage assessment of the patient and the patient's current appearance (does this information match or are there red flags which concern the CIN?). This enables the CIN to prioritise patients who require;
 - a more thorough assessment
 - immediate treatment
 - pain relief, or
 - treatment that can be commenced at a later time.
- Reassuring patients that you will be in the waiting room and available if they need to ask questions or are concerned about their condition.

There is a twofold purpose to hourly rounding:

- Briefly assess and detect any deterioration in the patient's condition
- Communicate with patients to decrease anxiety, gain compliance, demonstrate respect and reduce aggression in the waiting room through understanding.

As a last resort, if the number of patients in the waiting room is large and it is not possible to speak with them individually, then a general statement can be made to the waiting room. This statement should include your name, role and that you will aim to speak individually to everyone, but are available should anyone have an urgent concern.

▶ **Red Flags**

- Multiple presentations at once
- Patients complaining about the wait
- Increasing numbers of patients starting to complain
- Waiting room toilets/areas are out of view.

Assessment

The type and frequency of assessment will depend on the number of patients in the waiting room and the acuity of the patients. The assessments will be focused on the presenting problem.

Assessments on the hourly round will be a brief “eyeballing” of the patient whilst you are introducing yourself and your role and may include:

- Posture of the patient; do they appear to be in pain? ie doubled up or splinting a body region
- Facial expression
- Alertness and orientation
- Colour of skin
- Feel of the skin: is it dry or clammy?
- Radial pulse
- Work of breathing
- Neurovascular observations colour, warmth, sensation and movement
- Early signs of aggression ie pacing, clenched fists, raised voice, repetitive questioning.

If what you are seeing, or what the patient is telling you, does not match with the triage history you have, a more in depth assessment is warranted.

Reassessment of patients meeting triage category 3 benchmark times are usually required to be more thorough and may include full set of vitals, BSL, ECG or a more detailed history. Patients with other triage categories may also require these interventions, as identified on an individual basis, eg increasing pain, progression of symptoms.

Red Flags

- Uncontrolled pain
- Deterioration in vital signs
- Changes in ABCD
- Early signs of aggression.

Communication

Communication in the waiting room is covered in more detail in module 2. Communication with patients and their carers in the waiting room is generally concise and may contain closed questions rather than open ended questioning (eg “has your pain improved” as opposed to “tell me about your pain”). All communication should be based on A-E of communication.

- A** Acknowledge the patient by their name
- B** Be yourself: Introduce yourself by name and explain the CIN role
- C** Communicate what you are about to do and what the plan is. Explain what you are doing and why, and let them know if you are commencing their care
- D** Discuss the Duration eg expected time frames
- E** Explore their needs eg check for understanding? Do they have any questions?

A significant percentage of communication is body language. If you smile, gain eye contact and appear approachable and confident, patients in the waiting room are more likely to trust you, be compliant, and work with you.

Communication via written or audiovisual media can supplement information given by the CIN. Posters or pamphlets that explain how the Emergency Department or CIN role work are helpful. Videos or information on topics such as how the triage system works, the role of nurse practitioners or clinical issues such as how to treat fevers in children are also useful.

▶ **Red Flags**

- Increasing signs of aggression
- Extended waiting times
- Patients presenting with a history of drug and alcohol use, mental health issues, developmentally delay or sensory deficits.

Documentation

Documentation is in the Electronic Medical Records (EMR) and in the clinical records.

If you have commenced treatment according to your department standing orders, guidelines or policies, it must be entered into the EMR. If you are entering the data retrospectively, ensure the time is recorded to reflect when treatment was commenced.

Documentation in the clinical notes should reflect all communication, assessments and treatments completed. Stamps or stickers may help reduce the amount of repetitive documentation ie "CIN round attended".

In addition, some departments may keep records when hourly rounding has been attended.

Standing orders and policies

All departments have role descriptions, and most have standing orders relating to the scope of practice of the CIN.

Be familiar with these documents. Be aware of the medications that nurses are permitted to administer with and without a standing order.

There are a number of NSW Health Policies that relate to the CIN role, covering such topics as ED patients awaiting care, management of patients with mental health issues, management of patients with alcohol intoxication and management of the patient with bleeding in early pregnancy. Many policies are mentioned in the appropriate module in the CIN education package.

As an experienced emergency nurse you need to be aware of other resources within the organisation that may expedite assessments and treatments such as a drug and alcohol liaison service, social worker, mental health personnel and diabetic educators. The scope of the CIN role to refer patients to such services should be clarified locally.

Privacy and dignity

It is challenging to maintain the patient's dignity and privacy in the waiting room. However, more patients complain of lack of information rather than privacy issues. If you are unable to take the patient to a CIN area, be aware of how loudly you are speaking. It is important to address the patient by their name for safety reasons.

To assist with patient privacy the CIN can print the waiting room screen off the EMR (which will include the patient presenting problem), or create a list of waiting patients with patient stickers that can be updated regularly.

All assessments that include history taking, abdominal and respiratory assessments, sensitive issues and invasive procedures should be attended in a CIN area or other private area.

Handover and Graded escalation

The key role of the CIN is to detect the deteriorating or sick patient in the waiting room. After identifying a patient at risk, the CIN needs to perform a thorough assessment. If the CIN deems the patient is unsuitable for the waiting room, they must refer to the appropriate role (eg triage nurse, nursing team leader or medical officer).

Using the ISBAR format can improve the efficiency and effectiveness of the referral.

- I** INTRODUCE yourself and your role
- S** STATE THE SITUATION
- B** BACKGROUND
- A** ASSESSMENT
- R** RECOMMENDATION

The information should be; concise, thorough, professional and respectful of the other's role and responsibilities.

If escalation is required, graded assertiveness is initiated. Graded assertiveness can be used to successfully challenge team leaders to ensure patient safety in a timely manner.

Graded assertiveness uses the PACE acronym:

- P** PROBE (eg initial discussion relating to availability of treatment areas)
- A** ALERT (eg Concerns over deteriorating vital signs)
- C** CHALLENGE (eg Highlight the deterioration and possible adverse outcomes)
- E** EMERGENCY (eg Escalate to hospital response, ie; MET).

Document the assessment and all communication regarding patient care and disposition in the clinical notes.

Red Flags

- Prioritising patient needs especially when 2 or more patients require urgent treatment
- Concerns are not being addressed.

DNW/Left treatment not complete

It is known that having an experienced CIN with good communication skills can reduce the number of patients who leave the ED due to anger and frustration without having treatment.

Most waiting rooms have clear signage requesting patients to present to the triage nurse if they are leaving the department without treatment. The Triage and /or CIN have a duty of care to the patient wanting to leave. If the patient is competent then they cannot be restrained. However, the nurse has a responsibility to warn the patient of the consequences of such a decision, and document all the consequences discussed with the patient in the clinical notes. Written information such as head injury advice forms should be given if available. Also, advice regarding under what circumstances the patient should return the hospital must be discussed and documented in the clinical notes.

If the patient has cognitive impairment from drug or alcohol use, head injury or mental illness they are at risk of adverse events. The nurse must recognise their duty of care in such cases.

Patients or parents deciding to leave after reassurance or commencement of treatment by the CIN can be a different situation.

They may now be confident to seek help elsewhere, are making an informed decision and are leaving the hospital happy with the care they have received. The CIN still needs to document the assessment and discussion in the clinical notes outlining information given, treatment options discussed and what advice was given regarding when to return to the hospital.

Patients who decide to leave after the initiation of diagnostic tests such as pathology or x-ray should be advised to wait for the results of those tests, or given information about how to access the results. Where this situation occurs, the CIN would be best advised to escalate the situation to a clinician to review the results and decide on the best course of action. In the situation where the CIN initiates investigations and the patient leaves prior to receiving results all steps should be made to follow up the test results and have a treating clinician inform the patient. This can be aided by:

- Documenting all investigations undertaken in the patient record
- Following up the investigation (eg the CIN checking an x-ray for deformity or reviewing results, where time permits)
- Informing a treating clinician if a patient has left and confirming that they will follow this up (and documenting)
- Informing the patient if they decide to leave about the risks of leaving and the process to follow up results (the CIN brochure will aid in this).

► **Red Flags**

- Patients who DNW and have not been seen by the CIN
- Patients who are deemed at risk to themselves leaving without being seen
- Unaccompanied mental health patients
- Children at risk.

Key Points

- The waiting room can be a challenging environment
 - Proactive management of the waiting room provides benefits for patients, carers and ED staff, reducing anxiety and aggression, initiating care and improving patient flow
 - Re-assessment of patients in waiting rooms improves clinical safety in EDs
 - Documentation of assessments and care in the waiting room reduces duplication of patient care.
-

Activity – CIN Participant Manual

Complete Activity 1 & 2 in Section 1.3 of the CIN Participant Manual

Activity 3 can be completed in partnership with the facilitator, or at the CIN face to face learning session.

Further Resources/Reading/References

Studer, Q. (2003) Hardwiring excellence. Fire Starter Publishing, Florida

DETECT manual, 2009 – Detecting Deterioration, Evaluation, Treatment, Escalation and Communicating in Teams

Recognition and management of the deteriorating patient technical discussion paper – QLD health – 2009

Management of pain and bleeding in early pregnancy – SSW_PD2008_017K

1.4 Pain and Overview of CIN Pharmacology

Statement of Purpose

The aim of this module is to:

- Provide an understanding of pain assessment and the physiological and behavioural indicators related to pain and pain assessment
- Emphasise the importance of providing early assessment of pain and appropriate pain relief strategies
- Provide the emergency nurse with an overview of commonly used pharmacological agents used in the treatment of pain and other common presenting problems
- Provide an overview of the medico-legal requirements for nurses using standing orders.

Learning Outcomes

At the completion of this module the CIN will be able to:

- Describe current knowledge relating to the anatomy and physiology of pain
- Contrast the differences between acute, chronic, somatic, visceral and neuropathic pain
- Identify the essential components of a pain assessment and taking a pain history
- Analyse the application of commonly used and validated pain assessment tools available for scoring pain
- Identify the challenges to managing pain in specific population groups (ie children, elderly and people from ethnic minority groups)
- Identify the differences between the terms addiction, tolerance and physical dependence
- Identify the appropriate pharmacological agents available and their indication according to the pain assessment
- Outline the vital role of re-assessment of patient's pain in the waiting room
- Discuss the role/options of non-pharmacological pain management in the ED
- Identify the medico legal responsibilities in relation to nurse initiated analgesia in the waiting patient
- For the listed medications identify key indications, contraindications and side effects
- Identify the barriers to effective pain management for the patient presenting with chronic pain.

Background

Pain is the most common symptom reported by patients who present to the ED, with evidence showing that more than 60% patients report pain on arrival to the ED (Lord & Ramsden, 2007). Many of these patients will self-medicate for pain before arriving. Early assessment of pain and timely access to analgesia is one of the major objectives to good emergency care. A primary goal for the Clinical Initiatives Nurse (CIN) is the aim to reduce the time patients wait in pain through the provision of early analgesia and reassurance. An appropriately qualified emergency nurse may achieve this through the nursing assessment and the instigation of early management strategies according to approved local guidelines and standing orders.

Part 1 Pain Pathophysiology and Assessment

Definition of Pain

Pain is defined by the International Association for the Study of Pain (IASP) as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage' (Mersky & Bogduk, 1994). The experience of pain is subjective and personalised for each individual and evidence shows it is often poorly recognised, poorly assessed and inappropriately treated (Macintyre et al, 2010).

Due to its subjective nature, pain is whatever the experiencing person says it is and it is as severe as the patient reports. Pain is an experience that often cannot be fully communicated to others and the inability to communicate verbally does not negate the possibility that the person is in pain and requires suitable pain relieving treatment (Macintyre et al, 2010).

Pain Receptors and Pathways

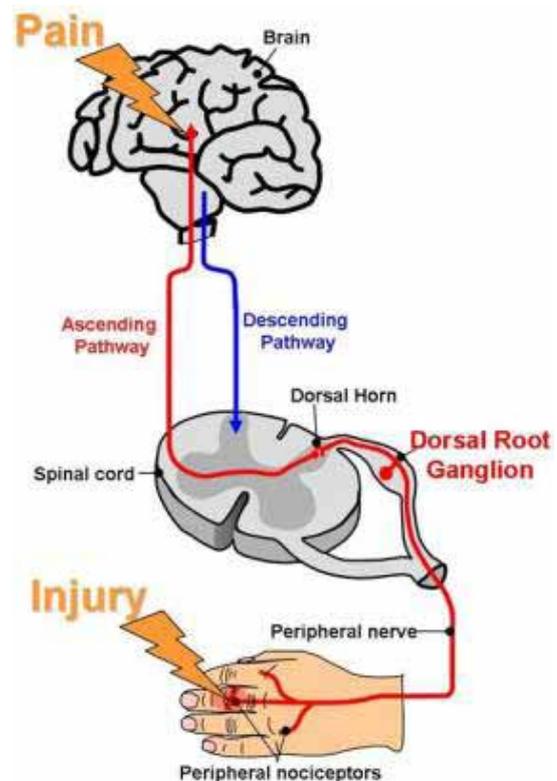
The pain experience involves a stimulus, which initiates electrical impulses within the central, peripheral and autonomic nervous system. These impulses are then interpreted or perceived by the individual and result in a response. This individual response varies due to the individual's pain tolerance and threshold for pain.

A nociceptor is a sensory receptor that responds to potentially damaging stimuli by sending nerve signals to the spinal cord and brain. This process called nociception causes the perception of pain. Nociceptors are nerve endings found in nearly every tissue of the body, including the skin, periosteum, joints, muscle and viscera (Lord & Ramsden, 2007). These nerves are sensitive to noxious stimuli, which may be thermal, chemical or mechanical in nature.

There are two major types of nociceptors, the small myelinated A delta fibres and larger unmyelinated C fibres. The A-delta fibres are stimulated by heat and noxious mechanical injury and conduct impulses at a very rapid rate. They are responsible for transmitting acute sharp pain that follows an injury. The C-fibres transmit sensory input at a slower rate and are responsible for the throbbing slowly building and sometimes burning pain that follows the initial injury. The C-fibres are known to produce chronic types of pain (Lord & Ramsden, 2007). The pathways ascend from the dorsal horn in the spinal cord to the thalamus and other centres in the brain (see Figure 1).

For more information on pain pathophysiology, consult a relevant text.

Figure 1 Pain Pathways



http://www.icagen.com/media/images/rd_pain2.jpg

Acute Pain

Pain may be defined as either acute or chronic. Acute pain is of recent onset, the cause is usually known and often reversible lasting for a short period of time (usually less than 1 month). It is often associated with anxiety and hyperactivity of the sympathetic nervous system, resulting in tachycardia, increased respiratory rate and blood pressure, diaphoresis, and dilated pupils (Macintyre et al, 2010). Pain is usually transitory, lasting only until the noxious stimulus is removed or the underlying damage or pathology has healed, but some painful conditions, such as rheumatoid arthritis, peripheral neuropathy, cancer and idiopathic pain, may persist for years.

Chronic Pain

Chronic pain is a phenomenon that is difficult to define but is experienced by many in the community, including a large proportion of the elderly population. Chronic pain differs from acute pain in that it typically persists for longer than expected after illness or injury and there may be no clearly identifiable cause (Macintyre et al, 2010). Chronic pain is pain that has persisted beyond the normal tissue healing time, it may be persistent or intermittent in nature, and it is known to be more difficult to manage or control than acute pain (McCance & Huether, 2002). It is common for patients to experience an acute exacerbation of chronic pain (Macintyre et al, 2010). Chronic pain is usually experienced on a daily basis, usually lasting from 3- 6months and may vary in pain intensity. The established categories of chronic pain can be simplified into 4 groups: musculoskeletal, neuropathic, headache and other (Dobkin & Boothroyd, 2006).

Patients presenting to the ED with chronic pain can present challenges for the CIN, as the expectations of the patient and staff have been shown to differ. Chronic pain sufferers have identified the following barriers to effective pain management:

- Stigma – they may be assumed to be drug seeking, impatient or demanding
- Loss of control of one's life, struggling with everyday life
- Not wanting to have to repeatedly seek medical help
- Frustration with the medical/clinical profession
- Lack of effective or adequate diagnoses, cures and medicines
- Perceived lack of credibility ie not being believed
- Depression and/or reduced happiness
- Perceived lack of empathy.

(Chronic Pain Australia, 2009)

Learning Activity 1

Complete Learning Activity 1 in the CIN Participant Manual.

Pain Assessment

The assessment and measurement of pain are fundamental to:

- diagnosis of the cause of a patient's pain
- selecting an appropriate analgesic therapy
- evaluating then modifying that therapy according to the patient's response.

Historically, patients attending EDs have had a poor assessment of their pain needs and suffered delayed administration of appropriate analgesia (Arendts & Fry 2006). A thorough assessment and documentation of the patient's pain and presenting complaint are of utmost importance in the process of nurse initiated analgesia. The elderly population and patients who are culturally and linguistically diverse may have little expectation for pain relief, and hold beliefs that pain should be endured. Thus they may tolerate higher levels of pain than advised by health care staff (Phelan, Higgins et al, 2009). This poses a direct challenge to the CIN, as they may be less likely to report their pain and request medications to relieve their pain.

History Taking

A complete pain history provides important diagnostic information that may help distinguish different underlying pain states such as nociceptive (somatic and visceral) or neuropathic pain. The patient's self-report of pain should be accepted as the most reliable indicator of pain severity (Lord & Ramsden, 2007). There are three main steps the emergency nurse should take to effectively assess and manage the patient's pain which include:

- 1) a general history,
- 2) specific pain history and
- 3) physical examination.

Avoid prompting the patient by asking leading questions and making inferences about their pain.

The following mnemonic can assist with the assessment of pain:

P	Provoked	What provoked the pain and what makes it worse? Did the pain occur during exercise or at rest (unprovoked)? Does anything change the intensity of the pain ie deep inspiration or movement?
Q	Quality	How does the patient describe the pain? ie sharp, dull, crushing, burning, shooting, cramping.
R	Region, Radiation, Relief	Ask the patient to describe the region affected by the pain and what makes it better or worse?
S	Severity	Ask patient to rate their pain on a validated pain scale.
T	Time of Onset & Duration	Ask the patient when the pain commenced and how long it has been there for? Is the pain constant or coming and going? Patients may have self administered analgesics or received analgesia from paramedics. Drug, dose and time of last administration are important.

Pain Measurement

Pain is an individual and subjective experience modulated by physiological, psychological and environmental factors such as previous events, culture, prognosis, coping strategies, fear and anxiety. Most measures of pain are based on self-report. In some instances it may not be possible to obtain reliable self-reports of pain. Examples of patients in whom this may occur include:

- Impaired consciousness
- Cognitive impairment
- Young children and the elderly
- Language difficulties
- Inability to understand the measures
- Unwillingness to cooperate
- Severe anxiety.

In these circumstances other methods of pain assessment will be needed (Macintyre et al, 2010).

Recording pain intensity as 'the fifth vital sign' aims to increase the awareness and utilisation of pain assessment and may lead to improved acute pain management. Regular and repeated measurements of pain should be made to assess ongoing adequacy of analgesic therapy.

The appropriate frequency of reassessment will be determined by:

- the duration and severity of the pain
- patient needs and response
- the type and route of drug delivery
- the nature of the specific intervention (eg ice/splinting).

As a minimum pain status should be evaluated prior to any analgesic administration and at least within one hour following administration and/or according to your local hospital protocols.

When assessing a patient's pain it is not up to the patient to 'prove' they have pain. A more evidence based approach is to presume that a patient is in pain and treat the pain, rather than to deny someone adequate analgesia.

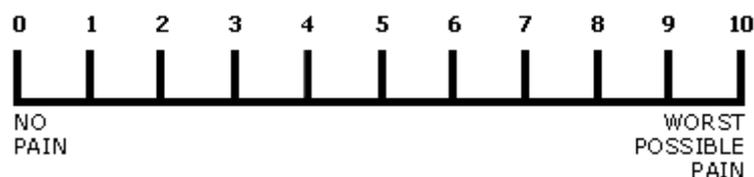
In assessing a child's pain, use of a measuring tool must take into account a child's age, cognitive level, type of pain, and the situation in which the pain is occurring. No single measure is useful for all children with all types of pain. However, it should be possible to have a practical, valid, and reliable measure to evaluate a child's pain for any particular setting. The most reliable method of pain measurement is self-report and children as young as 3 years have been shown reliably to self-report pain intensity with the correct use of appropriate assessment tools.

Suitable pain severity scales for use in emergency settings include a numerical rating scale (NRS) or visual analogue scale (VAS) and the Verbal Numerical Rating Scales (VNRS). For children the Wong-Baker FACES Rating Scale or the Faces Pain Scale-Revised (FPS-R) can be used, and for infants the FLACC Behavioural Pain Scale is useful. The Abbey Pain Scale is recommended for elderly patients with severe confusion.

Numerical Rating Scale

Numerical rating scales have both written and verbal forms. Patients rate their pain intensity on the scale of 0 to 10 where 0 represents 'no pain' and 10 represents 'worst pain imaginable', or their degree of pain relief from 0 representing 'no relief' to 10 representing 'complete relief' (Macintyre et al, 2010) (Figure 1.1).

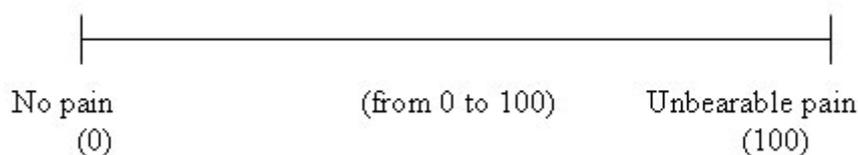
Figure 1.1 Numerical Rating Scale (NRS)



Visual Analogue Scale

Visual Analogue Scales (VAS) consists of a 100 mm horizontal line with verbal anchors at both ends and no tick marks. The patient is asked to mark the line and the 'score' is the distance in millimeters from the left side of the scale to the mark. VAS ratings of greater than 70mm are indicative of 'severe pain' and 0-5mm 'no pain', 5-44 mm 'mild pain' and 45-74 'moderate pain' (Macintyre et al, 2010) (Figure 1.2).

Figure 1.2 Visual Analogue Scale (VAS)



These two scales require an understanding of seriation (the serial differences in smaller to larger) and are unsuitable for children less than 5 years. They may also be unsuitable in up to 26% of adult patients (Macintyre et al, 2010). In comparison, Verbal Numerical Rating Scales (VNRS) where patients are asked to imagine that 0 represents 'no pain' and 10 represents 'worst pain imaginable' are simple to administer to adults and older children, give consistent results and correlate well with the VAS (Macintyre et al, 2010).

Wong-Baker Faces Pain Scale

The Wong-Baker Faces Pain Scale is recommended for children as young as 3-8 years and consists of six cartoon face as ranging from smiling face for 'no pain' to tearful face for 'worst pain' (Figure 1.3).

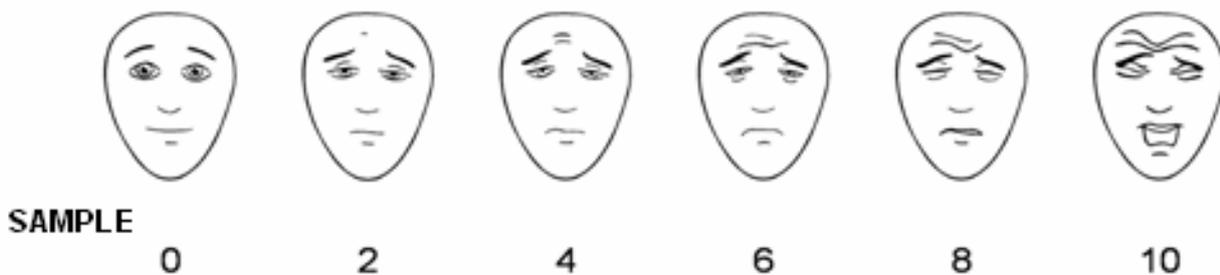
Figure 1.3



Faces Pain Scale – Revised (FPS-R)

The Faces Pain Scale - Revised (FPS-R) was adapted from the Faces Pain Scale in order to make it possible to score on the widely accepted 0-to-10 metric (Figure 1.4). It shows a close linear relationship with visual analogue pain scales across the age range 4 through 12 years. It is easy to administer the absence of smiles and tears in this faces scale may be advantageous in such cultures where these expressions are less acceptable or honorable. The FPS-R is recommended for use with (but not limited to) younger children. It may be used for older children or adults who experience difficulties with numerical scales (Figure 1.4).

Figure 1.4:



FLACC and Alder Hey Triage Pain Score (AHTPS) - Observational Pain Scales

The FLACC and Alder Hey Triage Pain Score (AHTPS) are observational scales, which require the clinician to assess certain behaviours and score them according to descriptors. Aagain they are scored from 0-10. The FLACC was designed for use with infants and pre-verbal children, due to their inability to self-report, and is based on evidence of reported pain behaviours (Willis, Merkel, Voepel-Lewis & Malviya, 2003).

The FLACC Behavioural Pain Scale is a simple and consistent tool to identify, document, and evaluate pain in infants and young children who have difficulty verbalising the presence or intensity of pain. This pain scale used in pre verbal children up to 2 years. Each of the five categories (F) face, (L) legs, (A) activity, (C) cry and (C) consolability is scored from 0-2 is for each category then added up to give a total score between 0 and 10 (Figure 1.5).

Figure 1.5

The FLACC Behavioural Pain Scale

Categories	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawan, disinterested	Frequent to constant frown, quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry, (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

Note: * Each of the five categories Face (F), Legs (L), Activity (A), Cry (C), and Consolability (C), is scored from 0-2, which results in a total score between 0 and 10.

Note: From Merkel, Voepel-Lewis, Shayevitz, and Malvviya (1997). The FLACC: A behavioral scale for scoring post operative pain in young children. *Pediatric Nursing*, 23(3), 293-297.

The AHTPS (Figure 1.6) was developed specifically to increase timeliness of assessment at triage (Stewart, Lancaster & Daly 2004).

Figure 1.6

The Alder Hey Triage Pain Score (AHTPS)

Categories	Scoring		
	0	1	2
Cry or Voice	No cry or complaint. Normal conversation	Consolable. Not talking or negative. Complains when asked.	Inconsolable > Complaining of pain without prompting
Facial Expression	Normal	Short Grimace < 50% of time	Long Grimace > 50% of time
Posture.	Normal	Touching/rubbing/sparing/limping	Defensive/tense. Non weight bearing.
Movement	Normal	Reduced	Immobile or thrashing
Colour	Normal	Pale	Very pale or 'green'

Stewart, Lancaster & Daly, 2004.

There are strengths and weaknesses to both types of scales revealed in the paediatric pain literature.

Interestingly, recent studies by Singer et al. (2002), and replicated in part in Australia by Rajasagaram et al (2009) found that clinicians scored pain significantly lower using observational scales in ED than the child who used a self report tool. However, when parents independently scored their child's pain, blinded to the child's score, they matched well. Parent's scores tended to be slightly lower, but not significantly different. It seems logical that parents know their child well and thus may be more alert to their child's pain behaviours.

Abbey Pain Scale

Assessment of pain in non-communicative patients is more difficult. Behaviours such as restlessness, frowning and grimacing, or sounds such as grunting or groaning are accurate measures of pain but not necessarily pain severity, especially in patients with advanced dementia (Macintyre et al, 2010). There are many observational pain assessment tools available and an example of this is the Abbey Pain Scale which has been developed for use in aged care facilities, and uses changes in behaviour to detect pain. This is best used in conjunction with a carer who knows the patient and their usual behaviours. (Figure 1.7)

Figure 1.7

Abbey Pain Scale **For measurement of pain in people with dementia who cannot verbalise**
How to use scale : While observing the resident, score questions 1 to 6.

Name of resident: _____

Name and designation of person completing the scale _____

Date: _____ Time: _____

Latest pain relief given was _____ at _____ hrs.

Q1	Vocalisation <i>eg whimpering, groaning, crying</i> Absent 0 Mild 1 Moderate 2 Severe 3	<input type="checkbox"/>
Q2	Facial expression <i>eg looking tense, frowning, grimacing, looking frightened</i> Absent 0 Mild 1 Moderate 2 Severe 3	<input type="checkbox"/>
Q3	Change in body language <i>eg fidgeting, rocking, guarding part of body, withdrawn</i> Absent 0 Mild 1 Moderate 2 Severe 3	<input type="checkbox"/>
Q4	Behavioural Change <i>eg increased confusion, refusing to eat, alteration in usual patterns</i> Absent 0 Mild 1 Moderate 2 Severe 3	<input type="checkbox"/>
Q5	Physiological change <i>eg temperature, pulse or blood pressure outside normal limits, perspiring, flushing or pallor</i> Absent 0 Mild 1 Moderate 2 Severe 3	<input type="checkbox"/>
Q6	Physical changes <i>eg skin tears, pressure areas, arthritis, contractures, previous injuries</i> Absent 0 Mild 1 Moderate 2 Severe 3	<input type="checkbox"/>

Add scores for 1-6 and record here: _____ **Total Pain Score**

Tick the box that matches the Total Pain Score	0 - 2 No Pain	3 - 7 Mild Pain	8 - 13 Moderate Pain	14 + Severe Pain
Finally, tick the box that matches the type of pain	Chronic	Acute	Acute on Chronic	

[http://www.dementia.unsw.edu.au/DCRCweb.nsf/resources/DCRC+Products+2/\\$file/11_Abbey_scale.pdf](http://www.dementia.unsw.edu.au/DCRCweb.nsf/resources/DCRC+Products+2/$file/11_Abbey_scale.pdf)
Jennifer Abbey, Neil Piller

Learning Activity 2

Complete Learning Activity 2 in the CIN Participant Manual.

Principles of Pain Management

Pain is best treated early and effectively because once established it is more difficult to treat. In addition there is increasing clinical evidence that appropriate early, aggressive management of acute pain may minimise the transition to chronic pain. It is also known that adverse physiological and psychological effects may result from unrelieved severe pain. Untreated severe pain can increase a patient's fears and anxiety leading to aggressive behaviour and have a detrimental effect on the patient's physiological parameters (Fry and Holdgate, 2002). An integrated multidisciplinary approach to pain management is often required for both acute and chronic pain.

The nurse's knowledge, attitudes, and perception influence the manner in which the patient's pain experience is evaluated and treated. Patients who are at particular risk for deficient analgesia (oligoanalgesia) are infants, children, the elderly, patients with emotional and mental illnesses, patients with chronic pain, patients who abuse substances, ethnic minority groups and those who are more seriously injured. Historically medical training and practice has supported withholding analgesia until a diagnosis has been reached. Fears that the analgesia will mask significant clinical signs and symptoms leading to a delayed diagnosis and treatment are partly behind this theory, however this is not supported by evidence (Macintyre et al, 2010).

Many people in our society, including health care professionals, have strong fears about the ability of narcotics to cause addiction. This concern in the health setting is largely unwarranted and counterproductive and leads to under-prescribing by doctors. Additionally nurses have been shown to administer less analgesia than prescribed. This has been linked to a misunderstanding of the terms addiction, tolerance and physical dependence, as well as an overestimation of the incidence of patients receiving opioids for pain management. In a large study involving almost 12,000 patients who received opioids, addiction was described in just four patients (0.03%) (Porter & Hershel, 1980).

Learning Activity 3.1

Complete Learning Activity 3.1 in the CIN Participant Manual.

Emergency Nurses have important responsibilities for the provision of early and effective analgesia for patients experiencing pain. The ability to initiate medications in the CIN role requires:

- Accreditation to administer a range of analgesics under standing orders
- Use of appropriate clinical judgement that is supported by knowledge of pain management practices and
- Local guidelines and standing orders that are authorised by ED Directors and Drug Committees.

Barriers to Effective Pain Management in the patient with Chronic Pain

The CIN needs to be mindful of the patient's perception of pain relief barriers and accommodate for these. They must be able to reassure the patient and their carer and be able to articulate what lies in and out of their scope of practice. During the nursing assessment, the following considerations should be taken into account when caring for patient experiencing chronic pain:

- Often a more in depth and lengthy assessment is required
- There may be a limited choice of treatment options for the CIN (in comparison to an acute pain presentations)
- Patients have normally tried many medications and/or exhausted their own options
- Patients may already be on strong pain medications
- Many clinicians have their own perception of the pain experience which can inhibit clear communication (be aware of attitudes of health care staff and knowledge regarding chronic pain)
- There are misconceptions about tolerance, addictions and the side effects of opioid medications
- Communicate clearly and be aware of the patient's frustrations
- Be aware of previous drug interactions, current medications, previously tried medications and their effectiveness and any side effects from these medications.

The development and use of patient management plans for patients who may be frequently representing with chronic pain has been shown to improve the care and outcomes for this patient group. CINs can play an important role in such management plans.

Learning Activity 3.2

Complete Learning Activity 3.2 in the CIN Participant Manual.

Non- Pharmacological Pain Relief

Non-pharmacological pain relief is any method used to relieve pain that does not involve taking medications. While there are medications that can control pain, there are also alternative pain relief methods that can be used alone or in conjunction with medication. "Attempting to alter the patients emotional state, from stress or fear to comfort or peace, is also a common feature of many of the following techniques" (Williams, 1996 in Macintyre, et al, 2010:227). Alternative/adjunctive techniques to consider for pain relief include:

- Therapeutic touch
- Acupressure
- Positioning
- Guided imagery
- Relaxation
- Heat or cold compresses
- Play therapy/distraction therapy
- General comfort measures
- Keeping patient informed and reassured
- RICE – Rest, Ice, Compression, Elevation.

The application of one or more of the above options can be effective in reducing the pain experience of individuals in some clinical situations (Macintyre, et al 2010).

Part 2 Pharmacological Pain Management

Drugs that act as analgesics are divided into three main groups: nonopioids, opioids and adjuvants. An opioid includes natural and synthetic compounds that bind to opioid receptors in the nervous system. Opiates bind to the opiate receptors to inhibit the transmission of pain impulses and alter pain perception. An adjuvant refers to drugs that have a primary indication other than pain but have analgesic effects in certain conditions (Lord & Ramsden, 2007). The following information contains examples of drugs in each category which are often utilised in the emergency setting. CIN's are advised to consult a specialist pharmacology reference (eg MIMS) and local agreed standing orders for advice regarding which drugs have been approved as standing orders as well as indications, dose, contraindications, adverse effects and preparation of these analgesics.

Key Points for Pharmacology Module

- This module gives an overview of the drugs commonly used in the CIN role
 - There may be drugs listed below that **are not** listed under local standing orders and conversely additional drugs may be endorsed at individual EDs which are not listed below
 - CINs must at all times comply with the endorsed Standing Orders for their individual hospitals and/or Local Health Networks and not act outside of this scope of practice.
-

▶ *Red Flags*

The inclusion of these 'red flag' icons ▶ is intended as a visual trigger to outline common considerations/contraindications with particular types of medications. It is not an exhaustive list and CINs must adhere to local guidelines when using standing orders.

Nonopioids

Nonopioids are commonly used for patients experiencing mild to moderate pain or used in combination with opioids for more severe pain. These include paracetamol and Non Steroidal Anti Inflammatory Drugs (NSAID's), such as Ibuprofen, which are the two most common simple analgesics and antipyretics CINs administer under approved standing orders.

PARACETAMOL

Paracetamol is a widely accepted simple analgesic which, when used in combination with other analgesics, can enhance the analgesic effect to relieve severe pain (ANZCAFPM, 2006). It is commonly used for mild to moderate acute pain and fevers above 38°C. The exact mechanism of action is not well known, however it is believed to produce analgesia by blocking pain impulses through its prostaglandin inhibitory effect on the central nervous system (Lord & Ramsden, 2007). Its antipyretic effect is also probably due to the reduced prostaglandin production in the hypothalamus. Paracetamol is rapidly absorbed via the gastrointestinal tract, with peak plasma levels at 10 - 60 minutes after administration (MIMS, 2010). Due to the low risk of side effects associated with paracetamol it can be used by patients who may not be able to take NSAIDs (due to allergy, history of asthma, or stomach ulcers etc).

Age Considerations

The appropriate dose of paracetamol depends on the patient's age, weight, pre-existing disease and concurrent medications. Paediatric patients (ie before puberty) can generally tolerate higher doses of paracetamol than adults due to increased clearance. Neonates (age < 1 month) have a similar elimination half life as adults. Very elderly patients should be prescribed reduced doses due to decreased clearance (NSW Health Policy Directive PD2006_04 Paracetamol Use).

Administration

Paracetamol can be administered by a variety of routes including; oral liquid suspension, oral tablets or capsules, effervescent tablets, intravenous and rectal. However via the rectal route, paracetamol is understood to be erratically absorbed and not usually recommended (NSW Health Policy Directive PD2006_04 Paracetamol Use).

▶ *Red Flags*

- Consideration must always be given to ensuring 'safe' dosage guidelines of paracetamol are followed
- Paracetamol is an ingredient in many medications including; Panadol, Panamax, Dymadon, Mersyndol, Tylenol, Pain Stop & Cold and Flu preparations
- Check with the patient, prior to administration as to whether they have taken any drugs containing paracetamol in the previous 4 -8 hours. NB: Panadol Extend lasts for 8 hours
- Use in caution in patients who drink alcohol regularly, have liver disease or are dehydrated
- The recommended dose in an obese child is based on lean body weight relative to the age and height of the child.

***Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 4

Complete Learning Activity 4 in the CIN Participant Manual.

Non Steroidal Anti-inflammatory Drugs (NSAID's)

NSAIDs have anti-inflammatory properties and aid in the relief of mild to moderate pain and/or fever.

They are often combined with other medications (opioids) to relieve severe pain (ANZCAFP, 2006).

These drugs act to inhibit prostaglandin synthesis by blocking cyclo-oxygenase (COX) production which reduces inflammatory pain, swelling and fever. Two main forms of NSAIDs include the COX-1 and COX-2 inhibitors and examples of these are listed below.

COX-1		COX-2	
• Aspirin	• Ketoprofen	• Celecoxib	
• Ibuprofen	• Ketorolac	• Lumiracoxib	
• Indomethacin	• Naproxen	• Meloxicam	
• Diclofenac		• Parecoxib	

NSAIDs have significant side effects (peptic ulceration; effects on renal and platelet function) which are associated with long-term use. The selective COX-2 inhibitors are less likely to cause the gastrointestinal adverse effects which are associated with COX-1 drugs.

IBUPROFEN

Ibuprofen is a commonly used analgesic and antipyretic administered by CIN's under approved standing orders. Ibuprofen is absorbed via the gastrointestinal tract, with peak plasma levels at 60-120 minutes after administration (MIMS, 2010).

Age Considerations

The appropriate dose of NSAIDs depends on the patient's age, weight, pre-existing disease and concurrent medications. Caution should be used in elderly patients due to the renal effects and decreased clearance.

Administration

NSAIDs can be administered by a variety of routes including; oral liquid suspension, oral tablet or capsule and rectally as a suppository. Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on these drugs.

▶ Red Flags

- Check with the patient as to whether they are regularly taking an NSAID
 - Check with the patient as to whether they have had NSAIDs in the previous 6 hours
 - DO Not administer to patients with the following:
 - Medications - Anticoagulants (warfarin), ACE inhibitors, beta-blockers etc (refer to MIMMS)
 - Medical History - GI bleed, sensitive asthma or pregnant patients (3rd trimester)
 - A known hypersensitivity to NSAIDs
 - Use caution in patients with a history of asthma, hypertension, cardiac, renal or hepatic impairment, elderly > 65 years, pregnancy (1st & 2nd trimester) or the dehydrated patient
 - If using in combination with paracetamol for children, consider the child's hydration level prior to administration.
- *Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 5

Complete Learning Activity 5 in the CIN Participant Manual.

Opioids

Opioids are an excellent analgesic for severe acute pain and remain the mainstay for systemic analgesia treatment of moderate to severe pain (Macintyre, et al 2010). The effective use of an opioid involves the titration of the dose against pain, whilst observing the patient for side effects. Opioid analgesics are divided into two categories: mu (μ) and kappa (κ) agonists and antagonists, with the mu agonists (morphine-like) being the largest and more often used group (Lord & Ramsden, 2007). Some examples of opioid drugs used within the emergency setting include Codeine, Oxycodone, Morphine, Fentanyl, Methadone, Hydromorphone, Tramadol and Buprenorphine.

Age Considerations

The appropriate dose of Opioids depends on the patient's age, weight, pre-existing disease and concurrent medications. Caution should be used in elderly patients due to decreased clearance.

Administration

Administration may be by a variety of modes including; intravenous, intramuscular, subcutaneous injection, oral liquid suspension, oral tablets or capsules and inhalations. Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on administration of these drugs.

CODEINE

Codeine is a weak opioid that is metabolised to morphine to provide an analgesic effect. It is understood to act on the CNS by binding to the opiate receptors and inhibiting the transmission of the pain impulse. However up to 10% of the Caucasian population lack the enzyme responsible for this conversion process. Therefore this drug may be ineffective in these individuals (Lord & Ramsden, 2007). The combination of a simple analgesic (paracetamol or aspirin) with a mild opioid (codeine) is often used for moderate pain. Examples of drugs which may be administered by the CIN under an approved standing order include Paracetamol 500mg and Codeine 30mg (Panadeine Forte®, Painstop Daytime and Codalgin Forte), Aspalgin and Codeine Linctus.

OXYCODONE

Oxycodone is a semi synthetic narcotic analgesic with multiple actions similar to those of morphine. It is an opioid agonist and binds to receptors in the central nervous system (CNS) to produce analgesia with some associated sedation. Oral administration of Oxycodone (Endone) tablets has a peak analgesic effect at 30 - 60 minutes and persists for three to six hours (MIMS, 2010).

MORPHINE

Morphine is an opioid analgesic which, under an approved standing order, may be administered by CIN's for moderate to severe pain. Morphine acts as an agonist, binding to receptors in the brain, spinal cord (CNS) and other tissues (smooth muscle) inhibiting the transmission of the pain impulse (Lord & Ramsden 2007). Morphine administered intravenously has a peak analgesic effect at 20 mins after administration (MIMS, 2010).

Learning Activity 6.1

Complete Learning Activity 6.1 in the CIN Participant Manual.

▶ **Red Flags (Opioids)**

- Check with the patient as to whether they are regularly taking an Opioid
- Check with the patient as to whether they have had Opioids in the previous 4 hours
- DO Not administer to patients with the following:
 - Haemodynamically unstable
 - Head injury and/or altered level of consciousness
 - Intoxicated or confused
 - Sensitivity or allergy to Opioids
 - Taking drugs to treat opiate dependence ie methadone, buprenorphine.
- Use with caution in patients with a history of:
 - Renal or hepatic impairment
 - Elderly or debilitated (reduced dosages)
 - Breastfeeding mothers.

***Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 6.2

Complete Learning Activity 6.2 in the CIN Participant Manual.

Inhalation Analgesics

Adjunctive analgesics are medications which are used in combination with opioid, NSAIDs or paracetamol to enhance pain relief or treat symptoms that exacerbate pain. Nitrous Oxide (NO) is classified as an adjuvant drug, and is commonly used in anaesthesia. It is a mild analgesic and sedative when given with oxygen in a 50:50 mix (Entonox) (Lord & Ramsden, 2007). Examples of inhalation analgesics used as adjuncts (for short time frames) for moderate to severe pain, under an approved standing order, include Entonox, Nitrous Oxide (NO) and Methoxyflurane. Nitrous Oxide (NO) is a suitable analgesia/anticholinergic agent which aids in short painful procedures. Methoxyflurane, used in low concentrations, is an effective analgesia agent and is used in hospital and pre-hospital settings (Macintyre et al, 2010).

Age Considerations

The appropriate dose of inhalation depends on the patient's age, weight, pre-existing disease and concurrent medications. Caution should be used in young children and the elderly.

Administration

Administration is achieved by self administration through inhalation under direct supervision (and assisted as necessary) by accredited staff. Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on administration of each of these drugs.

▶ **Red Flags**

- Patients may be required to fast for procedural sedation with Nitrous Oxide (refer to your local policies).
- Patients and staff may experience adverse effects after a long-term exposure to Nitrous Oxide if scavenging systems are not used effectively.
- Methoxyflurane is potentially nephrotoxic and hepatotoxic especially when the safe weekly dose (15mLs) has been exceeded.
- Use caution in patients with a history of:
 - Renal or liver impairment
 - Diabetes
 - Malignant hyperthermia
 - Elderly patients.

***Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 7

Complete Learning Activity 7 in the CIN Participant Manual.

Anaesthetic Agents (Topical)

Local anaesthetic agents reduce or prevent pain without affecting consciousness. Drugs that provide local anaesthesia are often used for minor procedures and pain relief. Local anaesthetic agents can be given via several routes. Topical application produces anaesthesia when applied to mucous membranes, conjunctiva and damaged skin (Lord & Ramsden, 2007). Some topical anaesthetic agents that are available with the emergency setting may include:

- Amethocaine 4% (AnGel cream)
- Laceraine™/ALA (Lignocaine HCL 4%, Amethocaine HCL 0.5% and 0.1% Adrenaline)
- EMLA™ (lignocaine & prilocaine)
- Amethocaine 0.5% eye drop preparation
- Xylocaine Viscous.

Age Considerations

The appropriate dose of these drugs depends on the patient's age, weight, general medical condition and concurrent medications. Caution should be used in young children and the elderly.

Administration

Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on administration of each of these drugs.

LACERAINE

Laceraine is a Topical Wound Anaesthetic is used to control local pain and bleeding in open wounds and thus aids in suturing or cleaning a wound. It is a mixture of two local anaesthetics (which reduce pain) and adrenaline, which constricts blood vessels and reduces the bleeding of the wound or laceration. Laceraine is used for analgesic purposes in wounds that are likely to require suturing for children >1 year of age. There are clear step by step directions in the standing order and/or product information sheet on how to administer this medication which must be followed.

AMETHOCAINE 0.5% EYE DROPS

Amethocaine Hydrochloride 0.5% is an ophthalmic anaesthetic agent which is used to produce local anaesthesia in the eye. It is commonly used to aid examination or irrigation of the eye for patients presenting with acute red eye, flash burns, chemical burns and foreign bodies and it also provides short term pain relief. Onset of anaesthesia after instillation into the eye is 10 to 20 seconds, and duration of anaesthesia is 10 to 20 minutes. Patients should be warned not to rub or touch the eye while anaesthesia persists. On instillation an initial burning sensation may be experienced and this may last for up to 30 seconds. Repeated administration may impede healing, thus the patient must not be discharged with this medication. This medication should not be administered if there is a risk the patient has a penetrating eye injury.

Anaesthetic Agents (Injectable)

Infiltration of anaesthetic agents involves subdermal and subcutaneous injections to produce an anaesthetic field around the injury or area to be prepared. The most common local anaesthetic agent utilised in EDs is Lignocaine 1% or Lignocaine 1% with Adrenaline. Lignocaine has a rapid onset and a medium duration of action. The onset of action is 1 to 5 minutes following infiltration and 5 to 15 minutes following other types of administration. (MIMS, 2010). Tolerance also varies with the status of the patient. Debilitated, elderly patients, acutely ill patients and children should be given reduced dosages commensurate with their age and physical status.

Injection should always be made slowly with frequent aspirations to avoid inadvertent intravascular injection, which can produce cerebral symptoms even at low doses. Careful and constant monitoring of cardiovascular and respiratory vital signs and the patient's state of consciousness should be accomplished after each local anaesthetic injection. It should be kept in mind that at such times restlessness, anxiety, tinnitus, dizziness, blurred vision, tremors, depression or drowsiness may be early warning signs of CNS toxicity (MIMS, 2010).

▶ Red Flags

- DO NOT use in the extremities such as the 5 P's:
 - Pinna of the ear
 - Penis
 - Distal tips of fingers [pinkies]
 - Proboscis [nose]
 - Periphery [other].
- With accidental intravascular injections, the toxic effect will be obvious within one to three minutes
- Maximum dose of Lignocaine 1% is 3mg/kg
- Maximum dose of Lignocaine 1% with Adrenaline is 7mg/kg.

***Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 8

Complete Learning Activity 8 in the CIN Participant Manual.

Part 3 Other Drug Pharmacology

Depending on the hospital or local health network there may be further medication standing orders which support the initiation of care in the CIN role. These may include but are not limited to the drugs discussed below. Nurses must be accredited under the standing order protocols to utilise these drugs. Refer to local guidelines/standing orders for further information.

Antiemetics

Antiemetics are used to treat nausea and/or vomiting to provide relief and prevent complications such as dehydration and electrolyte disturbances. The main factors influencing which anti-emetic may be administered by the CIN are:

- which drug has an approved standing order
- the cause of nausea and vomiting
- patient characteristics and current medications
- the severity of symptoms and
- route of administration (use rectal or parenteral route when the oral route cannot be used).

Antiemetics that are available with the emergency setting may include Metoclopramide (commonly first line therapy) or Prochlorperazine and Ondansetron (commonly second line therapy).

Age Considerations

The appropriate dose of these drugs depends on the patient's age, weight, general medical condition and concurrent medications. Caution should be used in elderly patients due to decreased renal and hepatic clearance. Caution to be used when administering to young adults/children and pregnant or lactating women.

Administration

Administration may be; intravenous, intramuscular, subcutaneous injection, oral tablets and wafers. Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on administration of each of these drugs.

METOCLOPRAMIDE (MAXALON)

Metoclopramide Hydrochloride (Maxalon) is considered a first line antiemetic therapy and is recommended for patients 20 years of age and over. It should be restricted in young adults and children due to the adverse reaction these patients may incur. The onset of pharmacological action is 1 to 3 minutes following an intravenous dose, 10 to 15 minutes following intramuscular administration, and 30 to 60 minutes following an oral dose; pharmacological effects persist for one to two hours (MIMS, 2010). Rapid IV administration is associated with increase side effects, thus it should be administered slowly.

PROCHLORPERAZINE (STEMETIL)

Prochlorperazine is considered a second line antiemetic therapy for nausea and vomiting which is due to various causes including migraine, vertigo due to Meniere's syndrome and labyrinthitis. Stemetil is not recommended for use in children under 10 kg or aged less than 2 years, as acute extrapyramidal reactions are more likely to occur.

ONDANSETRON

Ondansetron hydrochloride dihydrate is considered a second line antiemetic therapy, and its precise mode of action in the control of nausea and vomiting is not known. It is commonly used for patients on chemotherapy and with post-operative nausea and vomiting. Ondansetron is a Category B1 drug and the safety of Ondansetron for use in human pregnancy has not been established. Lactating mothers should not breastfeed their babies whilst taking this medication (MIMS, 2010).

▶ **Red Flags**

- Dystonic reactions may occur in patients given Maxolon and Stemetil. These occur more frequently in children and young adults and may occur after a single dose
- DO NOT administer to patients who have a history of dystonic reactions
- DO NOT administer to patients taking Neuroleptic medications (phenothiazines)
- Pregnant patients and lactating mothers
- Use caution in elderly patient with hepatic and renal impairment
- Use caution in young adults and children.

***Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 9

Complete Learning Activity 9 in the CIN Participant Manual.

Immunisations

Immunisations that may be available for the CIN to administer under standing orders commonly includes those to prevent Tetanus caused by *Clostridium tetani*, a motile, non-capsulated, Gram-positive rod that forms endospores. Spores of the bacillus are found in manured soil and can enter wounds (Australian Immunisation Handbook, 2008).

DIPHTHERIA TOXOID AND TETANUS TOXOID (ADT BOOSTER)

This vaccination is for children 5 years of age and over and adults who have previously received at least three doses of a vaccine for primary immunisation against diphtheria and tetanus. The ADT Booster is not intended for primary immunisation against diphtheria and tetanus. Patients must fulfil the tetanus wound management guidelines (Australian Immunisation Handbook, 2008) and present with open wounds likely to contain *clostridium tetani* which may include:

- Compound fractures
- Bite wounds
- Deep penetrating wounds
- Wounds containing foreign bodies (ie wood splinters)
- Wounds with extensive tissue damage (ie contusions or burns)
- Superficial wounds contaminated with soil, dust or manure
- Re-implantation of avulsed tooth
- Wounds complicated by pyogenic infections.

Age Considerations

Administration should be in accordance with the recommendations in the Australian Immunisation Handbook and Immunisation Schedule; with the recommended Immunisation for age given.

Administration

Administration is achieved by an intramuscular injection into the deltoid muscle.

The vaccine should be thoroughly shaken before use to ensure adequate dispersion when it is injected. Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on administration of this drug.

Learning Activity 10

Complete Learning Activity 10 in the CIN Participant Manual.

Intravenous Fluids

Intravenous fluids are often administered in the emergency setting as an electrolyte replenisher for maintenance fluids or replacement of deficits of extracellular fluid in patients who are unwell. The CIN may be able to initiate Sodium Chloride 0.9% under a standing order for specific patient groups.

SODIUM CHLORIDE 0.9% (NORMAL SALINE)

Sodium is the major cation of extracellular fluid and functions principally in the control of water distribution, fluid and electrolyte balance and osmotic pressure of body fluids. Chloride assists the sodium cation in the maintenance of acid/base balance, isotonicity and electrodynamic characteristics of the cells. Normal Saline (Sodium Chlorides 0.9%) given as an intravenous infusion, is a source of water and electrolytes. It is used in the ED setting to promote rehydration or prevent dehydration. Excessive amounts of sodium chloride may cause hypokalaemia and acidosis. Correct use of Sodium Chloride 0.9% (Normal Saline) as a vehicle for parenteral drugs or as an electrolyte replacement therapy is unlikely to result in adverse effects (MIMS, 2010).

Age Considerations

The appropriate dose of this fluid depends on the patient's age, weight and general medical condition.

The dosage of Sodium Chloride 0.9% (Normal Saline) as an electrolyte replenisher must be calculated after consideration of clinical and laboratory data, and for the CIN must be guided by standing orders. Caution should be used in elderly patients due to decreased renal function. Caution to be used when administering to young children.

Administration

Administration is achieved by through intravenous infusion at a rate determined by local standing orders and guidelines.

Red Flags

- DO NOT exceed intravenous fluid resuscitation dose of 20mL/kg
- Use caution in patients with acute shortness of breath
- Use caution in elderly patients with hepatic and renal failure
- Use caution in patients on daily fluid restrictions
- Observe for signs of fluid overload
- Monitor effect of intravenous fluids using a strict fluid balance chart

****Refer to local Standing Orders for Indications and Contraindications***

Learning Activity 11

Complete Learning Activity 11 in the CIN Participant Manual.

Inhalation Bronchodilators

Inhalation medications are commonly used in the ED to assist patients in the relief of acute shortness of breath and bronchospasm. The most commonly used is Salbutamol, which is used in the treatment of bronchospasm, in asthma or chronic obstructive pulmonary disease (COPD). The Asthma Management Handbook (2006) is a good resource which can be utilised to guide practice and to refer to for further information.

Age Considerations

Use a valved spacer for adults and older children, a spacer with an attached face-mask or mouthpiece for children aged 2–4 years and a large-volume spacer for children aged 5 years and over.

Administration

Inhalation is the preferred method of delivery via a pressurised metered-dose inhaler (MDI), breath activated inhaler or dry-powder inhaler (DPI). The onset of action is faster with inhalation and there are fewer adverse effects compared to other delivery methods. Delivery via an inhaler plus a spacer is as effective as nebulised therapy, with less time to deliver a dose and reduced equipment maintenance (Asthma Management Handbook, 2006). Refer to your local standing orders, Product Information Sheets and/or MIMS Online for further information on administration of this drug.

SALBUTAMOL

Salbutamol is a short acting relatively selective beta2-adrenoreceptor stimulant used for treatment and relief of bronchospasm in patients with asthma or chronic obstructive pulmonary disease. Short-acting beta2 agonists (SABAs) such as Salbutamol relax bronchial smooth muscle by stimulating beta2-receptors, primarily in the airways, skeletal muscle and, to a lesser extent, the heart (this is especially important at higher doses). This accounts for the common side effects such as tachycardia and tremor (Asthma Management Handbook, 2006).

IPRATROPIUM BROMIDE

Ipratropium bromide is an inhaled anticholinergic bronchodilator with a slower onset of action (30 to 60 minutes) than other relievers. Its major role is in the treatment of chronic obstructive pulmonary disease (COPD). Ipratropium bromide has a limited place in the day to today management of asthma, although for children the addition of Ipratropium bromide to a SABA has shown benefit in the initial management of moderate and severe acute asthma. Administration by MDI and spacer is preferable to nebuliser therapy wherever possible (Asthma Management Handbook, 2006).

▶ Red Flags

- Assess patient's vital signs and auscultate the chest, if patient is hypoxic or meets 'severe' asthma criteria, patient requires **immediate medical review**
- Obtain spirometry or peak flow prior to bronchodilator administration where possible
- If patient unable to perform spirometry due to respiratory distress, patient requires **immediate medical review**
- Use caution in patients known to have hepatic or renal impairment
- Beware of the silent chest as this may indicate severe hypoxia
- Beware of patients who have required previous ED presentations or admissions to intensive care for their asthma or COPD.

***Refer to local Standing Orders for Indications and Contraindications.**

Learning Activity 12

Complete Learning Activity 12 in the CIN Participant Manual.

Part 4 Medico Legal Responsibilities

There are medico-legal requirements that accompany the administration of medications under standing orders. Implementing the Standing Orders for Nurse Initiated Analgesia (NIA's) according to individual site's guidelines is mandatory. Adherence to the NSW Department of Health (DOH) Policy Directive on "Medication Handling in NSW Public Hospitals" is an essential component of the CIN role, to ensure that a high standard of nursing practice and patient safety occurs.

When administering any pharmacological agent according to a Standing Order the nurse must always:

- Gather a thorough patient history and assessment, including a pain assessment (using an appropriate pain scale)
- Consider the analgesic options available, refer to the appropriate standing orders in relation to the patients pain score, and consider the indications and contraindications
- Clearly record the drug on the medication chart in the "Once only, Pre-medication and Nurse Initiated Medications" section
- Ensure the drug given, dosage and time administered are documented on the medication chart
- Record the drug legally, with the signature of the administering nurse, followed by a clearly PRINTED surname with NI (Nurse Initiator) following name as per NSW medication chart prompt
- The drug order must be co-signed by a Medical officer (MO) within 4 to 24hours from the time of administration (or as determined by your local policy)
- It is the responsibility of the nurse initiating treatment, to ensure that the MO co-signs this order as soon as possible
- Include the process of patient review and reassessment of pain score following the drug administration to establish the effectiveness of treatment
- If analgesia is inadequate and further medication is required outside the scope of the standing orders, the CIN will need to escalate the patient's care.

Monitoring and Compliance

Contemporary assessment and credentialing processes are to be applied when authorising a CIN to administer a drug according to a standing order. When implementing these standing orders according to the guidelines, the CIN is acting with the authorisation of Emergency Department Medical Director and the Hospital Drug Committee. Each hospital should have auditing processes in place for monitoring and auditing of compliance with standing orders, as well as processes in place if a disagreement occurs between the CIN and the treating medical officer as to the use of the standing order.

Learning Activity 13

Learning activity 13 is aimed at consolidating the knowledge gained in this module using case scenarios.

Complete Learning Activity 13 (Case Scenarios) in the CIN Participant Manual.

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- The CIN Education Pharmacological Module has some adaptations with the permission and consultation with the following CIN standing order learning packages and guidelines:
- Children's Hospital Westmead
 - Dubbo Base Hospital
 - John Hunter Hospital
 - Northern Beaches
 - St George Hospital.

1.5 Musculoskeletal Assessment of Limbs and Principles of Radiological Examination

Statement of Purpose

The aim of this module is to develop the Clinical Initiative Nurse's musculoskeletal assessment skills, their decision making regarding imaging and enable documentation of clinical findings through increased anatomical awareness.

Learning Outcomes

At the completion of this module the CIN will be able to:

- Demonstrate a standardised approach to history taking and physical assessment for the patient with a limb injury
- Recognise clinical or historical indicators of urgency (red flags) that require escalation in a patient with a limb injury
- Discuss appropriate first aid (including splinting), interventions, emergency treatment and pain management for the injury
- Identify radiology requirements according to assessment (using decision rules where available)
- Demonstrate competency in assessment of upper and lower limbs, including the specified joints
- Demonstrate competency in decision making regarding the ordering of radiological examination (dependent on local protocols)
- Demonstrate competency in documenting the assessment and any interventions that are commenced.

General Principles of Musculoskeletal Assessment & Initial Treatment

Isolated peripheral limb trauma is usually easily identified and often the patient's only complaint. However, the clinician should always suspect/consider the likelihood of other injuries. Identifying life threatening injuries always takes priority over limb threatening injuries. Multiple limb injuries should prompt the clinician to manage the patient as a major trauma case. In such cases, approach the patient within the principles of trauma assessment

Patient Assessment

All patients require an assessment which includes:

- mechanism of injury/history
- physical assessment
- pain assessment
- neurovascular assessment

Mechanism of Injury & History

It is important to ascertain how the patient injured themselves to help establish the type and extent of injury that may have been sustained. Questions about the nature and extent of the forces involved, and the body areas injured, will give valuable clues to the pattern of injuries. A clear history will also point to events that require investigation, such as an associated collapse.

Points to Consider

- Was it a simple trip and fall or the result of dizziness/syncope/chest pain
- Is there an associated head injury?
- The nature of the injury (twist/kick/inversion/eversion/hyperextension)
- Point of impact
- Presence of noises that accompanied the injury (snap or pop)
- Nature of associated swelling (immediate or over hours afterwards)
- Provoking factors (eg past medical history)
- Ability to weight bear immediately following the injury
- If there is no injury associated with the presentation – what is the presenting problem and history of that problem?
- Relevant past medical history including tetanus immunisation status
- Pain assessment including score.

**Where the mechanism of injury is uncertain or attributable to medical cause (eg collapse), medical investigation must take priority over the need for x-ray.*

Physical Assessment Elements in Musculoskeletal Assessment

Please note the traditional Orthopaedic approach to physical limb assessment is Look Feel Move. The sports medicine approach is Look, Move Feel. This section is written in the orthopaedic format; however the Limb Assessment DVD uses the sports medicine approach which can be practical in the Emergency Department setting.

Both approaches to assessment have merit. The CIN will be able to use either approach in the competency assessment.

The most important aspect is to recognise that the taking of a comprehensive history and the observation of the patient – (Look) will guide the approach to movement/feel.

Important features to remember before moving a limb are:

- **Movement should always be initiated by the patient in the first instance – not by the clinician**
- **Movement is contraindicated when the patient has obvious joint deformity or severe pain.**

Look

Compare the symmetry of the affected with the non- affected side.

Observe for swelling or obvious deformity or angulation.

Observe the colour of the limb or the presence of any bleeding, bruising, abrasions, lacerations or protruding bone.

Note if the patient is adopting a position of comfort or if there is any splinting by the patient.

Feel

Palpate above and below the site of injury for tenderness or crepitus.

Gently palpate the affected area to determine tenderness, the presence of crepitus and the neurovascular status of the limb.

Eliciting bony tenderness

The site/s of maximal bony tenderness should be elicited through careful physical examination. Tenderness of a bone when palpated from more than one direction helps differentiate true bony tenderness from that of overlying soft tissues.

Range of movement (ROM)

Range of movement may be limited by pain, weakness or deformity.

The CIN must be guided by the look and feel of the limb, and remembering the ROM that specifically applies to that joint. More detail is covered in each limb section. In most cases, an acutely painful swollen injured joint should not be assessed for range of movement until a bony injury has been excluded. Moving an acute fracture may disrupt the fracture and make the injury worse. Added to this, it is very painful and most patients won't tolerate this in the acute phase.

Assessing Neurovascular status

Indications of vascular compromise include; pain, pallor, cold extremity, slow capillary refill, numbness, paralysis or severe weakness and diminished or absent peripheral pulses.

Compression of peripheral nerves causes sensory disturbance +/- loss of motor function in the distribution of the peripheral nerve. This is unusual in the absence of gross clinical deformity but must always be assessed for.

Compartment syndrome is neurovascular compromise due to rising pressure in a fascial compartment and may complicate limb fractures. Severe pain is the hallmark sign. Symptoms can include the following:

- Pain out of proportion to apparent injury (early and common finding)
- Persistent deep ache or burning pain
- Parasthesia.

Examination findings can include the following:

- Pain with passive stretch of muscles in the affected compartment (early finding)
- Tense compartment with a firm "wood-like" feeling
- Pallor from vascular insufficiency (uncommon)
- Diminished sensation
- Muscle weakness
- Paralysis (late finding).

Key Points

- **Of the five classic signs (pain, pallor, pulselessness, parasthesia, paralysis), only pain is commonly associated with compartment syndrome, particularly in its early stages.**
Parasthesia may also occur. The most common area to develop compartment syndrome is a fracture to the tibia
 - Any neurovascular compromise must be diagnosed early and urgent management instituted.
The patient must be referred to a medical officer as a matter of urgency.
-

Splinting

Splinting of fractures reduces movement and pain as well as minimising the likelihood of exacerbating existing neurovascular damage.

Splinting options in the Emergency Department most commonly include Plaster of Paris slabs, slings or cardboard splints. Elevation of the injured limb (sling or pillow for upper limb or pillow for lower limb) helps to reduce swelling and pain. This is a simple and valuable intervention which should be performed on all limb injuries where possible.

Dressings

Dressings are only necessary for open injuries. If a compound fracture is suspected, the puncture site should be irrigated with sterile saline and a saline soaked combine applied. Irrigation of wounds with high-pressure saline (via a syringe and needle-irrigate don't inject) is an effective means of decontaminating very dirty wounds.

Urgent referral to medical staff is required if a compound injury is suspected.

Ring Removal

Rings on an injured limb should always be removed as soon as possible. Using lubricant or a ring cutter may be necessary. Ring removal may become difficult as swelling progresses and digital circulatory compromise is a possible consequence.

Analgesia

Patients with pain should be administered a suitable analgesic as per standing orders by an accredited CIN. Oral analgesia with a sip of water does not compromise fasting status. An ice pack may reduce pain and swelling. Pain should be managed as per local protocols, and prior to x-ray initiation.

Fasting

All patients with musculoskeletal injuries should remain fasted until reviewed by a doctor or Nurse Practitioner (NP) in case reduction or operative repair is required under sedation or general anaesthesia. Medication administered with a small amount of water is not generally contraindicated.

Amputated Digits, Tissues, or Limbs

In cases where the digit/tissue/limb has been completely amputated, the amputation should be wrapped in saline soaked gauze, placed in a clean bag, which is then placed in a bag with icy water. For partial amputations, a saline soaked dressing and bandage should be applied after a neurovascular exam has been performed. These patients have a time critical injury which requires prompt medical treatment.

*If an x-ray is ordered, notify the radiographer to include the amputated tissue within the parameters of the x-ray. This will help determine the degree of bone or tissue loss (if any).

Nurse Initiated X-rays

The initiation of limb x-rays by emergency nurses who have had formal training in musculoskeletal assessment and x-ray ordering, and are working to a departmental guideline, has become contemporary practice. Emergency Nurses have been shown to safely assess patients and ordered appropriate distal limb x-rays prior to medical or nurse practitioner assessment. In undertaking this practice emergency nurses are significantly contributing to the timeliness and effectiveness of assessment, diagnosis and treatment for ED patients.

Completion of this package will give emergency nurses the relevant training to undertake Nurse Initiated X-Ray (NIXR). However the nurse must be guided by local policies and guidelines, as acting outside of such guidelines is a breach of the scope of practice.

Fry, M. (2001) Triage nurses order x-rays for patients with isolated distal limb injuries: A 12-month ED study. Journal of Emergency Nursing 27:1

Documentation in the clinical record

Documentation in the medical record must include:

- Nurses name, signature and time of assessment
- Assessment performed including mechanism of injury and findings
- Interventions initiated
- Education/advice provided
- Plan of care
- Associated consultations/collaboration/ referrals (ie medical officer/NP/Others)
- Data entry for CIN.

Documentation on a Radiology Request Form

The form must be completed legibly and the identification of the person ordering the imaging must be clearly documented. Clinical information should include;

- A brief & specific description of the mechanism of injury
- An anatomical description of sites of maximal bony tenderness, swelling or deformity
- A provisional diagnosis (eg Fall onto extended R wrist, tender distal radius, ?# distal radius).

The examination requested should specify:

- The side of the injury (right or left)
- Specific views as indicated (eg scaphoid) (eg X-ray wrist or AP/lat wrist).

An accurate description of the mechanism of injury and the point of maximal bony tenderness is more important than a request for specific views. Radiographers use this information and their expertise to determine the most appropriate views for a particular injury pattern or site of tenderness.

Radiographers will image the joint above and below the injury site if you request imaging of a long bone.

Key Points

- There are patients who should be excluded from the Nurse Initiated X-ray process due to patient safety. Always refer to local protocols & guidelines
 - If there is any doubt or if further x-rays outside the scope of practice are likely to be required, this should be discussed with a medical officer prior to ordering the x-ray to avoid unnecessary further visits to radiology
 - Indications of neurovascular compromise include; pain, pallor, cold extremity, slow capillary refill, numbness and diminished or absent peripheral pulses and require urgent referral
 - A standardised approach to limb assessment is optimal
 - Removal of rings and analgesia is an important aspect of patient care
 - Pain and stabilisation (splinting) should be managed prior to x-ray.
-

Specific Limb Assessment, Principles of Investigation Ordering and Management

In each of the specific limb sections below there is:

- a) a brief overview of anatomy (for further detail consult an appropriate text book, CIAP resources, or a senior clinician)
- b) the principles of assessment
- c) reference to the appropriate module in the Limb Assessment DVD
- d) principles of x-ray ordering
- e) an activity to consolidate learning.

It is suggested the participant:

- read the resource manual
- review the anatomy using a text or online resource
- watch the relevant assessment on the DVD
- undertake the activity
- practise the skill with a colleague /facilitator
- undertake some clinical scenarios in partnership with the facilitator using the competency framework to gain experience in musculoskeletal assessment.

When ready the participant will complete the competency requirements for nurse initiated x-ray in accordance with local protocols/guidelines.

The Foot and Ankle

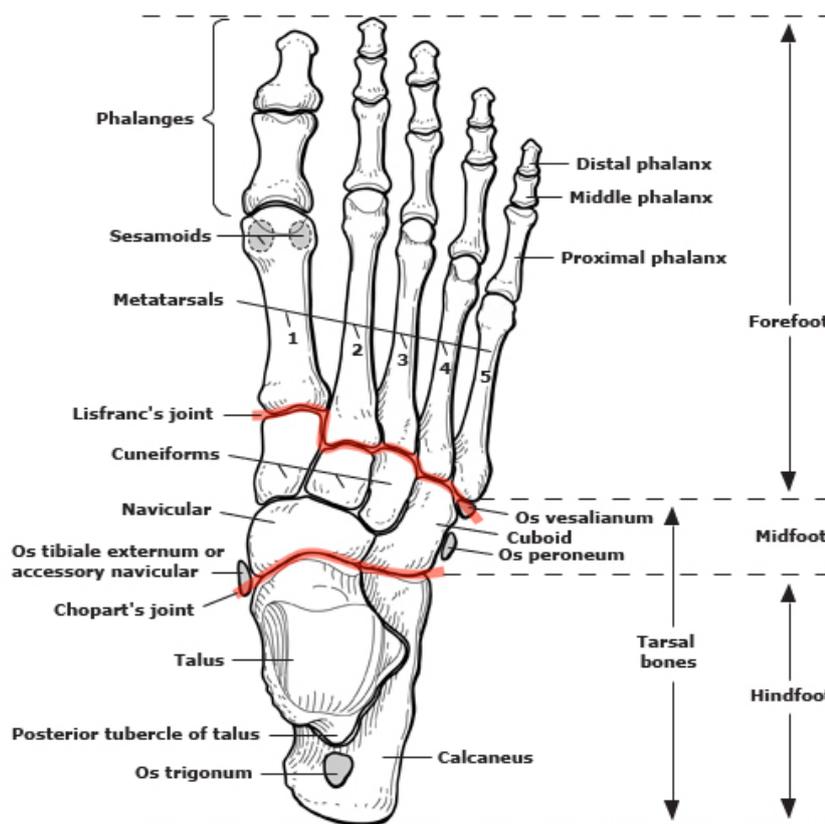
The foot and ankle consists of 28 Bones

Anatomy and physiology of the foot

The foot bones are generally described two ways – either by zones, or by grouping. The zones are the hindfoot, the midfoot, and the forefoot.

The tarsal bones lie in the hindfoot and are comprised of the calcaneus and the talus. The midfoot is comprised of 5 bones; the cuboid, the navicular, and the three cuneiform bones. The forefoot contains the metatarsals and the digits (toes). (Figure 1)

Figure 1 Foot anatomy superior view



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Anatomy and physiology of the ankle

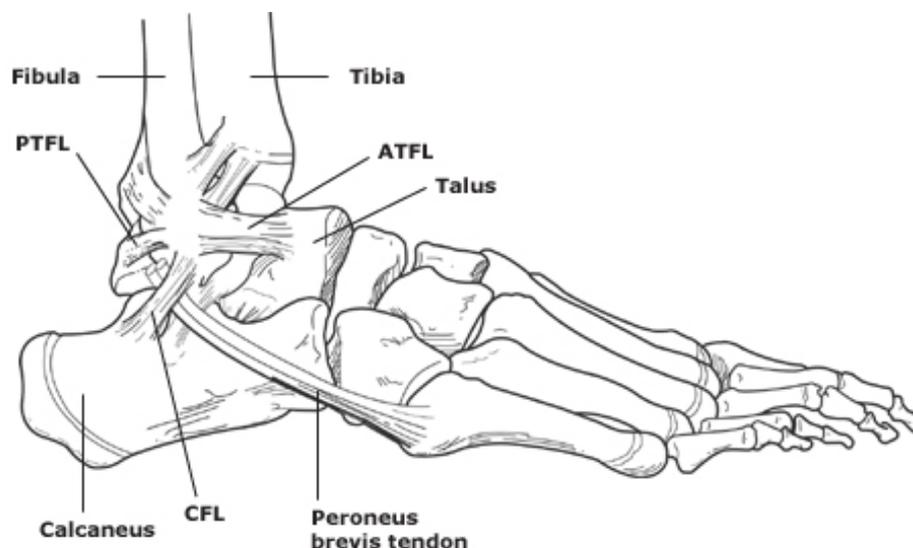
The ankle bones are made up of the lateral (distal fibula) and medial (distal tibia) malleoli.

There are 3 main lateral ligaments to the ankle: (Figure 2)

- ATFL – anterior talofibular ligament
- CFL – calcaneofibular ligament
- PTFL - posterior talofibular ligament.

The anterior talofibular ligament is the most vital of these as it provides ankle joint stability and is the ligament which is injured most during inversion injuries.

Figure 2 Lateral ankle ligaments



ATFL: anterior talofibular ligament; PTFL: posterior talofibular ligament; CFL: calcaneofibular ligament. ©2010 UpToDate® Accessed 15/12/2010

The medial ligaments are called the Deltoid ligament and comprise of the

- Tibiotalar
- Tibiocalcaneal
- Tibionavicular ligaments.

The deltoid ligament is stronger and less prone to injury than the lateral ligaments. As a result it provides the majority of ankle stability. An injury to the deltoid ligament usually carries greater significance for severity.

The main tendons associated with the foot and ankles are the:

- Achilles
- Peroneus Longus and Peroneus Brevis
- Tibialis Anterior and Tibialis Posterior.

Collectively these tendons permit the 4 main movements of the foot and ankle:

- Dorsiflexion
- Plantarflexion
- Inversion
- Eversion.

Foot and ankle assessment

The 5 most important bones to consider for injury are:

- Lateral Malleolus
- Medial Malleolus
- Navicular
- Base of 5th Metatarsal
- Calcaneum.

Common mechanisms of injury – foot

- Most foot fractures result from forces applied to the phalanges and metatarsals.
- Fracture of the base of the 5th metatarsal is most commonly an avulsion injury resulting from forceful inversion.
- Navicular fracture is often due to forceful adduction or abduction or maybe the result of an avulsion injury.
- Talar fractures result from falls or forced dorsiflexion of the foot (eg MVA).
- A tarso-metatarsal fracture-dislocation (aka Lisfranc's fracture) may result from a fall or crush injury of the foot.
- Calcaneal fractures are classically due to falls from a considerable height landing on the heels. The injury is commonly bilateral and associated with forearm and lumbar fractures.

Specific neurovascular risks

- Gross deformity of the foot is generally required to produce neurovascular compromise.
- Crushed feet occasionally develop a compartment syndrome.
- 2-3% of patients have congenitally absent dorsalis pedis pulses.

Common mechanisms of injury – ankle

- The ankle joint is comparatively unstable and endures great forces during falls and sporting pursuits.
- Most injuries result from extremes of inversion and eversion and most are ligamentous rather than bony.

Specific neurovascular risks

- Gross deformity from a fracture/dislocation of the ankle is usually required to create neurovascular compromise. Of great concern in this circumstance is the tension placed on the skin, which can lead to ischaemic necrosis.

Physical assessment

1. Look: Observe for swelling, inflammation, deformity, and skin changes. Compare with unaffected side. Is the patient weight bearing?
2. Feel: Localised bony tenderness; fibula head, medial/lateral malleoli, base 5th metatarsal, calcaneum. Check pulses and sensation and note any deficit
3. Note degree of movement within patient's pain limits
4. Undertake a pain assessment.

Activity 1

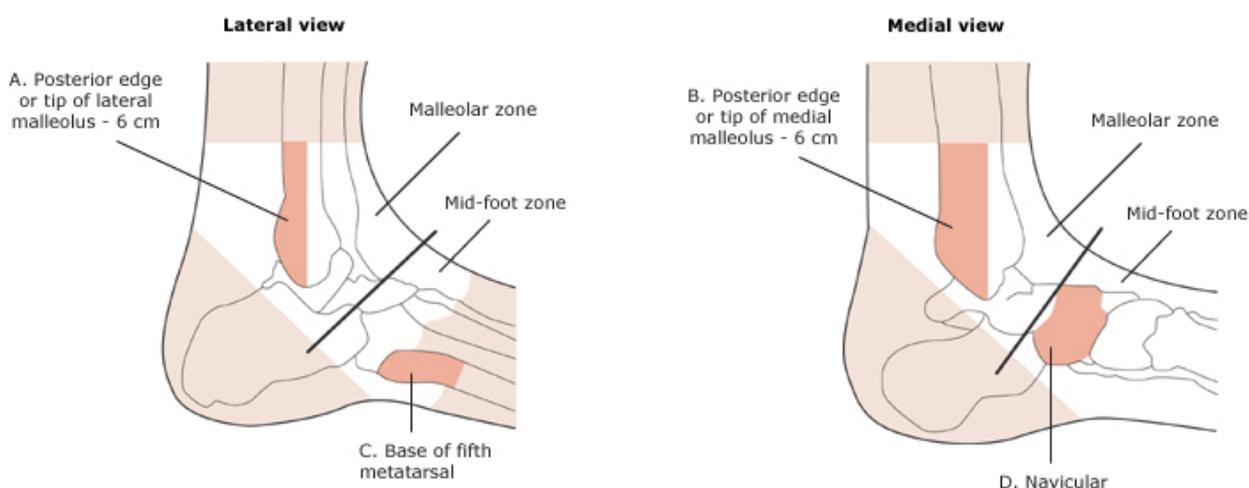
Refer to the participant manual and complete Learning Activity 1.

Robertson G.S., Ristic C.D., Bullen B.R., (1990). "The incidence of congenitally absent foot pulses". Annals of the Royal College of Surgeons of England 72 (2): 99–100. PMID 2185683.

Ottawa Foot and Ankle Rules

The Ottawa rules are evidence based guidelines which have been shown to accurately define the requirement for an x-ray in foot and ankle injuries. Ottawa Ankle Rules

Figure 3 Ottawa Foot and Ankle Rules



Ankle films: A series of ankle x-ray films is required only if there is any pain in malleolar zone and any of these findings:

- Bone tenderness at A
- Bone tenderness at B
- Inability to bear weight both immediately and in the emergency department.

Foot films: A series of foot x-ray films is required only if there is any pain in mid- foot zone and any of these findings:

- Bone tenderness at C
- Bone tenderness at D
- Inability to bear weight both immediately and in the emergency department.

Modified from Stiell I.G., McKnight R.D., Greenberg G.H., et al, JAMA 1994; 271:827.©2010 UpToDate® Accessed December 2010.

Film footage of the Ottawa Ankle and Foot Rule may be found at the following site: <http://www.ohri.ca/emerg/cdr/ankle.html>

Imaging Tips

- The Ottawa foot and ankle rules predict midfoot and ankle fractures and help determine if imaging is necessary. Ottawa ankle and foot rules should be applied to patients with ankle and foot injuries
- If a calcaneal fracture is suspected document on the request form and always have a high index of suspicion for bilateral injury
- Views of the ankle commonly include AP, lateral and oblique. The base of the 5th metatarsal may be included in the films if clinically indicated (tenderness over the base of the 5th metatarsal as per the Ottawa ankle rules)
- Where a patient presents with an ankle injury and pain at the base of the 5th metatarsal, the nurse should give a brief description of the mechanism of injury and an anatomical description of sites of maximal tenderness. The examination should request an x-ray of the patient's (L) or (R) ankle. This information allows the radiographer to determine the best x-ray view
- Remember to check for proximal tibia/fibula tenderness as concurrent injuries can be present with ankle fractures

- The Ottawa rules should NOT be applied in patients under 18 years of age or if the patient is under the influence of drugs or alcohol. They should also not be applied if the patient has any reason for decreased sensation in their lower legs and feet (eg diabetic and alcoholic patients who may have a peripheral neuropathy).

Case Scenario 1

Refer to the Participant Manual and complete Case Scenario 1.

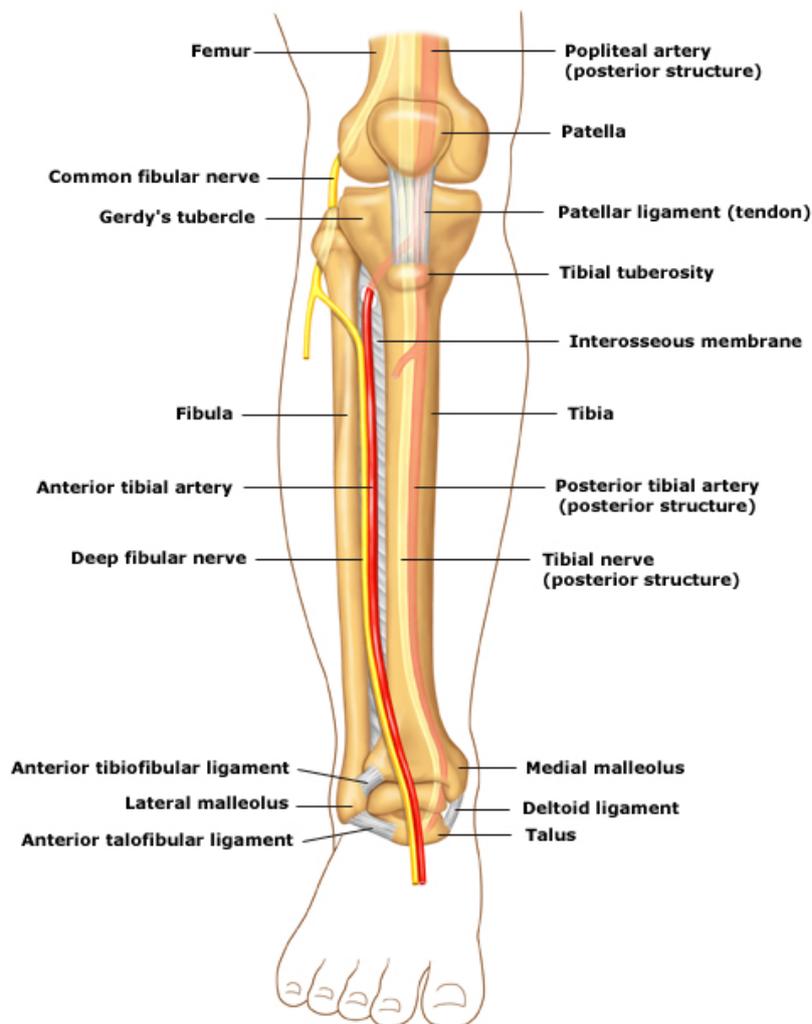
Case Scenario 2

Refer to the participant manual and complete Case Scenario 2.

The Tibia and Fibula

The tibia and fibula share in the weight-bearing role of the leg. The fibula bears 6% to 17% of the weight of the lower extremity depending on the position of the foot, with the load increasing with foot dorsiflexion and eversion. The tibia bears the remainder of the weight. The tibia and fibula are joined to each other by a synovial joint near the knee joint and by a strong relatively inflexible syndesmosis at the ankle. Together they form the lower part of the knee joint and the upper part of the ankle joint. (Figure 4)

Figure 4 *Anterior Anatomy of Tibia and Fibula*



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Mechanism of injury

- Fractures of the tibia and fibula may result from direct trauma or transmitted rotational forces
- In a similar fashion to the radius and ulna, the tibia and fibula are closely related via an interosseus membrane and ligamentous attachments at each end. Fracture of either of these bones should prompt suspicion of a fracture or dislocation of its partner
- Because of the subcutaneous nature of the tibia, compound fractures are reasonably common.

Physical assessment

1. Look: Observe for swelling, inflammation, deformity, and skin changes. Compare with unaffected side
2. Feel: Localised bony tenderness; crepitus
3. Note degree of movement within patient's pain limits
4. Undertake a pain assessment.

Specific neurovascular risks

- The common peroneal nerve (CPN) is vulnerable as it passes around the fibula neck. Injury to the CPN often results in foot drop
- The fascial compartments of the leg are at particular risk of compartment syndrome in association with tibia and fibula fracture. Elevation and regular neurovascular observations are vital.

Imaging tips

- An accurate anatomical description of the site of maximal tenderness will assist the radiographer to determine the best views for x-ray
- Views of the entire length of the tibia and fibula in at least two planes are necessary. The knee and ankle must be incorporated.

Key Points

- The common peroneal nerve (CPN) is vulnerable to injury as it passes around the fibula neck. Injury to the CPN may result in foot drop
 - Compartment syndrome is an important consideration in tibia and fibula fractures.
-

Activity

Refer to the Participant Manual and complete Learning Case Scenario 3.

The Knee

Anatomy and physiology of the knee

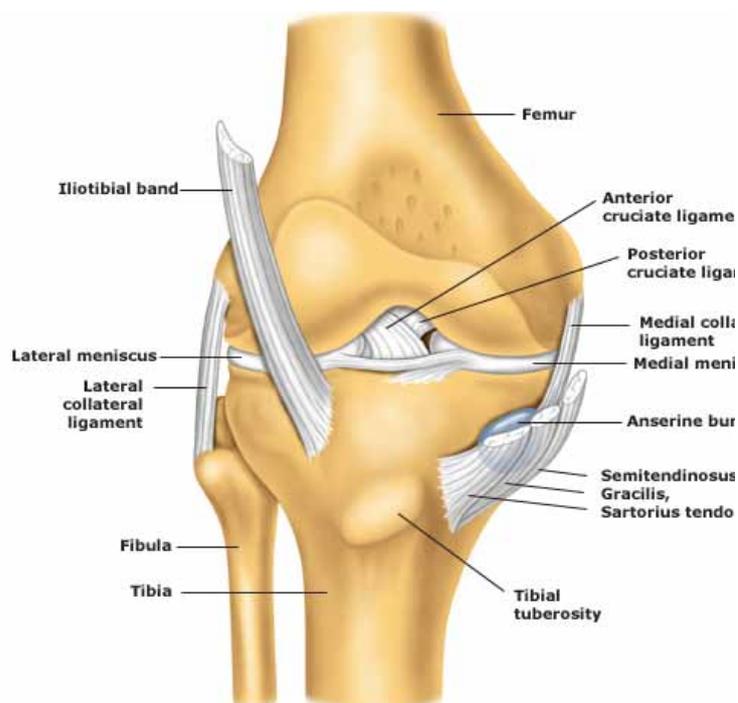
The knee is made up of 4 bones:

1. Femur – which has a medial and lateral condyle
2. Tibia – which has a medial and lateral plateau
3. Fibula Head
4. Patella.

The knee is precariously balanced and largely stabilised by its soft tissues which include:

1. Cruciate Ligaments – Anterior and Posterior
These ligaments prevent excessive forward and backward movement of the knee
2. Collateral ligaments – Medial and Lateral
These ligaments prevent excessive sideways movement of the knee
3. Meniscus (Cartilage) – Medial and Lateral
These are the shock absorbers for the knee and help maintain and smooth the movement of the femur on the tibial plateau
4. Quadriceps Tendon
This tendon attaches to the patella and allows extension of the knee (kicking).

Figure 5 *Anterior anatomy of the knee*



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Common mechanisms of injury

- Most knee injuries (85%) presenting to the ED are soft tissue injuries. However, these can be as complex and disabling as a fracture
- Knee trauma tends to result from direct trauma, axial loading or rotational forces
- Patella fractures are almost always associated with a direct impact
- Patella dislocations are common in younger adults and children.

Physical assessment of the knee

Remember you can use the opposite knee as a comparison for normal.

- Look for bruising, erythema, deformity, wounds, swelling
- Feel for warmth, effusion, patella position, tenderness, palpable distal pulses and sensation
- Note the degree of movement within patient's pain limits
- Undertake a pain assessment
- Apply the Ottawa Knee Rule.

Activity 2

Refer to the participant manual and complete Learning Activity 2.

Specific neurovascular risks

- If gross deformity is present, knee dislocation must be suspected and the patient urgently reviewed by a doctor. Although a rare injury, knee dislocation may be complicated by compression of the popliteal artery resulting in leg ischaemia; hence the diagnosis must be made immediately.

The Ottawa Knee Rule

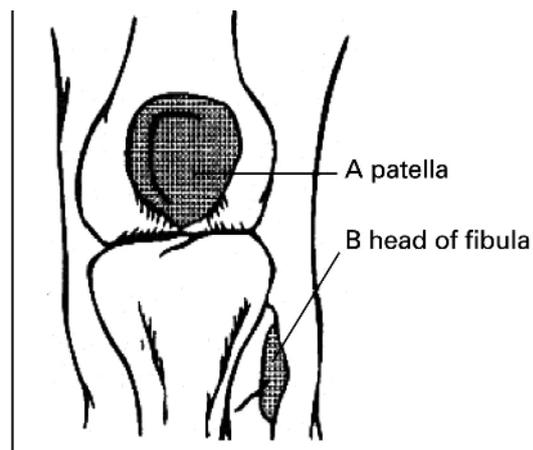
The use of the Ottawa Knee Rules assists in decision-making regarding Knee X-rays in acute injuries:

Figure 6 The Ottawa Knee Rule

An x-ray is indicated if the patient has any of the following features:

- Age > 55 years
- Inability to bear weight both immediately and in the emergency department (4 steps) **
- Isolated tenderness of the patella*
- Tenderness at head of fibula
- Inability to flex to 90°

*No bone tenderness of knee other than patella
 **Unable to bear weight twice onto each limb regardless of limping⁶



Can the Ottawa knee rule be applied to children? A systematic review and meta-analysis of observational studies D Vijayasankar, A A Boyle, P Atkinson Emerg Med J 2009;26:250-253

Downloaded December 2010 from: <http://emj.bmj.com/content/26/4/250/F1.large.jpg>

Film footage of the Knee Rule may be found at the following site: <http://www.ohri.ca/emerg/cdr/ankle.html>

Imaging tips

- Application of the Ottawa knee rules will lead to appropriate x-ray ordering
- Views will generally include an AP and lateral x-ray and are often best determined by the radiographer on the basis of an accurate anatomical description of the site of maximal tenderness
- Special views may include an oblique x-ray or an intercondylar view for suspected tibial plateau fracture and the patella skyline view for suspected patella fracture
- As with the Ottawa Foot and Ankle rules, this decision rule should not be used in patients under 18, any patient under the influence of drugs or alcohol, or any patient with a likely peripheral neuropathy.

Key Points

- Patella fractures are almost always associated with a direct impact mechanism
 - Neuro-vascular assessment is important as a knee dislocation may be complicated by compression of the popliteal artery resulting in leg ischaemia
-

Case Scenario

Refer to the participant manual and complete Case Scenario 4.

The Wrist and Hand

Anatomy and physiology of the wrist and hand

There are two surfaces of the hand and wrist – the palmar (or volar) and dorsum. Its margins are the radial (thumb side) and the ulnar (little finger side).

The wrist is comprised of 10 bones which are called carpal bones. They include the distal radius and ulna, scaphoid, lunate, hamate, trapezium, trapezoid, pisiform, and triquetrum.

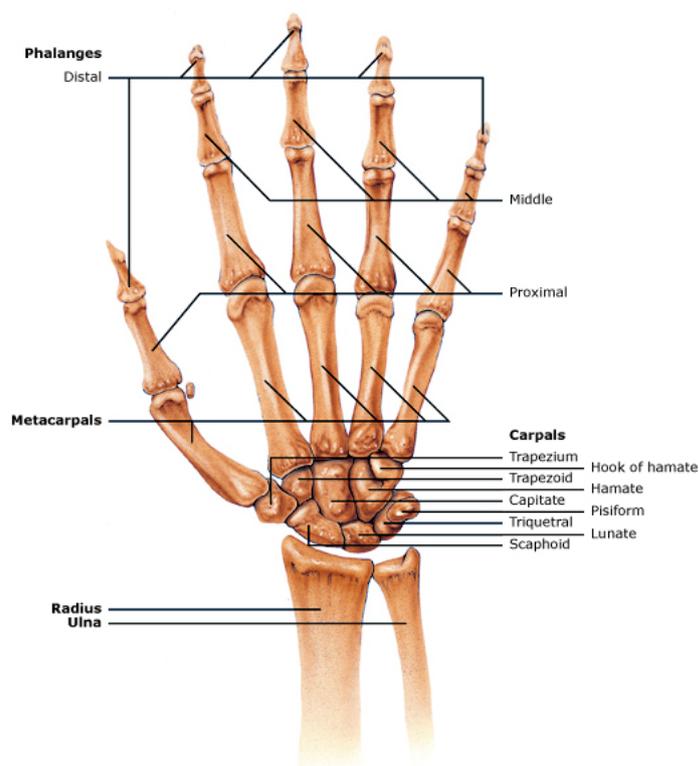
The bones of the hand are called metacarpals and include the thumb, index, middle, ring, and little.

Correspondingly the bones of the fingers include two phalanges in the thumb, and three phalanges in each of the other fingers known as the proximal, middle and distal phalanges (Figure 7).

The joints of each finger include the metacarpophalangeal (MCP), proximal interphalangeal (PIP), and distal interphalangeal (DIP) joints; the thumb has only two joints in the MCP and the interphalangeal (IP) joint (Figure 8).

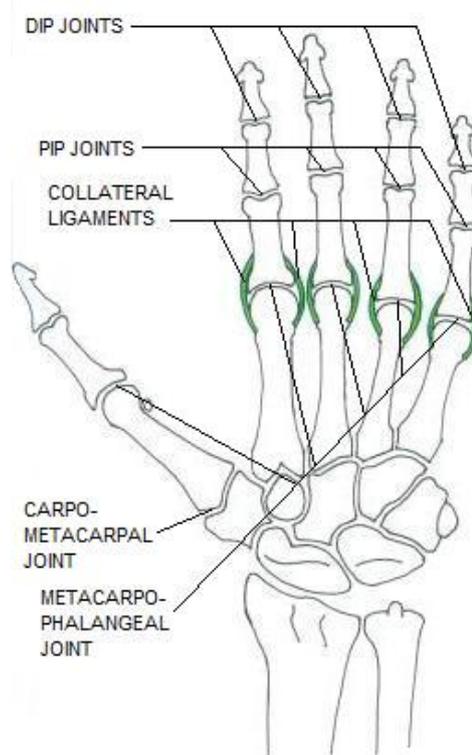
The bones are held together by a complex array of adjoining ligaments and tendons which stabilize the hand and wrist and permit complex movements.

Figure 7 *Bones of the Hand and Wrist*



Palmar view of the wrist and hand bones. Reproduced with permission from: Anatomical Chart Company.

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Figure 8 *Joints of the Hand and Wrist*

Downloaded December 2010 from: <http://www.joint-pain-expert.net/hand-anatomy.html>

Common mechanisms of injury

- Most wrist injuries, especially those of the radius, ulna and carpals, occur as a result of a fall onto an outstretched hand. Those with obvious clinical deformity (eg the 'dinner-fork' deformity of a Colles' fracture) should have a detailed urgent assessment and intravenous opiate analgesia considered
- Patients in severe pain must have their pain managed as a priority and should not be sent to the x-ray departments prior to analgesia
- Injuries to the metacarpals and phalanges generally result from a direct blow and knowledge of the forces applied can help predict the type of injury (eg Punch injury is associated with fracture neck of 5th metacarpal)
- Tenderness to the PIP may represent a volar plate fracture.

Physical assessment of the hand and wrist

- Look: note deformity, swelling, bruising, wounds (dorsal and palmer)
- Feel: temperature, site for bony tenderness, and check the neurovascular status
- *Scaphoid tenderness can be noted in the anatomical snuff box area (Figure 9) and is associated with axial compression pain to the thumb/wrist
- Note the degree of movement within patient's pain limits, observing for abnormal movement or loss of joint function
- Always compare opposite limb and examine the joints above (elbow)
- Undertake a pain assessment.

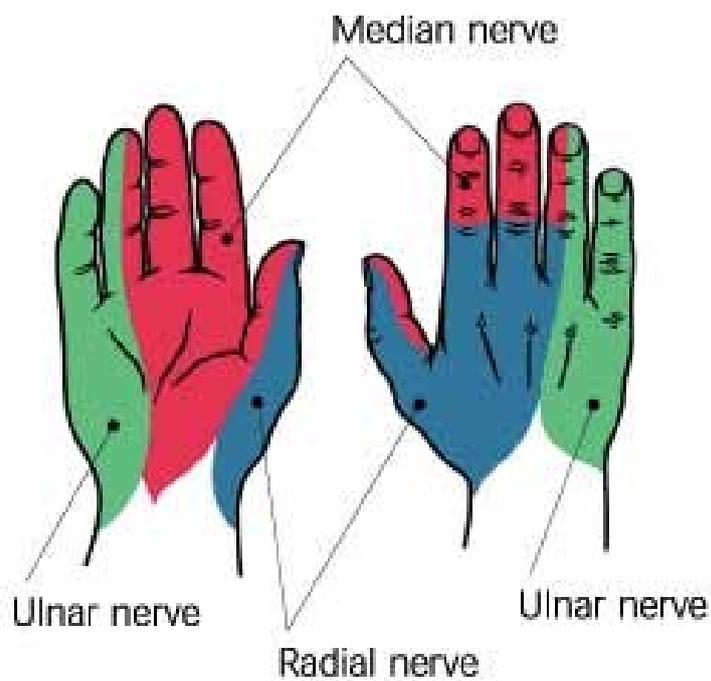
Figure 9 Surface anatomy landmark for scaphoid



*Anatomical Snuff Box

<http://www.orthopaedia.com/download/attachments/46432323/Nerves+of+the+Hand.jpg?version=1&modificationDate=1290722896000>

Figure 10 Nerve distribution in the hands



Specific neurovascular risks

- Dorsally angulated fractures of the distal radius can compress the median nerve as it traverses the palmar aspect of the wrist joint. Generally this will only occur with gross clinical deformity
- Neurovascular compromise is unusual in closed injuries of the hand and fingers in the absence of gross clinical deformity. However, it must be assessed, compartment syndrome can occur (Figure 10).

Activity 3

Refer to the participant manual and complete Learning Activity 3.

Imaging Tips

- An accurate anatomical description of the site of maximal tenderness will assist the radiographer to determine the best views for x-ray
- Views of the wrist generally include an AP, lateral and oblique. Hand and phalangeal injuries often include an AP and oblique view to best visualise all of the metacarpals and phalanges
- Specific 'scaphoid' views are requested if physical examination demonstrates tenderness over the anatomical snuffbox
- Request individual finger or thumb x-rays when there is tenderness beyond the metacarpals and involving the phalanges. Young children may have minimal swelling or deformity but end up having a greenstick fracture. Have a lower threshold for imaging these children or consider discussing the case with a doctor or nurse practitioner if you are uncertain.

Case Scenario 5

Refer to the participant manual and complete Case Scenario 5.

The Elbow (and Forearm)

Anatomy and physiology of the elbow (and forearm)

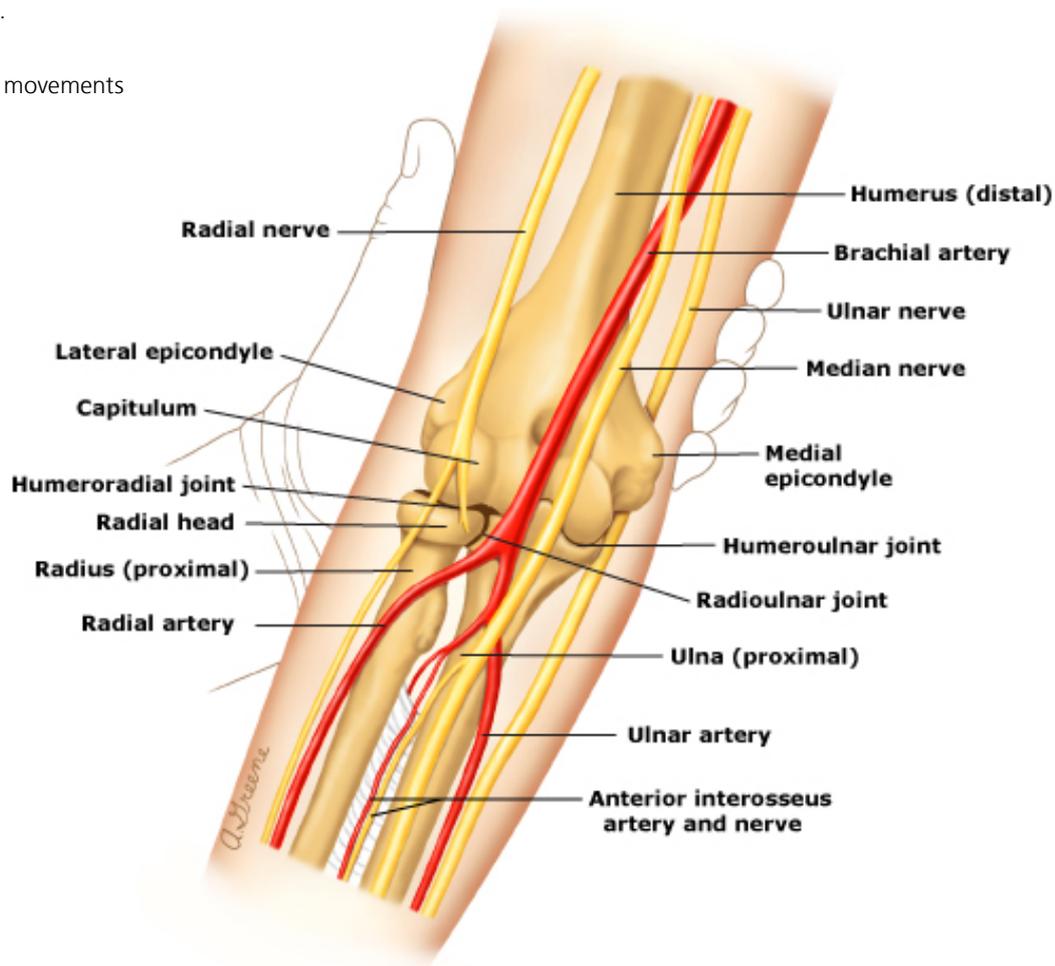
The elbow is a synovial hinge joint and is made up of 3 bones consisting of the distal end of the humerus articulating with the proximal ends of the radius and ulna. Within the elbow there are 8 key areas: (Figure 11 and Figure 12).

- Radial head
- Humeroulnar joint
- Proximal ulna
- Olecranon (elbow tip)
- Capitulum
- Medial epicondyle
- Lateral epicondyle
- Suprcondylar region.

There are 4 main elbow movements

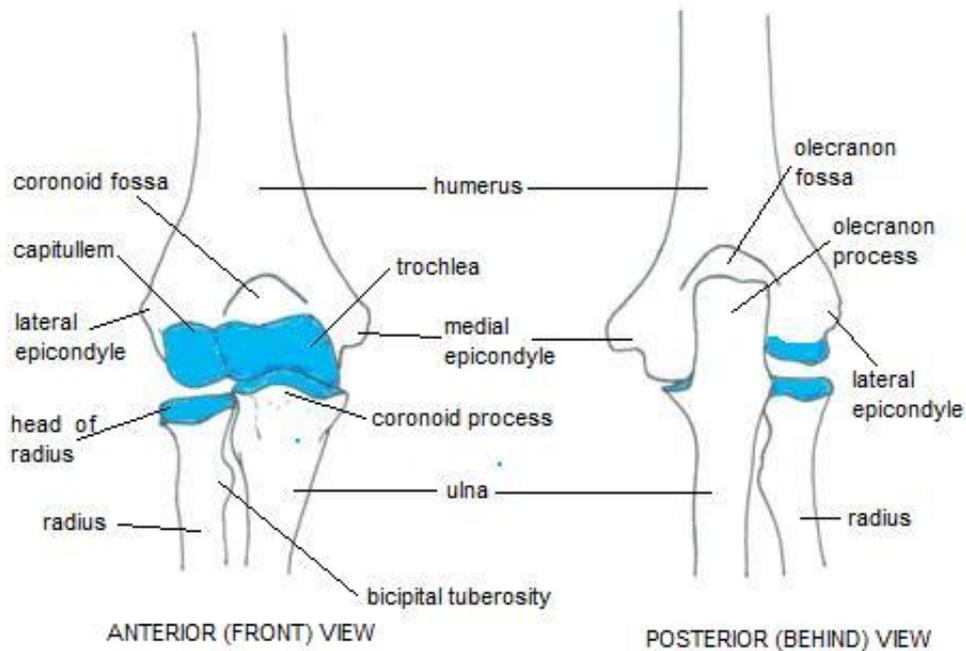
1. Elbow flexion
2. Elbow extension
3. Supination of wrist
4. Pronation of wrist.

Figure 11 *Anterior view of right elbow: major bones, arteries and nerves*



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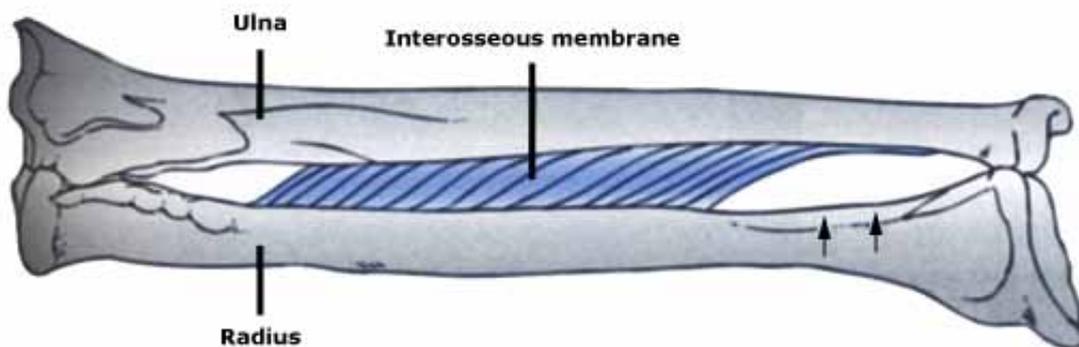
Figure 12 Anterior and posterior view of the elbow



http://www.joint-pain-expert.net/images/elbow_joint_anatomy001.jpg

Force applied to one bone is transmitted to the other bone by the interosseous membrane. The attachment and the fibres of the interosseous membrane are such that there is no attachment to the distal radius (Figure 13).

Figure 13 Forearm anatomy: interosseous membrane



Reproduced with permission from: Waters P.M., Mih A.D., *Fractures of the distal radius and ulna*. In: Rockwood and Wilkins' *Fractures in Children*, 6th ed, Beaty J.H., Kasser J.R. (Eds), Lippincott Williams & Wilkins, Philadelphia 2006. Copyright ©2006 Lippincott Williams & Wilkins. <http://www.lww.com> ©2010 UpToDate: ®Downloaded December 2010.

Common mechanisms of injury

- A fall onto the elbow, or direct force to the joint, are common mechanisms of injury
- A direct impact to the point of the elbow most commonly fractures the olecranon
- If the elbow is flexed at the time of the fall, a posterior elbow dislocation may result
- Forearm shaft fractures result from direct force most commonly due to a fall or impact by a weapon or sporting equipment
- Ligaments bind the radius and ulna tightly together so fractures of the shaft of one bone should lead the clinician to suspect fracture or dislocation of its partner. Combination fracture/dislocations of the forearm bones should always be suspected and x-rayed with this in mind
- A fall onto an outstretched hand with the elbow extended may result in a supracondylar fracture, intercondylar fracture or fracture of the radial head.

Physical assessment of the elbow and forearm

- Look: Note deformity, swelling, bruising
- Feel: Temperature, injury site for bony tenderness & neurovascular assessment
- Move: Note degree of movement within patient's pain limits, observing for abnormal movement or loss of joint function. An inability to straighten the arm should raise the index of suspicion for a fracture
- Always compare opposite limb and examine the joints above and below (shoulder and wrist)
- Undertake a pain assessment.

Specific Neurovascular Risks

- The brachial artery is vulnerable to compression by fractures and dislocations about the elbow, most commonly in relation to a displaced supracondylar fracture in children, but may also occur with elbow dislocations. Careful neurovascular examination is important in these cases as they require urgent medical treatment
- Ulna nerve neuropraxia (hitting "funny bone") is common with medial elbow injuries
- Damage to the median and ulna nerve occasionally complicates elbow fractures and dislocations.

Activity 4

Refer to the participant manual and complete Learning Activity 4.

Imaging tips

- An accurate anatomical description of the site of maximal tenderness will assist the radiographer to determine the best views for x-ray
- Any patient unable to fully extend (straighten) or supinate and pronate the arm from the elbow should be considered for x-ray*. Views of the elbow generally include an AP and lateral view. If a fracture of the radial head is suspected clinically (point tenderness over the radial head with increased pain on pronation and supination) then a "radial head view" may be required to visualise the fracture
- Tenderness distal from the proximal 1/3 (shaft) of the forearm requires an x-ray of the radius and ulna (radius+ulna)
- The radius and ulna will be x-rayed in 2 planes; usually AP and lateral.

* Appelboom A., et al, *Elbow extension test to rule out elbow fracture: multicentre, prospective validation and observational study of diagnostic accuracy in adults and children. Br Med J 337:a2428, December 9, 2008.*

Key Points

- Inability to completely straighten the arm is highly sensitive for an elbow fracture
 - Supracondylar and Radial head fractures are the most common fractures in the elbow
 - The brachial artery is vulnerable to compression by fractures and dislocations about the elbow, most commonly in relation to a displaced supracondylar fracture in children.
 - **Damage to the the median and ulna nerve occasionally complicates elbow fractures and dislocations.**
-

Case scenario

Refer to the participant manual and complete Case Scenario 6.

The Shoulder and Humerus

Anatomy and physiology of the shoulder and humerus

The dynamic relationship between the torso and the upper arm is established by the shoulder girdle.

The main feature of the shoulder is mobility rather than stability. As a result the shoulder is susceptible to injury much more easily than the hip which is a similar ball and socket joint.

The bones of the shoulder girdle include:

- Scapula
- Clavicle
- Humerus.

Important features of these bones are: (Figure 14 and Figure 15)

- Glenohumeral Joint (socket)
- Acromium (tip of the shoulder)
- Humeral Head (ball)
- The Acromioclavicular Joint (ACJ)
- The Coracoid process.

The upper limb is essentially suspended from the torso by two ligaments – the sternoclavicular ligament and the coraco-clavicular ligaments (trapezoid and conoid ligaments). This is important, as any disruption of these ligaments (eg from a fall onto the shoulder) results in significant instability of the shoulder joint and ongoing problems with the dynamic stabilisers of the shoulder joint such as the rotator cuff due to overuse.

The shoulder is supported at the glenoid by the glenohumeral ligaments and the rotator cuff muscles.

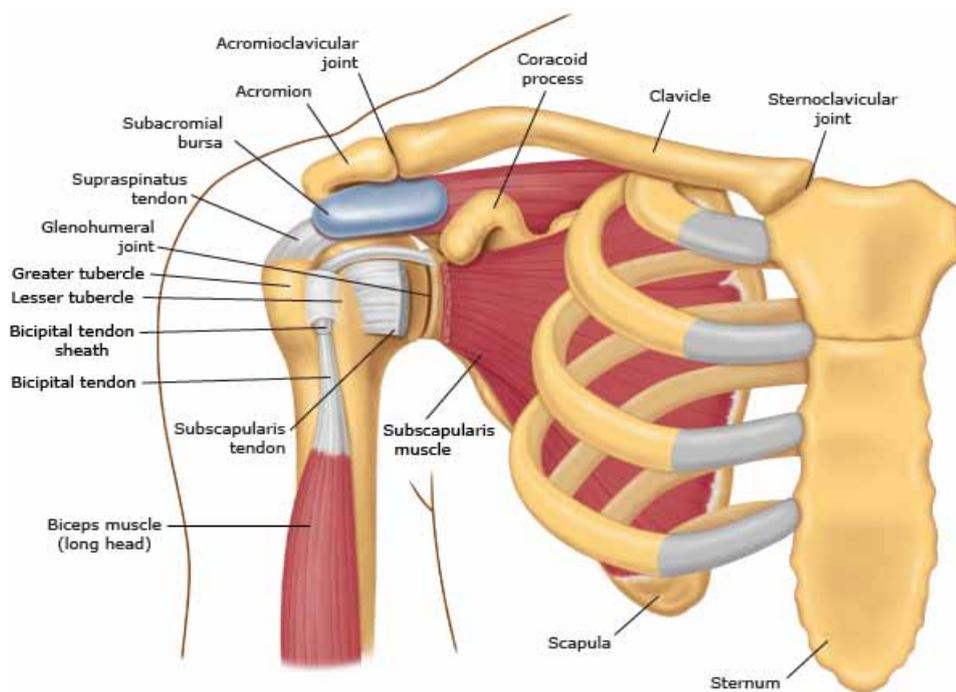
The rotator cuff muscles are vital to complex movements of the shoulder.

They are:

- Supraspinatus – abducts the shoulder
- Infraspinatus – laterally rotates the shoulder
- Teres Minor – laterally rotates the shoulder
- Subscapularis – medially rotates the shoulder.

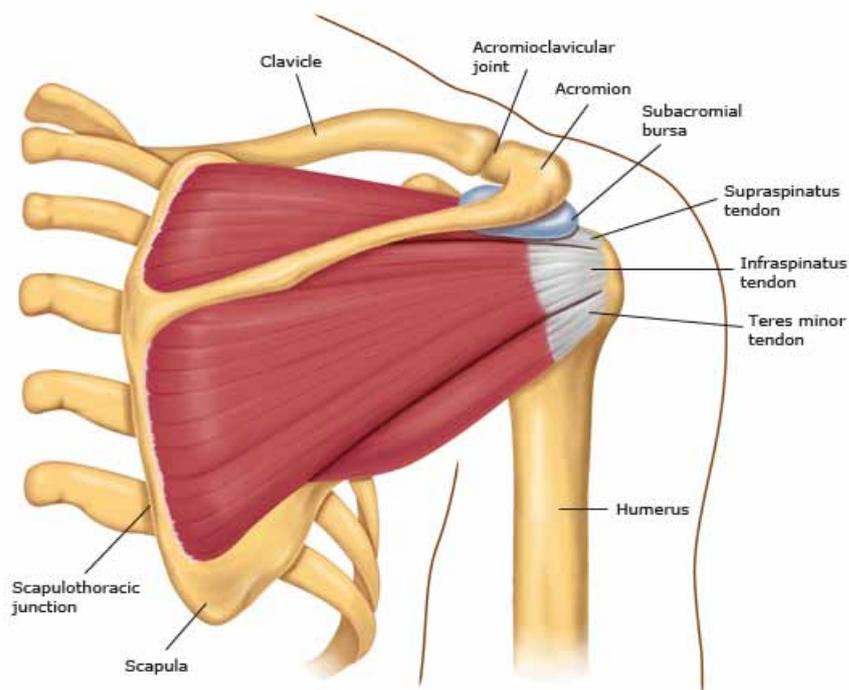
The subacromial bursa smooths the shoulder movements as it acts as a buffer between the acromium and the humeral head.

Figure 14 Anterior view of shoulder anatomy



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Figure 15 Posterior view of shoulder anatomy



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Common mechanisms of injury

- Fall -either onto an abducted or adducted shoulder
- Most fractures of the humerus are due to falls either onto an outstretched hand or a fall resulting in a lateral impact
- Acute shoulder pain may also result from referred pain from pulmonary disease, gastric, and cardiac mediastinal disease.

Physical assessment of the shoulder and humerus

1. Look: note deformity, swelling, bruising, wasting of muscles (front, side and back)
2. Feel: crepitus, temperature, injury site for bony tenderness, abnormal movement or loss of joint function, neurological deficit. Include the acromioclavicular joint, the clavicle and humerus
3. Movement: (Note degree of movement within patient's pain limits, observing for abnormal movement or loss of joint function)
 - abduction (0 – 170 degrees)
 - internal rotation
 - external rotation
 - adduction
 - backward extension (0 – 60 degrees)
 - forward extension (0 – 165 degrees).
4. Always compare with the opposite limb/joint
5. Undertake a pain assessment

(Oliver et al 2003, East London Emergency Nurse Practitioner Protocols, London UK).

Specific neurovascular risks

- Fractures to the humeral head or surgical neck of humerus can result in injuries to the axillary nerve. This may cause parasthesia to the skin around the deltoid muscle area. This is finding is called the regimental badge sign and requires urgent medical review
- The radial nerve is at risk for injury in midshaft humerus fractures as it passes around the proximal humerus in close association with the bone. Altered sensation to the hand about the dorsal wrist or thumb may be present or, in severe cases, the patient may have wrist drop.

Brachial plexus injuries are not common but can be associated with shoulder injuries and may be quite disabling.

Symptoms may include:

- weakness of the upper limb
- heaviness of the upper limb
- sensory disturbances like tingling or burning
(A feeling like an electric shock or a burning sensation shooting down the arm), numbness and arm weakness.

Signs and symptoms of more-severe injuries can include:

- The ability to use fingers, but little to no control of the shoulder and elbow muscles
- The ability to use the arm but not the fingers
- Complete lack of movement and feeling
- Severe pain.

Activity 5

Refer to the participant manual and complete Learning Activity 5.

Imaging Tips

X-ray should be considered when there is a history of injury and:

- Poor mobility of the upper arm
- Tenderness/swelling/bruising of the shoulder
- Tenderness/swelling/bruising of the midshaft humerus (Humerus X-ray)
- Point tenderness at the acromioclavicular joint (ACJ X-ray)
- Pain/swelling/deformity to clavicle (Clavicle X-ray).

Views of the entire length of the humerus in two planes incorporating the shoulder and elbow are necessary if there is midshaft humerus tenderness. Four images may be required depending on the patient's size.

Case Scenario

Refer to the participant manual and complete Case Scenario 7.

The Hip/Neck of Femur

This section pertains specifically to the neck of femur in an elderly patient and is not an overview of hip injuries/dislocations. Completion of this section is not mandatory unless specified by the facilitator.

Anatomy and physiology of the hip/neck of femur

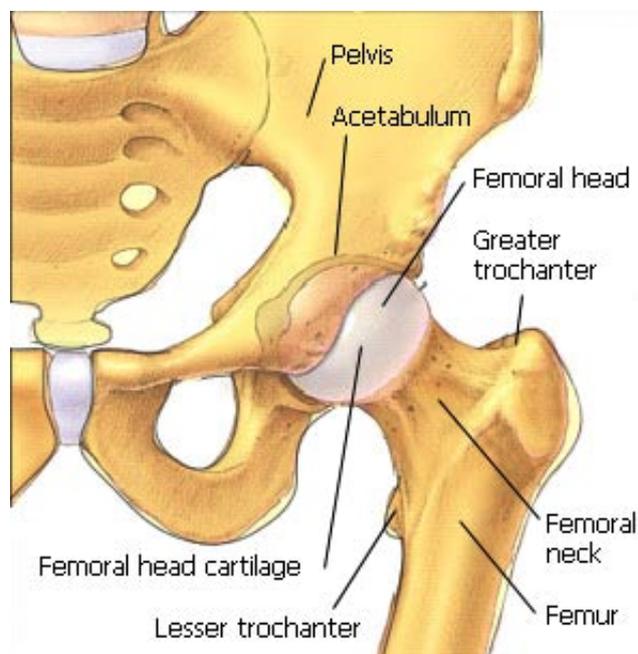
The pelvic girdle is similar to the shoulder but is much more rigid and less mobile. The pelvis forms a ring which is held securely by the sacroiliac joints and to a lesser extent the symphysis pubis. The hip carries the entire weight of the body through space and, in coordination with the upper body it stabilizes the body both at rest and during motion.

The hip joint is a very stable deep ball and socket structure. (Figure 16)

The bones which constitute the hip joint are:

- Acetabulum (socket)
- Head of the Femur (ball)
- Neck of Femur
- Greater and Lesser Trochanters.

Figure 16 *The hip joint*



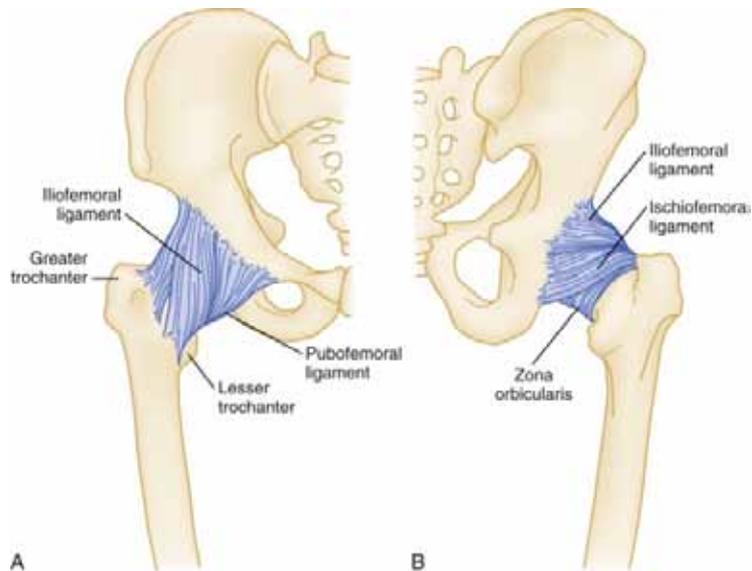
The hip is a ball-and-socket joint. hipsurgery.co.il Downloaded from Google Image, December 2010.

<http://www.hipsurgery.co.il/english/introduction.htm>

The 3 main ligaments which stabilise the hip (Figure 17) are:

- Iliofemoral
- Pubofemoral
- Ischiofemoral.

Figure 17 The hip ligaments



Marx: Rosen's Emergency Medicine, 7th ed.
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 Accessed online 15/12/2010 via CIAP

Hip Movements

The hip performs many complex leg movements:

- Abduction (moving the leg away from the midline)
- Adduction (moving the leg towards the midline)
- Flexion (moving the knee forwards)
- Extension (moving the knee backwards)
- Lateral/External Rotation (twisting foot outwards)
- Medial/Internal Rotation (twisting foot inwards).

Figure 18 Hip movements

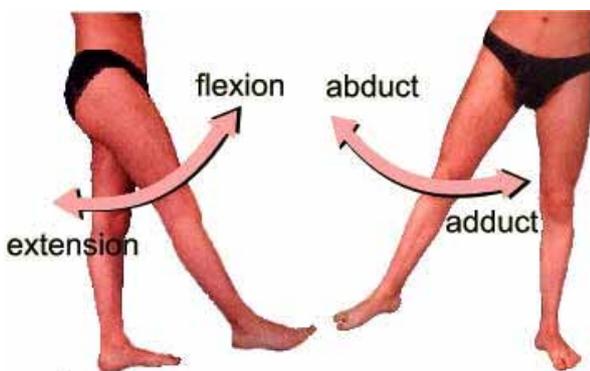
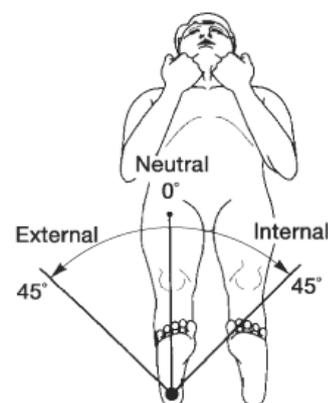


Figure 19 External/Internal Rotation



http://www.mendmeshop.com/_img/hipmovements.jpg

Downloaded with permission from: http://www.csmisolutions.com/images/products/humac/patterns/pattern22_diagram_lg.gif

Common mechanism of injury

History of recent, mechanical fall in an elderly person.

Pubic rami fractures similarly present after a fall onto the hip or buttocks.

Physical assessment of the hip joint

1. Look: for bruising/erythema, deformity, wounds, swelling, external rotation/shortening
2. Feel: Palpate the area to elicit tenderness, swelling, palpable distal pulses and sensation
3. Move: Note the degree of movement within patient's pain limits
4. Undertake a pain assessment.

Specific neurovascular risks

Proximal and mid thigh tenderness should alert the clinician to consider a fractured shaft of femur. These have serious vascular risks and a patient may lose up to 3000mls of blood. They frequently involve significant mechanisms of injury which should alert the clinician to consider associated major trauma injuries.

(Walsh R. W. 2002. Musculoskeletal injuries. In K. McQuillan, K.V.Reuden, R. Hartsock, M. Flynn, & E.Whalen (Eds.) Trauma nursing: from resuscitation through rehabilitation (3rd Ed.) Philadelphia: W.B.Saunders.

Imaging tips

The decision to x-ray a hip for a neck of femur (NOF) fracture is usually aided by the presence of:

- Pain between hip and knee and inability to walk
- Inability to weight bear
- Deformity (shortening or rotation) or
- History of a hip prosthesis or
- Bony tenderness to the hip (greater trochanter).

**Occult fractures occur in up to 30% of cases.*

** Galloway et al (2004) Diagnostic Radiology: Patterns of injury in patients with radiographic occult fracture of neck of femur as determined by magnetic resonance imaging. Australasian Radiology (2004) 48, 21–24.*

Key Points

- Non weight bearing, greater trochanter tenderness and external rotation of the hip often indicate # NOF
 - Proximal thigh deformity and tenderness may indicate a fractured SHAFT of femur. Local guidelines will determine the nurse initiated x-rays in this case. Early medical review is recommended
 - The non weight bearing patient should be considered to have a fracture until proven otherwise.
-

Ionising Radiation Information

What is ionising radiation?

Radiation comes from atoms, the basic building blocks of matter.

Certain atoms (radionuclides) are 'unstable' or 'radioactive'. The nucleus can undergo a spontaneous change towards a more stable form, losing energy which is emitted as radiation (radioactive decay). If the atom decays with emission of an alpha or beta particle, it becomes a new element. Radiation is also emitted when one form of a radioisotope changes into another (its isomer), releasing gamma radiation. The excited form has an "m" beside its atomic number (eg Tc-99m decays to Tc-99).

The three main forms of radiation are alpha, beta and gamma radiation (X-rays are identical to gamma radiation, except that they are produced artificially, from electrons rather than the nucleus). Alpha and beta radiation consists of sub-atomic particles that travel at just below the speed of light. Gamma radiation and X-rays are waves of energy that travel at the speed of light.

- Alpha particles consist of two protons and two neutrons. They are large and have little penetrating power (can be stopped by a piece of paper), but if taken into the body (eg by inhalation) can cause damage because they give up their energy over a relatively short distance
- Beta particles are fast-moving electrons ejected from the nuclei of atoms. They are small, can penetrate 1-2 centimetres of water or human tissue, and can be stopped by a sheet of aluminium a few millimetres thick
- Gamma radiation and X-rays penetrate matter more easily than the particulate radiations. They can pass through the human body, and thick barriers of concrete, lead or water are normally required to absorb their energy.

Radiation can interact with surrounding matter to produce electrically-charged particles called ions, hence the term 'ionizing radiation'. This process can cause damage to living tissue.

Background and man-made radiation

Background radiation is that which is naturally and inevitably present in the environment, and consists of cosmic and terrestrial radiation. It is the main source of radiation exposure for most people, and levels range from 1.5 to 3.5 mSv per year (but can be >50 mSv/yr).

Terrestrial radiation is present in the earth from when it was formed. Levels are higher in granite areas or on mineralised sands. Radon is a radioactive gas that emanates from the soil and tends to concentrate in buildings, but in Australia it contributes only a small proportion of background dose. The human body is naturally slightly radioactive due to the presence of radioactive potassium.

Cosmic radiation bombards the earth from space. It is more intense at higher altitudes where the earth's atmosphere gives less protection. The dose rate at 12,000 metres is ~150 times the sea level dose.

Ionising radiation is generated in a range of medical, commercial and industrial activities. The most familiar and the largest of these sources of exposure are medical X-rays.

Natural radiation contributes about 88% of the annual dose to the population and medical procedures most of the remaining 12%.

Source Of Exposure	Exposure
Seven Hour Aeroplane Flight	0.05 mSv
Chest X-Ray	0.04 mSv
Total Natural Radiation	1.5 mSv per year
Cosmic Radiation Exposure of Domestic Airline Pilot	2 mSv per year
Chernobyl (People living in Control Zones near Chernobyl)	10 mSv per year

Measuring radiation

The amount of a radioactive material is given in becquerel (Bq). One becquerel is one atomic decay per second. The 'dose' received by a person is measured in terms of the energy absorbed in the body tissue, and is expressed in gray. One gray (Gy) is one joule deposited per kilogram of mass.

Equal exposure does not produce equal biological effects, eg one gray of alpha radiation will have a greater effect than one gray of beta radiation. The effective (or equivalent) dose is therefore expressed in sievert (Sv), which equals the dose (Gy) multiplied by an effectiveness factor. One sievert (Sv) produces the same biological effect, regardless of the type of radiation.

How much ionising radiation is dangerous?

The degree of damage caused by radiation depends on many factors - dose, dose rate, type of radiation, the part of the body exposed, age and health, for example. Embryos including the human foetus are particularly sensitive to radiation damage.

At high doses (>1 sievert), ionising radiation can result in massive cell death, organ damage and possibly death to the individual.

Additionally, large doses can cause a measurable increase in the incidence of cancers and leukaemia's after some years. The risk of getting cancer from 1 mSv of radiation exposure is equivalent to the risk from smoking approximately 100 cigarettes.

It can also cause genetic mutations that affect future generations, although there has been no evidence of radiation-induced mutation in humans.

10 Sv	Short-term, whole-body dose – immediate radiation sickness and subsequent death
2-10 Sv	Short-term, whole-body dose – severe radiation sickness with increasing likelihood of subsequent death
>1000 mSv	Short-term, whole-body dose – immediate radiation sickness, but unlikely to cause death
>100 mSv	Short-term, whole-body dose – increased probability of cancer. The estimated risk of fatal cancer is 5 of every 100 persons exposed to a dose of 1000 mSv
50 mSv	The lowest dose at which there is any evidence of cancer being caused in adults. It is also the highest dose which is allowed by regulation in any one year of occupational exposure.

There are four ways in which people are protected from identified radiation sources

1. Limiting time: dose is reduced by limiting exposure time.
2. Distance: the intensity of radiation decreases with distance from its source.
3. Shielding: Barriers of lead, concrete or water give good protection from penetrating radiation such as gamma rays.
4. Containment: Radioactive materials are confined and kept out of the environment.

Radioactive isotopes for medical use, for example, are dispensed in closed handling facilities.

Standards and regulation

Most countries have their own systems of radiological protection which are often based on the recommendations of the International Commission on Radiological Protection (ICRP).

The ICRP recommends that the maximum permissible dose for occupational exposure should be 20 mSv per year averaged over five years, with a maximum of 50 mSv in any one year. People who are occupationally exposed to ionizing radiation can be monitored with a dosimeter which is worn as a badge attached to clothing.

For public exposure, 1 mSv per year averaged over five years is the limit.

In both categories, the figures are over and above background levels, and exclude medical exposure.

In Australia, radiation protection regulations are set by States and Territories, as well as by the Environment Protection (Nuclear Codes) Act 1978.

Radiation Doses

Examination	Typical effective dose (mSv)	Approximate equivalent no. of chest X-rays	Approximate equivalent background exposure
X-rays			
Limbs and joints (except hip), nasal, facial, mandible, OPG	≤0.01	≤0.5	≤1.5 days
Soft tissues	0.003 – 0.07		
Chest (single PA)	0.02	1	3 days
Chest (PA + lateral)	0.042	2	6 days
Skull	0.07	3.5	11 days
Cervical spine	0.07	3.5	11 days
Thoracic spine	0.7	35	4 months
Lumbar spine	1.3	65	7 months
Hip	0.3	15	7 weeks
Pelvis	0.7	35	4 months
Abdomen	1.0	50	6 months
CT			
CT head	2.3	115	1 year
CT neck	2.5	125	15 months
CT chest	8	400	3.6 years
CT abdomen or pelvis	10	500	5 years
CT spine	4	200	2 years
CT pulmonary Angiogram	6	300	3 years
CT KUB	3 - 5	150 - 250	1.5 - 2.3 years

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Australian Government
**Australian Radiation Protection
 and Nuclear Safety Agency**

<http://www.arpansa.gov.au/>

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1.6 Wound Care

Statement of Purpose

The aim of this module is to emphasise the importance of an accurate wound assessment and appropriate initial management of wounds in the Emergency Department. This is not only to ensure that no harm is done but also that we promote healing and better outcomes for the patient. Completion of the e-learning will enable the CIN to undertake a full wound assessment and plan initial wound care.

Learning Outcomes

At completion of this module it is anticipated that participants will be able to:

- Demonstrate a wound assessment
- Discuss factors that may delay wound healing and compromise tissue viability
- Discuss strategies to promote wound healing
- Identify possible red flags that may signify greater risk to the patient and identify when referral to other health professionals is required
- Analyse and reflect on dressing categories for particular wound types
- Demonstrate the ability to make effective treatment decisions and initiate further investigation as required.

Discussion

It is recognised that the CIN role requires the RN to be able to assess and apply appropriate first aid to wounds as a minimum. In some cases CINs may play a role in further management of particular wounds. This module does not recommend particular wound dressings, or discuss definitive wound management such as gluing and suturing.

On researching this topic, an excellent evidence based online learning package has been located. It has been developed by WoundsWest, and NSW Health has been given approval for CINs to utilise this training. CINs can apply to gain Continuing Nurse Education (CNE) points on completion of modules.

The core module provides excellent information on wound types and wound assessment and is to be completed as a minimum.

The skin tear and burns modules are recommended, to assist the CIN with wound assessment and first aid, however local or state guidelines are to be used in the management of these wounds.

The trauma wounds module (due for completion in 2011) is also expected to be of benefit for ED nurses.

CIN participants must abide by the 'Terms of Agreement' issued by WoundsWest.

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The WoundsWest Module Homepage Link is:

<http://woundswest.articulate-online.com/1656235026>



Section 2

2.1 Care of the Patient with a Mental Health Presentation

Statement of Purpose

The aim of this module is to provide practical guidance for the CIN in the initial assessment and management of patient's with mental health presentations in the waiting room.

Learning Outcomes

At completion of this module the CIN will be able to:

- Identify the essential elements of a mental health history and discuss the symptoms and management of various mental health presentations to the emergency department
- Discuss some of the risks to patient/carers and nursing staff when managing a patient with mental health issues in the waiting area
- Describe the management strategies for the acutely aggressive patient in the waiting room area
- Identify the main differences in the management of children, adolescents and elderly patients presenting with a mental health problem.

Background

The management of patients with Mental Health presentations in emergency situations is a growing concern with increasing numbers of distressed or disturbed patients presenting to Emergency Departments. These patients can present in a considerably distressed state, distress others and be frequent users of ED services (Proctor, 2007).

This mental health module should be read in conjunction with the NSW Mental Health and Drug and Alcohol Office, "Mental Health for Emergency Departments – A Reference Guide" (2009). This reference is available in all EDs, and also via the following NSW Health Intranet link: http://internal.health.nsw.gov.au/pubs/2009/mh_emergency.html

The focus of this CIN module is the management of patients who are in the waiting room. It should be noted that this is not a comprehensive resource on caring for patients with mental health presentations, and additional resources and reading should be sourced if the reader requires further information.

Initial Assessment

The primary role for the CIN is to monitor and detect changes in the person's mental state whilst they are in the ED waiting area. Proctor (2007) recommends the use of the following questions to guide decision making:

- Can I safely interview this patient on my own, or do I need back up?
- Is the patient going to be safe where they are?
- Can they be left alone and/or with others safely?
- What degree of observation do they need and can it be provided in the ED waiting room?
- Where is the most appropriate place to interview the patient given their level of arousal and agitation?

Answering each of these questions will enable the CIN to determine whether assessment and ongoing monitoring is suitable for the waiting room, in the clinical area or in a safe assessment room.

When interviewing mental health patients and their carers the following points will assist you:

- Maintain a courteous, calm controlled manner/approach – people who are fearful can be reassured by a calm presence
- Introduce yourself and explain the ED assessment process
- Even when acutely psychotic, a person can usually communicate and interact rationally
- Do not assume a person who expresses bizarre ideas is less intelligent
- Talk directly to the person and not behind their back - people with mental health issues can easily misinterpret what is said
- Anticipate the patient's needs (eg treat pain or other symptoms, provide information, offer food/drinks)
- Keep patients and families informed of waiting times, delays and the reasons for these.

Key Points

- It is vitally important that you introduce yourself by name, explain what your role is in the ED and what you need to do to help the patient
- For example: *'Hi, I am Jane and I am the waiting room nurse. I need to ask you some questions so that we can help you'*
- Explain in concrete, simple terms about the ED process and what to expect.

While these processes are familiar to you, they are not necessarily evident to all ED patients.

Adapted from: Mental Health and Drug and Alcohol Office, 2009, p16.

Physical Examination

Patients presenting with a mental health complaint or symptoms may have an underlying physical illness that precipitates these symptoms (eg aggressive behaviour or visual hallucinations may be secondary to delirium).

The main aim of the physical examination is to reasonably exclude an organic disease:

- As a cause for the presentation, or
- As a clinical issue that requires acute management.

An organic cause for the presentation is more likely with:

- new presentations
- the elderly
- where there are abnormal vital signs
- atypical symptoms (eg visual hallucinations). A physical examination must be guided by the history and presenting symptoms and as a minimum an exam should include a baseline set of vital signs and a full cardiovascular, respiratory, gastrointestinal and neurological system assessment. From this evaluation routine diagnostic investigations may be ordered as clinically indicated and may include as indicated, full blood count, urea & electrolytes, blood glucose, liver function test and thyroid function test.

Mental State Examination (MSE)

The Mental State Examination (MSE) is designed to obtain information about specific aspects of the individual's mental experiences and behaviour at the time of interview (Proctor, 2007). This tool is used to assess and describe a person's mental state and the use of this terminology can greatly assist communication between clinicians. These concepts can significantly enhance the clinician's ability to recognise important changes in a person's mental state.

For those patients who are noncompliant or uncooperative this information is usually collected through observation over a period of time and/or obtained from the patient's carer, relatives or friends. The following information includes important items to be observed for and considered during your CIN assessment.

Appearance:	Attire, cleanliness, posture (sitting/standing) and gait
Behaviour:	Facial expression, relaxed or cooperative or aggressive. Describe in detail; activity, agitation, level of arousal (including physiological signs).
Speech:	Form and pattern of language spoken, volume and rate. Is it coherent, logical and congruent with questioning?
Mood:	Apathetic, irritable, labile, optimistic or pessimistic, thoughts of suicide.
Thought:	Particular preoccupations, ideas or beliefs. Are they rational, fixed or delusional? Do they concern the safety of the patient or others? Do they relate to the persons attire, speech or mood and if so how?
Perception:	Abnormalities including hallucinations occurring in any of the senses (auditory, visual, smell, taste, touch).
Intellect:	Brief note of cognitive and intellectual function. Is the patient orientated to time, place and person? Is the patient able to function intellectually at a level expected from their history?
Insight:	How does the patient explain or attribute their symptoms? What is the patient's understanding of the factors contributing to their current situation? How does the patient perceive their need for care and/or treatment?

Proctor, NG (2007) Mental Health Emergencies cited in Curtis K, Ramsden C, and Friendship J. Emergency & Trauma Nursing. Elsevier Australia: China.

Activity 1

Refer to the participant manual and complete Learning Activity 1.

Waiting Room Observations

Where the patient is deemed safe to wait in the waiting room, the CIN must be able to maintain discrete observations of the person ie watch what they are doing and record/report significant changes. At regular intervals directly ask the person how they are, and update them on their wait. Also invite communication from those accompanying the patient and reassure the carer that they can ask you questions during their stay. This will build a rapport with the patient/carer and allow for ongoing open communication to take place. You should observe for early signs and symptoms of potential escalation in aggression such as increasing agitation, restlessness, pacing, uncooperative behaviour and anxiety. As the CIN you should consider escalating care if there is any evidence of increasing behavioural disturbance.

Environmental Issues

People who present with psychosis are less able to filter out sensory information and they are very sensitive to their environment. These patients can be quickly overwhelmed in noisy, busy areas such as an ED. People with anxiety or a trauma history may also become very withdrawn in a busy environment. Patients who are frightened may respond by becoming very quiet to make themselves less of an obvious target or conversely, they may respond by escalating their behaviour. The risk of harm can be exacerbated by the environment (over-stimulation) or interactions with others (including treating staff). Close observation and ongoing open communication with these patients and their carers are important to identify patient specific risks.

Referral Pathways

Mental Health Services should be involved after the initial triage and risk assessment to provide assistance in assessment and discharge planning. For some presentations, patient assessment by specialist mental health services is needed before they leave the ED, for others it will be sufficient for clinicians to consult with the mental health team and arrange for follow-up at a later time (Mental Health and Drug and Alcohol Office, 2009). Referral pathways for person's presenting to EDs for Mental Health services are highly variable from site to site. Many EDs do not have immediate access to specialist Mental Health clinicians. It is essential the CIN is familiar with their own local practices and communicates these to their patients and carers.

Special Populations

Many of the mental health problems and symptoms seen in adults can also occur in children, adolescents and the elderly; however your approach to these patients should be to include a focused physical assessment in every case. Assessment of organic factors should always be considered in the context of the history. You should also consider in your assessment the possibility of child protection issues, as well as elder abuse problems which often is unrecognised. Assessment should also include the coping capacity of the carer and a review by a social worker may be indicated in these patient groups. For child and adolescents with mental health issues, there needs to be a guardian present at all times they cannot be left alone for any reason.

Further information on Child Protection is available at NSW Health Child Protection – Interagency Guidelines for Child Protection Intervention, 2006 http://www.health.nsw.gov.au/pubs/2006/pdf/iag_childprotection.pdf
Further information on Elder Abuse is available at NSW DADHC Interagency Protocol for Responding to Abuse of Older People, 2007. <http://www.dadhc.nsw.gov.au>

Red Flags

The CIN must be vigilant of the major risks for mental health patients presenting to the ED, these may include:

- Patients at risk who abscond
- Aggression
- Self harm/suicide
- Mental illness not being recognised
- Misdiagnosis or missing a physical cause for the problem
- Severity or risk/s not being identified
- Attempting to manage risks without the available resources.

Reference: Mental Health and Drug and Alcohol Office, 2009, p6.

Suicide/Self Harm

The CIN's primary responsibility should be to ensure the safe wellbeing of the patient and other patients/carers who are waiting in the waiting room. Patients, staff and the general public are entitled to be protected from harm of injury in all settings. Patients presenting with behavioural disturbance may pose a safety risk to themselves or others and may not be appropriate for the waiting room area. Patients who have been identified as being at risk of suicide must never be left alone. If the risk is considered low they may be left briefly in the care of someone such as a responsible family member. If they are not able to be found their absence must be reported immediately and appropriate action taken ie this may require contacting the police. For further information on the management of these patients refer to the Guidelines in 'Framework for Suicide Risk Assessment & Management for NSW Health Staff'. http://www.health.nsw.gov.au/pubs/2005/pdf/suicide_risk.pdf

Risk of Violence

Not all people with mental health issues are violent; however physical threat of immediate injury to the patient or others should be treated as an emergency requiring immediate intervention. The CIN should take due care with patients who exhibit the following Red Flags:

▶ *Red Flags*

The CIN must be vigilant of the major risks for mental health patients presenting to the ED, these may include:

- Overtly aggressive/threatening behaviour
- Recent history of aggression/using weapons
- History of impulsive behaviour
- Expressing delusions/hallucinations with a violent content
- Drug and/or alcohol intoxication.

The CIN should:

- never approach an aggressive person
- if possible, have a duress alarm at hand
- always maintain a safe distance when talking to an aggressive patient (minimum of two metres) and
- refer to local policies and procedures for management of aggressive or resistive behaviour and code black responses.

Key Points

- Approach in a calm confident manner and avoid sudden or violent gestures
 - Allow the patient ample personal space
 - Call for help early ie security/police
 - Never confront a violent person on your own
 - Do not put yourself in danger ie when in danger, your priority is YOUR safety
 - Retreat to a safe location and continue to call for help
 - Never turn your back on a potentially violent patient until well clear.
-

Psychiatric Medications

There are many psychiatric medications which may cause adverse physical side effects and result in serious medical emergencies. When completing your nursing assessment a thorough medication history should be considered on patients taking antidepressants or antipsychotic medications. Have a low threshold for consulting a senior ED medical officer if you note any of these red flags:

Acute Dystonia	Difficulty swallowing, torticollis (head forced to one side), retrocollis (head forced backward), oculogyric crisis (eyes rolled upwards or laterally), dysphagia, laryngospasm (listen for stridor).
Akathisia	Internal restlessness (legs), fidgeting, pacing, inability to stay still.
Serotonin Syndrome	Restlessness, agitation, abdominal cramps, diarrhoea, myoclonus/clonus, hyperreflexia, confusion, diaphoresis, flushing, tremor, unconsciousness, renal failure.
Lithium Toxicity	Diarrhoea, vomiting, tremor, dysarthria, ataxia, twitching, seizures, hypotension, confusion, ECG changes, arrhythmias, symptoms of renal failure.
Neuroleptic Malignant Syndrome (NMS)	Hyperthermia, muscle rigidity, autonomic dysfunction and altered consciousness, tachycardia, diaphoresis, labile BP, sialorrhoea, nausea, dysphagia.
Agranulocytosis	Should be considered in any patient taking antipsychotics or carbamazepine and presenting with fever and malaise or other signs of infection.

Key Point

- Further information on the management of mental health emergencies can be obtained from the Mental Health and Drug and Alcohol Office (2009) *Mental Health for Emergency Departments – A Reference Guide*.

Activity 2 Case Scenarios

Refer to the participant manual and complete Learning Activities 1 and 2.

References

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2.2 Care of the Patient with a Minor Trauma Presentation

Statement of Purpose

The aim of this module is to emphasise the importance of reassessing “minor” trauma patients that have been triaged into the waiting room and are waiting to be reviewed and treated. It is also to assist the CIN in developing skills to identify trauma patients that are considered ‘at risk’ or those more commonly referred to as having ‘red flags’.

Learning Outcomes

Following completion of this module, participants will be able to:

- Identify at risk groups with minor trauma and escalate observation and treatment options
- Demonstrate a systemic approach to history taking and physical assessment for the patient with a traumatic injury
- Discuss the red flags that are specific to patients presenting with minor trauma and those that require escalation.

Trauma defined

Trauma is defined as an uncontrolled acute source of energy that makes contact with the body and cannot be tolerated. Energy may emanate from mechanical motion (kinetic), chemical electrical heat, or radiation. In addition, frostbite may occur when heat and oxygen are absent in that part of the body (Stewart & Allen 2007).

Most traumas are blunt trauma and injury occurs as a result of acceleration and deceleration, compression, or shearing forces. Shearing forces may cause tearing of tissues, organs, muscles, and ligaments anywhere in the body; resultant bleeding may be occult and catastrophic. Air filled organs such as the lungs bowel and stomach are also subject to damage (Dickenson 2004).

Major and minor trauma

Traumatic injuries are commonly divided into the categories of major and minor for the purposes of transport to trauma centres and activation of trauma calls. The MIST criteria are used by the NSW Ambulance Service to guide decision making about transport of the trauma patient to hospital (Figure 1). It assesses the patient against criteria that have been shown to distinguish major trauma. Many EDs have their own trauma calling criteria based on similar factors.

M MECHANISM OF INJURY

Blunt

- Transport Incident:
 - Death in same vehicle
 - Intrusion into occupant compartment > 30cm
 - Steering wheel deformity
 - Patient side impact
 - Vehicle v pedestrian/cyclist/MBC
 - Ejection from vehicle
 - Entrapment with compression
- Focal blunt trauma to head or torso
- Falls > 3m or paediatrics twice the child's height
- High voltage injury
- Crush injury excluding fingers/toes
- Any rapid deceleration mechanism that results in a large inertia change at impact

Patients <16 & >65 years of age, Obstetric patients > 20 weeks gestation, patients on anticoagulants and patients with pre-existing diseases are at greater risk and require a high index of suspicion for serious injury. **If in doubt transport to Trauma Centre.**

Penetrating All penetrating injury (excluding isolated injury to hands or feet)

AND/OR

I INJURIES

Head: Minor head injury with loss of consciousness or amnesic to event with:

- 2 or more vomits or a seizure
- on anticoagulants

Open, depressed skull # or signs of base of skull #.

A decreased LOC is due to traumatic injury, until proven otherwise.

Face: Injury with potential airway risk; severe haemorrhage.

Neck: Swelling, bruising, hoarseness or stridor.

Chest: Severe pain, paradoxical breathing, restraint abrasion/contusion.

Abdomen: Severe pain, rigidity, swelling, pelvic tenderness, restraint/abrasion/contusion.

Limbs: 2 or more proximal long bone #, amputation proximal to digits, ischaemia, degloving injury.

Spinal/Back: Visible deformity.

Burns: Partial or full thickness burns
 Adults > 20% Children >10%, or Burns involving head /neck/face/hands/feet/groin or inhalation injury.
 All circumferential burns or burns in a patient with comorbidities or pregnancy.

AND/OR

S SIGNS AND SYMPTOMS

Airway: at risk, hoarseness, stridor

Breathing: RR < 10 or > 29, SpO2 < 90% on air, cyanosis or respiratory difficulty

Circulation: HR >120, SBP < 90 or severe haemorrhage

Disability: GCS ≤ 13 or paralysis/sensory deficit
 Or any worsening trend in ABCD

Paediatrics:
 Physiological changes are late indicators of serious injury in a child whom may lose 30% blood volume prior to ANY changes in vital signs. The following are a guide:

	1st Year	1-5yrs	6-12yrs
HR	> 160	> 140	> 120
SBP	< 60	< 70	< 80
RR	> 60	> 35	> 30

T TRANSPORT

If patient meets Major Trauma Criteria they are to be transported to the highest level Trauma Centre within a 1 hour travel time or Aeromedical Retrieval Service advised.

From NSW Department of Health, Selected Specialty and Statewide Services Plans. (2009)
<http://internal.health.nsw.gov.au/policy/ssdb/publicat/traumaservices.pdf>

Patients who have sustained trauma, but do not have 'major trauma criteria', may have serious injuries. In some cases these patients may be triaged to the waiting room.

In an Australian prospective study of trauma calling criteria, 3% of patients with trauma were found to be under-triaged, using a two tiered trauma calling criteria, with no reported deaths in that group (Davis et al 2010). A retrospective study at a second trauma centre in Australia found an under triage rate of 42% and over triage rate of 21% in the use of a 2 tier trauma call system. Those more likely to be under triaged were patients who were older, self-presented, their cause of injury was assault or their head or chest were the most severely injured body region. These patients also had a longer length of stay in the ED (Curtis et al. 2010).

A United States (US) trauma hospital found that the trauma call criteria based on MIST was effective, but not perfect. 0.5% of patients triaged as minor required potentially limb or life saving operations, 0.1% required intubation and 0.1% died. The deaths were in patients who arrived alert and awake and physiologically stable. High risk groups were patients with progressive brain injury, blunt abdominal trauma, and patients with pre-existing illnesses (Kouzminova, Shatney, Palm, McCullough, & Sherck 2009).

Patients who were discharged following trauma call activation (30% of trauma activations) at an Australian trauma centre were surveyed following discharge, to determine their ongoing care needs and satisfaction with the service (Au & Holdgate 2010). A small number of patients had missed injuries that were quite significant. Knowing that even with trauma team activation significant injuries may be missed; it is not implausible that a patient triaged to the waiting room may also have occult, progressing injuries.

The consequences of missing injuries can be serious for the patient. The CIN who has a raised index of suspicion and an awareness of the higher risk groups will be well armed to detect occult or worsening injuries.

High Risk Groups

The Elderly

Most injuries occur in young adults ie the 15–24 age groups, mainly male, being considered as the greater risk takers. However, patients over the age of 55 with co-morbidities and taking anticoagulants and/or antihypertensives, who sustain the same type of injuries as the younger age group, have poorer outcomes (Scheetz, 2004, Lawson & Richmond 2005). Death rates from injuries are highest in the 70+ age group (Urden, Stacey & Lough 2002)

The ageing process results in decreased muscle mass and an increased proportion of body fat to muscle. When subjected to trauma internal organs are poorly protected and vulnerable to damage. A combination of muscular atrophy, bone decalcification, and tendon shrinkage results in the elderly being more susceptible to fractures and delayed healing. Respiratory compromise results from reduced chest wall flexibility, calcium deposits in the ribs and kyphosis of the spine from changes in cartilage and bones. These, combined with weakened intercostal muscles (that have to lift these inflexible rigged bones), make the elderly very susceptible to hypoxia during stress in trauma (Urden, Stacey & Lough 2002). The elderly cardiovascular system is compromised as the heart's contractility is decreased, resulting in a reduced cardiac output. Changes in collagen result in stiffening of arteries and an increase in peripheral resistance. As demand increases, such as in trauma, there is a delayed ability to increase blood flow to vital organs and tissues. This combined with the respiratory complications mentioned above, results in rapidly occurring tissue hypoxia.

The shrinkage in elderly patients' brain means that slow bleeding (such as in subdural haematoma) may result in slow and subtle changes to their neurological function (Birnbaumer 2010).

Metabolism of drugs in elderly people is 1/2 to 2/3 less than the rate of younger adults, resulting in an increased drug half-life. Prolonged metabolism is due to slowed absorption and gastric emptying, and reduced nephron function. Increased half-life occurs as a result.

Elderly patients may be on multiple medications, perhaps of most concern to the Emergency Department (ED) nurse are non-steroidal anti-inflammatory drugs (NSAIDs), salicylates, warfarin and beta blockers (Birnbaumer 2010).

Infants and children

Children have a larger body mass-to-surface area ratio and do not tolerate high impact injuries.

The insult of injury combined with their limited ability to compensate for blood loss puts them in a high risk category at triage; and they risk further deterioration in the waiting room.

Patients with mild head injury

It is not uncommon for the patient under the influence of alcohol or drugs to present with a minor head injury. Symptoms can be masked or confused with the effects of alcohol or substances. If these patients are in the waiting room, the CIN must ensure regular review of the patient and escalation of any detected changes in neurological function or vital signs.

Patients who present to triage reporting a head injury greater than 24 hours previously, and have any of the following are to be observed closely and have regular neurological observations attended:

- excessive drowsiness or lethargy
- confusion or disorientation
- abnormal behaviour or irritability
- fitting or seizures
- blurred vision or slurred speech
- severe headache
- persistent vomiting
- abnormal clumsiness.

Presentations that may have sustained spinal injuries

Numerous prospective and retrospective cohort studies have shown that cervical spine injuries occur in 2.0-6.6% of blunt trauma patients, with the co-existence of head injury increasing the incidence of cervical injury (Demetriades, Charalambides, and Chahwan et al. 2000).

Missed or delayed diagnosis of cervical spine injury occurs in 4-8% of patients. Of the patients with missed or delayed diagnosis of cervical spine injury, 70% have altered levels of consciousness.

A controversial issue at triage or in the waiting rooms is the management of suspected neck injuries that self present.

The CIN should be guided by the use of an evidence based guideline. These include; The Canadian C-Spine (cervical-spine) Rule and NEXUS (National Emergency X-Radiography Utilization Study) (Ackland 2009)

Patients who have sustained blunt trauma

Blunt trauma accounts for 85-90% of all traumas in Australia. In the patient with blunt trauma, injuries may evolve over a period of time. The patient who presented with, what at first seemed a minor injury; such as an isolated rib or limb injury, occasionally goes on to develop more serious injuries.

The CIN is in a prime position to recognise evolving injuries by:

- Having a clear understanding of the mechanism of injury, eg type of impact and body areas involved
- The risk factors for the patient, eg co morbidities, age, medications
- Changes in clinical symptoms
- Evolving or unresolved pain.

Eye Injuries

Care of the patient who has sustained an eye injury is well guided by the Emergency Eye Book which is available in book form for EDs and on CIAP at:

http://www.health.nsw.gov.au/resources/gmct/ophthalmology/eye_manual_pdf.asp

The Focused Assessment

Using a standardised approach to assessing the trauma patient (primary and secondary survey) may seem overzealous in the case of minor trauma, but it is well supported by evidence and has been shown to reduce the incidence of missed injuries (Gross & Martel 2010). Refer to an Emergency or Trauma text for further information on the components of the primary and secondary survey.

Communication and Escalation of Patient Care

ISBAR (see below) is the preferred communication tool for handover and escalation of care (DETECT). In the learning activities ISBAR is used to present a case study.

Key Points

- At risk groups include:
 - Patients >55 years old with co-morbidities
 - Any elderly person >65 years old
 - Infants & children
 - Patients with blunt trauma including sports injuries
 - Patients with minor head injury, particularly with alcohol or substance ingestion
 - Patients with significant mechanisms of injury.
 - Triage is a continuous process and close observation of “at risk groups” is an important role of the CIN
 - Conducting a focused assessment is vital to detect at risk ‘red flags’ in minor trauma.
-

Learning Activities

Complete the learning activities in the CIN Participant Manual.

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Further Resources/Reading

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2.3 Care of the Patient with a Possible Sepsis Presentation

Statement of Purpose

The aim of this module is to emphasise the importance of early recognition and prompt treatment of undifferentiated emergency patients presenting with sepsis or developing sepsis. It is aimed at enabling the CIN to recognise the patient with suspected sepsis in the waiting room and anticipate and escalate care as required.

Learning Outcomes

At the completion of this module the CIN will be able to:

- Discuss the importance of early recognition and management of sepsis to patient outcome
- Outline strategies to improve the recognition and management of sepsis
- Examine the treatment modalities, patient outcome measures and clinical indicators for sepsis
- Analyse the CIN role in detecting and responding to clinical deterioration of a patient with possible sepsis in the waiting room.

Background

Sepsis and septic shock are life threatening conditions, which may be difficult to diagnose. This poses challenges for clinicians as the early recognition and management of sepsis is crucial because it has a significant impact on the long term outcomes for patients in terms of morbidity and mortality. Recent literature suggests that sepsis and septic shock has an estimated mortality rate in ICU of 27.6% (ARISE 2007). A project titled 'Improving the recognition and management of sepsis' conducted by the NSW Agency for Clinical Innovation and the Clinical Excellence Commission identified many areas of improvement required in the management of sepsis and septic shock. Firstly it established that the average time to antibiotics in ED is too long at 4.45 hours. It also found that the sepsis was the number one reason for initiating a MET/PACE call in the deteriorating patient.

Identification of Sepsis

The first most important step is the recognition of sepsis.

Recognition of sepsis involves the following:

1 Identify patients in high risk groups, which include:

- patients aged over 70 years
- infants and young children
- immunosuppressed patients (oncology, splenectomy) or those who have an existing chronic medical condition.
- Patients may display subtle or non specific signs of sepsis – they may look well
- If a patient looks unwell or you are worried about a patient it is important to**THINK SEPSIS.**

2 History and examination

Subjective assessment identifies if the patient has any possible source of infection by questioning about the following in the initial assessment:

- Urine dysuria or frequency
- Chest cough or shortness of breath
- Skin cellulitis, wound, recent surgery, procedure
- Headache, neck stiffness, photophobia
- History of fever or rigors
- Abdominal pain
- Recent surgery.

3 Objective assessment involves assessment of vital signs

- Any patient with an infectious process has the potential to become septic. Infection triggers the release of cytokines and other inflammatory processes. This is called systemic inflammatory response syndrome (SIRS). Alterations in vital signs parameters (respiratory rate, oxygen saturation, heart rate and temperature) will help to identify signs of SIRS. The SIRS criteria is listed in Table 1
- If left unchecked, SIRS triggers the clotting cascade which triggers a complex series of events, resulting in a cardiovascular insufficiency, increased metabolic demands, and decreased oxygen delivery
- This results in hypoperfusion of the vital organs. The objective signs of hypoperfusion are hypotension (Systolic blood pressure < 90 mmHg) and/or elevated serum lactate level (Serum Lactate level 4mmol/L or greater).

Table 1: SIRS criteria

The patient must be suspected of having SIRS if they display 2 or more of the following (as acute changes):

- **Temperature > 38°C or <36°C**
- **Heart rate >90/min (Adults)**
- **Respiratory rate > 20/min or PaCo₂ < 32mmHg**
- **WCC > 12 or <4 or > 10% immature bands.**

Definition of sepsis

- **Sepsis** has been defined as 2 or more SIRS criteria plus suspected infection, eg UTI, chest infection, wound infection, cannula etc
- **Severe Sepsis** is defined as: Sepsis with organ dysfunction, hypoperfusion or hypotension.

It is important to understand the findings of the vital signs assessment in relation to DETECT criteria. If any of the patient's vital signs are in the Red Zone (Table 2) and there is a possible source of infection this is **SEVERE** sepsis until proven otherwise as it represents signs of hypo perfusion of the vital organs.

Table 2: Rapid response criteria

1. Respirations/min: < 5 OR > 30
2. SpO₂: < 90%
3. Pulse/min: < 40 OR > 140
4. Systolic blood pressure mmHg (SBP): < 90
5. Temperature: < 35.50c OR > 38.50c
6. Altered mental state or drowsiness.

If any of the patient's vital signs are in the Yellow Zone (Table 3) and there is a possible source of infection they are at risk of moving further towards severe sepsis and intervention is required to reduce the possibility of this event.

Table 3: Clinical review criteria

1. Respirations/min: < 10 OR > 25
2. SpO₂: < 95%
3. Temperature: < 35.50c OR > 38.50c
4. Pulse/min: < 50 OR > 120
5. Systolic blood pressure mmHg (SBP): < 100
6. Altered mental state or drowsiness.

Red Flags

If the patient is in a high risk group with vital signs in the Yellow Zone it is imperative to treat this patient as potentially having severe sepsis.

Response and escalation

If sepsis has been identified the next important step for the CIN is to respond to the identified critically ill patient or the patient with potential for clinical deterioration. The steps outlined (recognition of sepsis plus response and escalation) are time sensitive and should take no longer than 5 minutes. It should involve escalation to a senior medical officer. **Patients with possible severe sepsis must be moved from the waiting room immediately. Transfer to the resuscitation area or equivalent without delay.**

Ongoing management

In circumstances where patients may potentially have early sepsis and are still waiting to be seen, the CIN may consult with the senior medical officer and commence time sensitive investigations, including a septic workup.

- Obtain an infection source history, if possible
- Blood cultures, FBC, LFT, Venous blood gas (with lactate), Coagulation & Glucose should be obtained with an intravenous cannula inserted
- A urine sample and sputum culture should be obtained, as well as cultures from other possible sources of infection: eg indwelling vascular access devices and a chest x-ray
- A lactate level is indicated to help identify severe sepsis. If the lactate level is greater than or equal to 4mmol/L this patient has severe sepsis and needs to be immediately escalated to the care of the senior medical officer and transferred to the resuscitation area.

Ongoing management is not safe in the waiting room; hence all steps must be taken to transfer the patient into an acute bed space.

- Patients with a moderately elevated serum lactate require urgent review.

Treatment required

- Intravenous fluids should be commenced
- An accurate intake and output chart is imperative to the good nursing care of this patient
- As soon as a potential source of infection is identified, appropriate antibiotics should be administered. Ideally, the potential sources of infection are collected prior to the administration of antibiotics to ensure proper treatment of the infection, but the key to combating sepsis is rapid administration of antibiotics. Studies by Kumar et al. (2006) have shown that for every hour that antibiotics are delayed, survival decreases by 7.6%.

The CIN may play a vital role in this regard by advocating for antibiotic therapy within 1 hour when sepsis is suspected.

Red Flags

Septic patients often present hypothermic with normal or low white blood cell counts (particularly elderly and paediatric patients). Recognising the potential for infection in the absence of fever and elevated white blood cell count and intervening appropriately are imperative in the treatment and prevention of the progression of sepsis.

Reassessment

Continue to closely monitor patients with potential sepsis if they are in the waiting room. Observations should include MAP as well as blood pressure, pulse, respiratory rate, level of consciousness and temperature. Ensure that the MAP > 65mmHg and oxygen saturation remains above 95%. Minimum requirement for patient monitoring is hourly or more frequently as dictated by the patient's condition.

Maintain a strict fluid balance. Communicate regularly with the ED clinical team and prioritise these patients for transfer into the ED. Inform the patient of what their anticipated emergency journey is and who to contact if they feel unwell or need assistance.

Provide symptom relief for fevers over 38.5 Celsius with paracetamol and ensure that the patient has access to extra blankets etc, if required while waiting in the waiting room.

Learning Activity

Complete the learning activity in the CIN Participant Manual.

Key Points

- Sepsis and septic shock are life threatening conditions
 - Early recognition and treatment of sepsis in the undifferentiated patient has a significant impact on patient outcome
 - Signs of sepsis are subtle and non specific:
 - Patient may be hypothermic
 - Patient may have a normal or low white cell count.
 - Know the high risk groups:
 - Aged over 70 years
 - Infants and young children
 - Immunosuppression
 - Chronic condition.
 - Recognising sepsis involves the following:
 - Identify possible source of infection
 - Look for signs of systemic inflammatory response syndrome (SIRS) Respiratory rate, heart rate and temperature
 - Assess for hypoperfusion which is evidence by hypotension or elevated serum lactate level.
 - Respond and escalate when there is an identified potential for deterioration in a patient
 - Sepsis management is time sensitive with time to first antibiotic 1 hour.
-

Further Resources/Reading

PowerPoint presentation titled 'Sepsis'.

Classens Y. E. Dhainaut J-F. Diagnosis and Treatment of Sepsis. Critical Care 2007, 11 (Suppl 5):2.

Kumar, A et al Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock, Critical Care med 2006 Vol 34 No 6 1589-1596.

Hicks P Cooper, D (on behalf of the ANZICS Board and ANZICS Clinical Trials Committee) The Surviving Sepsis Campaign: International Guidelines for management of severe sepsis and septic shock: 2008 and the Australian and New Zealand Intensive Care Society, Critical Care and Resuscitation, Volume 10 Number 1 March 2008 6-8.

2.4 Care of the Patient with Drug and Alcohol Related Presentation

Statement of Purpose

The aim of this module is to emphasise the needs and issues of patients that may present with drug and /or alcohol related dependencies. This will enable the CIN to develop a plan for assessment and management of this patient population while they await definitive care, and escalate care as required.

Learning Outcomes

At the completion of this module the participant will be able to:

- Identify common symptoms of drug and alcohol intoxication and withdrawal
- Identify the assessment criteria specific to the drug alcohol presentation
- List skills used to monitor the patient in the waiting room
- Outline the 'red flags' that require escalation for the patient with a drug and / or alcohol related presentation.

Background

People with drug or alcohol problems can present to the ED for primary or secondary reasons. The presentation may be the result of a trauma or assault, routine care for medical problems such as collapse, decreased level of consciousness, abdominal pain, behavioural problems, or request for detoxification. Alcohol, tobacco and other drugs (ATOD) are commonly used drugs and are most likely to cause serious injuries, acute and chronic illness and death, whilst illicit drugs cause fewer deaths and health problems overall (De Crespigny & Farquhar 2007). All of these presentations can be a challenge for the emergency nurse and timely screening and assessment are crucial to making an accurate diagnosis and delivering the appropriate medical and nursing care.

The role of the CIN in this context is to be constantly vigilant to the effects of drug withdrawal or overdose and institute monitoring measures that enable the patient to be safely kept in the waiting room while waiting for definitive care. The aim is to safely monitor patients in the waiting room and to be vigilant for conditions that mimic intoxication or withdrawal and disguise an acute injury or medical condition. The intoxication or withdrawal may complicate another serious condition (De Crespigny & Farquhar 2007).

Screening for Risk

In order to identify any patient who is at risk from immediate or longer-term withdrawal, the first step is to screen for patterns of use and risk of harm. To do this you need to use a valid reliable screening tool that is easy to use and not time consuming. You should refer to your local policies and guidelines for tools used to achieve this or contact your local drug and alcohol liaison person for further information on screening tools. As the CIN you are responsible for assessing the level of risk to the patient, family, other waiting room patients and emergency staff based on the patient's physical and behavioural symptoms. Do not leave a patient in the waiting room that is at risk of harm to themselves or others.

Drug Intoxication and Withdrawal

Patients present to the ED for withdrawal management with a mixture of attitudes and emotions and some may present in crisis. They may be suspicious of people in positions of authority as a result of previous experiences in a variety of settings, including the healthcare system. The initial assessment is an important opportunity to begin building an effective therapeutic relationship with the patient (Drug and Alcohol Withdrawal Clinical Practice Guidelines, 2008)

- Be non-judgemental, empathic and respectful
- Listen and clearly elucidate the patient's needs
- Encourage the patient to participate actively in treatment decisions from the outset
- Communicate clearly, and allow time for the patient to gain an understanding of what assistance is being offered and the reasoning behind it.

Key Point

- It is common for drug-dependent people to present in a state of intoxication (which can complicate assessment and management of withdrawal) or overdose (which can be life-threatening). Both intoxication and overdose may require acute medical care.
-

Nursing Assessment

The following key elements must be clarified with each patient as part of the drug and alcohol use assessment:

- type of drug
- route of administration
- frequency of use
- dose
- duration of use
- time and amount of the last dose, eg grams of alcohol, mls and mgs of methadone, grams of cannabis, etc.

Key Point

- It is important to ask the person if they are using more than one drug at a time, as polydrug use can significantly increase the risk involved.
-

Physical Assessment

The physical assessment involves; a full set of vital signs, fluid balance, level of consciousness, with particular attention to blood pressure and pulse. Below are some examples of physical signs arising from drug and alcohol use:

Signs of drug use administration

- puncture marks
- cellulitis
- phlebitis
- skin abscesses
- erosion or irritation around nostrils/septum
- irritation or rash around nose and mouth.

Signs of withdrawal

- sweating
- tremor
- agitation
- disturbance of coordination, gait.

Consequences of use

- excessive weight loss
- signs of numerous old injuries, eg bruising
- general physical health problems such as septicaemia
- HIV, hepatitis B/C
- jaundice.

Reference: Nursing & Midwifery Clinical Guidelines - Identifying & Responding to Drug & Alcohol Issues (2008).

The CIN nursing assessment is the first step in managing drug and alcohol withdrawal and the primary aims are to predict the risks that will confront the patient because of withdrawal; identify the specific needs of the patient to enhance the likelihood of completing withdrawal; and begin building a therapeutic relationship with the patient.

Listed below are the components of a comprehensive drug and alcohol assessment. It is not expected that the CIN will undertake such a comprehensive assessment on every patient. The CIN will need to complete and document the sections which allow them to make decisions on patient clinical safety in the waiting room, decide on relevant diagnostics and develop a short term nursing care plan.

Clinicians should:

- take care to ensure that personal values and stereotypes do not interfere with effective assessment of the patient
- explain the purpose of each element of the assessment process to the patient
- seek the active involvement of the patient in planning treatment (short and long term).

Components of a comprehensive assessment:

- Full drug consumption history
- Identifying risks associated with polydrug use
- Identifying past history of withdrawal and any associated complications
- Medical and psychiatric history
- Physical examination

- Mental state examination
- Appropriate laboratory investigations
- Psychosocial assessment to identify expectations, supports, barriers and preferences that may influence withdrawal management (short and long term).
- Formulating a management plan
- Psychosocial assessment may be deferred if the patient is unwell, but it will serve to assist in planning future care and in determining treatment options.

Reference: NSW Health, *Drug and Alcohol Withdrawal Clinical Practice Guidelines, 2008.*

Key Points

Some common tools of assessment you may consider using include:

- Alcohol Withdrawal Scale
- Opioid Withdrawal chart
- Cannabis Withdrawal Scale.

Waiting Room Observations

Where the patient is safe to be left in the waiting room area the CIN must be able to maintain discrete observations of the person ie watch what they are doing and record/report significant changes. You should at regular intervals directly ask the person how they are. You should also observe for early signs and symptoms of acute alcohol or drug withdrawal. As the CIN you should consider escalating care if there is any evidence of increasing behavioural disturbance, intoxication or withdrawal.

Tips for the Waiting Room

- Communicate with patient and family
- Maintain patient privacy and confidentiality
- Manage early signs of withdrawal and escalate care as required
- Communication with other staff - ie triage nurse, NUM/Team Leader, Medical Officers, Drug and Alcohol Liaison.

Signs and Symptoms

The following information describes the most common signs and symptoms of drug intoxication and withdrawal that you should be on the lookout for during your CIN assessment.

1. ALCOHOL	<i>Aka: Grog, piss, booze, sauce, six pack, slabs, long necks, casks</i>
Signs of Intoxication:	Loss of inhibition, exuberance, slurred speech, argumentative, over-friendly, stumbling, alcohol smell, drowsiness, aggression.
Signs of Withdrawal:	Sweat, tremor, hallucination, seizures, delirium
Risks:	Risks increase if used with other drugs especially depressants
Escalate Care:	Decrease in level of consciousness, confused, has perceptual disorders, hallucinations, seizure, aggression or associated hidden injury (eg head injury).

2. BENZODIAZEPINES	ie Diazepam, Alprazolam, Clonazepam, Lorazepam, Nitrazepam, Oxazepam, Temazepam <i>Benzos, rowies, moggies, jack & jills, downers, sleepers, tummies, serries, pills</i>
Signs of Intoxication:	Sleepiness, disinhibition, confusion, slurred speech, lack of coordination, stumbling, drowsiness, headache, confusion, ataxia, dazed look.
Signs of Withdrawal:	Nervousness, tremors, seizures
Risks:	Risks increase if used with other drugs
Escalate Care:	Change or decrease in level of consciousness, seizure, safety concerns with gait.
3. OPIOIDS	ie Buprenorphine, Codeine phosphate, Fentanyl, methadone, Morphine, Oxycodone, <i>Heroin - H, shit, smack, horse, harry, white, skag, junk, slow, rock</i>
Signs of Intoxication:	Emotional detachment, pain relief, comfort, euphoria, pinpoint pupils, drowsy 'nods off', itching, constricted pupils.
Signs of Withdrawal:	Nausea, pain, cramps, diarrhoea, irritability, dilated pupils, extreme agitation.
Risks:	Risks increase if used with other drugs
Escalate Care:	Decrease in level of consciousness, signs of withdrawal.
4. CANNABIS	<i>Marijuana - grass, pot, shit, ganja, mull, hash, durry, green, dope, cone</i>
Signs of Intoxication:	Intoxication, very relaxed, red eyes, silliness, distorted sense of time, giggles, munchies (increased appetite), talkative, sleepiness, disorientation, inability to perform complex tasks, time distortion
Signs of Withdrawal:	Insomnia, shakiness, irritability, restlessness, anxiety, anger, aggression
Risks:	Risks increase if used with other drugs
Escalate Care:	Paranoia symptoms/hallucination/aggression.
5. PSYCHOSTIMULANTS	<i>Cocaine - coke, c, snow, nose candy, okey-doke, crack, free base</i> <i>Amphetamines - speed, gooey, uppers, whiz, velocity, base, paste, wax, pure, point, red liquid speed, liquid red, ox blood, crystal, crystal meth, shabu, yaabaa, point</i>
Signs of Intoxication:	Dilated pupils, increased energy, loss of appetite, hyperactive, very talkative, may be aggressive, hallucinations, drug-induced psychosis, depression and suicidal ideation, exacerbation of mental illness.
Signs of Withdrawal:	Excessive sleep, irritability, delusions and violent behaviour
Risks:	Risks increase if used with other drugs
Escalate Care:	Change in demeanour to include increased aggression, agitation, restlessness, seizure.

▶ **Red Flags**

The CIN must be vigilant of the major risks for drug and alcohol affected patients presenting to the ED and these may include any of the following:

- Potential head injury (cerebral haemorrhage) – any patient who presents as incoherent, disoriented or drowsy should be treated as a head injury until proven otherwise
- Withdrawal: ie decreased level of consciousness, seizures, agitation – deterioration in condition whilst waiting for definitive care
- Suicide risk – does the patient have access to drugs that may result in a potentially lethal or harmful overdose.
- Potential falls risk – other associated injuries
- Potential to leave before medical assessment
- Child Protection and Domestic Violence issues
- Polypharmacy abuse/overdose including paracetamol ie any suspicion of paracetamol or other overdose should be treated as such until proven otherwise.

Key Points

- Patients affected by drugs and/or alcohol need ongoing regular assessment to monitor their condition ie detect deterioration, overdose, withdrawal.
-

Learning Activity

Complete the Case scenario questions in the CIN Participant Manual.

References/Further Resources

DeCrespigny C. & Farquhar S. (2007) Alcohol and Other Drug Use cited in Curtis K, Ramsden C, and Friendship J. Emergency & Trauma Nursing. Elsevier Australia: China.

Mental Health and Drug and Alcohol Office, NSW Health (2008) NSW Drug and Alcohol Withdrawal Clinical Practice Guidelines. Document Number GL2008_011. Publication date 04-Jul-2008.

http://www.health.nsw.gov.au/policies/gl/2008/pdf/GL2008_011.pdf

NSW Health (2008) Nursing & Midwifery Clinical Guidelines - Identifying & Responding to Drug & Alcohol Issues. Document Number GL2008_001. Publication date 07-Jan-2008.

http://www.health.nsw.gov.au/policies/gl/2008/pdf/GL2008_001.pdf

The Drug Offensive (1993) Handbook for Medical Practitioners and other Health Care Workers on Alcohol and other Drug Related Problems. Australian Government Publishing Service, Canberra.

2.5 Care of the Paediatric Patient

Statement of Purpose

The aim of this module is to emphasise the role and responsibilities of the CIN in relation to infants, children, adolescents and their parents/carers in the ED waiting room. In this module child, children or paediatric patients refers to infants, children and adolescents unless otherwise specified and parents also includes carers.

Learning Outcomes

At the completion of this module the participant will be able to:

- Discuss the role and responsibilities of the CIN to the paediatric population
- Recognise the signs of serious illness in children or paediatric red flags
- Initiate treatments/investigations to waiting children
- Identify the common fears for children presenting to the ED
- Appreciate the concerns and anxieties of parents in the ED waiting room.

This module does not aim to replicate information available in established resources for ED nurses such as: Paediatric Clinical Guidelines e-learning package or the Emergency Triage Education Kit (ETEK 2007).

Prerequisite

Prior to completion of this module the CIN participant should have completed 'Recognition of a Sick Child' online learning in the Paediatric Emergency Guidelines Training Menu located at: <http://www.doh.edmore.com.au/login.php>

Background

There are key anatomical, physiological and developmental differences between children and adults. The CIN needs to consider these differences when communicating with children of different ages, during the assessment process and when initiating investigations or treatments.

Childhood illnesses are age specific due to the differences in anatomy, physiology, development and psychology and serious illness often takes time to evolve. Children can compensate for a prolonged period of time before clinically deteriorating but when they do begin to deteriorate it is usually very rapid. The ongoing review of children in the ED waiting room by the CIN is vital so that any clinical deterioration is detected early and appropriate interventions can be provided. Regular ongoing review also provides the opportunity for the CIN to determine whether the child is responding to any treatments that have been initiated.

History Taking

The CIN may need to confirm or elaborate on the presenting triage history prior to initiating any treatments or investigations or reassessing the child in the waiting room. The history is generally elicited from a parent but the CIN may augment the information by questioning the verbal child where appropriate. The clarity of the information gathered from the parents or carers can sometimes be affected by anxiety and distress or sleep deprivation.

Establishing an initial rapport with a child increases the confidence of parents and assists in reducing their fears and anxieties. This allows for the assessment process to be performed in a "safe" non-threatening manner and improves the reliability of the clinical signs (Cameron et al. 2006). Always respect privacy, no matter the age of the child.

Clinical Urgency

The early signs and symptoms of serious illness in children may be subtle and non-specific. A neonate with meningitis may be brought to the ED with a normal or low temperature and a vague history of "not settling as well as normal" and or "not feeding quite as much as usual". These are "red flags" in the paediatric history and in the clinical examination which indicate serious illness or injury or the potential to progress to a life-threatening situation.

▶ Red Flags

There are a number of published lists of red flags in both the presenting history and physical assessment that are predictive of serious illness and injury in children. The Australian Department of Health and Aging Emergency Triage Education Kit (2007) tables the following clinical features as significantly predictive of serious illness in infants and young children and should be considered in the light of history of events and physiological data. Where there are multiple risk factors there is increased risk of serious injury or illness:

- Decreased intake (less than half normal intake in preceding 24 hours)
- Decreased output (less than 4 wet nappies in the preceding 24 hours)
- Breathing difficulty/respiratory disease
- Decreased activity/drowsiness
- Alteration in body temperature ie being pale and hot or hypothermic
- Febrile illness in an infant less than 3 months of age
- Victims of violence eg child at risk, sexual assault, neglect
- Parental Concern.

Other red flags to consider when reviewing children in a waiting room are those that are representing with the same problem, a history of apnoea or seizures, prolonged irritability and any signs of compensated shock (Cameron et al. 2006). Children with co-morbidities also have the potential to deteriorate rapidly. When reviewing a child who has been injured, local protocols for paediatric trauma criteria should be adhered to as there are predictors for high risk of life-threatening injury in children. These predictors include specific clinical parameters, injuries and mechanism of injury (Cameron et al. 2006).

Physical Assessment

Always observe the activity level and interaction between the child and their environment or parent prior to performing a physical examination. Important indicators of serious illness may be noted during the observation. The observation of the general appearance of a child includes noting the level of alertness, eye contact, quality of cry, posture, irritability, colour, hydration, perfusion, growth and nutrition, respiratory distress and the presence of any unusual odours (Cameron et al. 2006).

The primary assessment of a child is the same process for that of an adult however the signs of serious illness or injury will differ because of the differences in anatomy and physiology. The Emergency Triage Education Kit (2007) includes an overview of paediatric triage assessment and highlights red flags that may be noted during the primary assessment.

The CIN must be aware of the early signs of compensated shock in a child and the signs of deteriorating respiratory function as the clinical signs differ from those of adults. Tachycardia, decreased capillary refill, mottled skin, cool peripheries, decreased urine output and drowsiness are all early signs that an infant or child is in a state of compensated shock. The blood pressure will remain normal during the period of compensation. Children with severe or deteriorating respiratory illness will be fatigued.

The time spent in the ED waiting room allows for re-evaluation and observation and can assist in determining whether a child is sick or well. The CIN can identify if the initial abnormal clinical findings are persisting or if there has been a response to interventions. Children can sometimes appear transiently sicker than they really are ie the pale, dehydrated child who initially appears tired may respond to a trial of oral fluids and on reassessment be found to be smiling and playing in the waiting room.

Parents and carers can assist in the ongoing assessment process by distracting and calming their child and by revealing information about what is normal for their child. This information is particularly useful if the child has special needs or a chronic condition. The parents and carers can also determine if their child is improving and responding to treatments initiated by the CIN or if they are deteriorating. The parents and carers have the ability to identify any deviation from normal in their child's functioning and the ability to do this should never be underestimated by the CIN (ETEK 2007).

The CIN should liaise with the triage nurse if a child in the waiting room requires an escalation in care and a change to the allocated triage category. Appropriate nursing and medical personnel should be notified of a change in the acuity of a waiting child within the context of local policies and guidelines.

Treatments and Investigations

The process for initiating treatments and diagnostic investigations in children is the same as for adults. There are a number of treatments and investigations appropriate for children in the waiting room however these should be initiated within the context of state and local guidelines/policies. Repeated exposure to radiation from x-rays in children can have serious consequences so unnecessary x-rays in this population must be avoided.

Examples of treatments and investigations that are appropriate for the paediatric population (CHW CIN Guidelines 2005) may include the following:

- Trial of oral fluids for child with signs of dehydration
- Administration of medications such as antipyretics, analgesics, steroids, bronchodilators and topical anaesthetic
- Fracture management (splinting)
- First aid for burns
- Wound dressings and repair
- Urinalysis
- 12 lead ECG
- X-ray of upper or lower limb
- Distributing fact sheets, head injury cards and providing education

- Referral to subspecialty team
- Reduction of a pulled elbow*
- Gastric tube replacement; gastrostomy tube care*.

* More commonly linked to protocols in paediatric specific EDs.

The need for analgesia in a child is determined by utilising an appropriate paediatric pain assessment tool.

There are a number of pain assessment scales and tools available including ones for neonates, preverbal children and those that are cognitively impaired and non-verbal. Self reporting visual analogue scales can be used for older children to rate their pain. It is important that the CIN reassess the child after initiating any pain relief interventions to determine the effectiveness of the treatment. Refer to module on pain assessment and local protocols for more information on pain management in paediatrics.

Parents are often concerned and anxious about their child while waiting to be seen. The CIN should provide parents with information about the plan of care for their child while they are waiting and also reassure the parents that their child is being observed and will be reassessed as necessary.

There are several factors that influence parental anxiety in the ED and these include the severity and duration of the illness, perceived discomfort and prolonged waiting times for children triaged as non-urgent (Parkinson et al (1999)). Fever is one of the most common presenting complaints for children and often contributes to parental anxiety. (Parkinson et al (1999) describe "fever phobia" as an unrealistic fear of the effects of fever and concluded that parents of children less than two years of age with a fever, had significantly elevated levels of anxiety. The CIN should address the concerns of parents of young febrile children and provide reassurance and fever education where possible, thus reducing anxiety and the potential for challenging communication.

Waiting in the ED can be unfamiliar, stressful and frightening for children so the waiting room should be as relaxed and child friendly as possible. Toys and activities provide a distraction for children while they are waiting and observing a child play will add valuable information about the child's general condition to the CIN's assessment of a child.

Learning Activities

Complete learning activity 1 & 2 in the CIN participant Manual.

Key Points

- The role and accountabilities of the CIN for children in the ED waiting room is the same for those of adults
 - Diseases of childhood are age specific with serious illness often taking time to evolve
 - Infants and young children have the potential to rapidly deteriorate as the early signs of serious illness may be subtle and non-specific and therefore remain unrecognised
 - A number of features of compensated shock and respiratory distress in children differ from those of adults
 - Always consider the child in the context of the family
 - The history is generally elicited from a parent but augment the information by questioning the verbal child where appropriate
 - Initiate treatments and investigations within the framework of local guidelines/policies
 - Consider the chronological and developmental level of a child during interactions and always involve the parent in the assessment process as they are able to identify changes in their child's condition
 - Acknowledge and where possible alleviate the concerns of both the child and parent.
-

References/Further Resources/Reading

Cameron P, Jelinek G, Everitt I, Browne, G, Raftos J, editors (2006) Textbook of Paediatric Emergency Medicine, 1st Ed. Churchill Livingstone, Philadelphia

Australian Government Department of Health and Ageing (2007) Emergency Triage Education Kit, Commonwealth Department of Health and Ageing, Canberra

The Children's Hospital at Westmead (2005) Guidelines for the Role of the CHW ED Clinical Initiatives Nurse (CIN). http://intranet.kids/ou/emergency/resources/triage/cin_role.pdf

Parkinson GW, Gordon KE, Camfield CS, Fitzpatrick EA (1999) Anxiety in Parents of Young Febrile Children in a Paediatric Emergency Department: Why is it elevated? Clinical Paediatrics 38: 219-226

2.6 Care of the Geriatric Patient

Statement of Purpose

The aim of this module is to emphasise the role of CIN in the assessment and management of the elderly patient within the emergency department waiting room. This will enable the CIN to develop an understanding of the specific needs of the elderly patient and their carers, as well as develop plans for their assessment and care initiation in the waiting room.

Learning Outcomes

On completion of this module the participants will be better able to:

- Describe the physiology of ageing
- Discuss the importance of early assessment of the elderly waiting patient
- Identify indicators of urgency for elderly patients
- Outline the importance of teams in caring for the elderly
- Identify the care needs of the elderly patient in the waiting room..

Background

Emergency Departments are difficult and stressful places for vulnerable elderly patients. Hospitals are not designed for complex elderly patients, however elderly patients regularly present to EDs with about one third of all hospital presentations being associated with this age group. This is an ever increasing patient group with the number of people aged 65 years and over in Australia increased by 85,800 people in the 12 months to 30 June 2009. The number of people aged 85 years and over also increased by 21,000 people (5.8%) to reach 383,400 in that time period. Over the past two decades, the number of elderly people increased by 167.8%, compared with a total population growth of 30.1% (Reference: Australian Bureau of Statistics)

Geriatric patients are at significant risk of deterioration due to the following:

- Physiological changes of aging
- Polypharmacy
- Nutritional complications
- Age related disease.

Considering each of these factors and the way the ED service is structured, waiting undifferentiated elderly patients offer many challenge to CINs. Aging progressively changes all body systems and contributes to the elderly person's capacity to respond to, and recover from, illness or injury. Identifying the normal physiological changes associated with aging from the symptoms of a new illness can be difficult but once this information is obtained early detection of risks to the patient's health ensures ongoing assessments and plans of care are appropriate.

What is ageing?

- It is characterised by the progressive loss of bodily and organ function
- It produces decreased functional reserve in times of stress (physical/metabolic)
- People may be chronologically old but remain physically fit, mentally alert and productive in society
 - People may also be chronologically young, but physically or functionally old.

Ageing may produce the changes in the following areas:

- Physical
- Physiological
- Psychosocial.

It is imperative to consider the impact of these changes in the assessment, examination and subsequent management of the elderly patient waiting in ED.

Assessment of the elderly patient

The assessment of the elderly person should be specific to their presenting problem with

The following considerations:

- Predisposing history: Identifying what brought the patient to hospital can provide significant information to aid the clinical assessment of the older patient. For example, a fall in the elderly could be the result of a simple trip or an underlying cardiac event. Understanding the reason for the patients' presentation can obtain important information to inform why the fall occurred, the potential injury they sustained and rate of recovery
- Onset of symptoms: Find out if the problem is new or gradual. For instance, Identifying if a fall was in isolation or whether there were recurrent falls preceding the presentation will help to focus the assessment. This is particularly relevant in the patient who presents with confusion and may help to differentiate between delirium, depression and dementia
- Medical /surgical history: What do we know about this patient that may give us insight into their current state of health and potentially give us clues regarding the current presenting problem?
- Medications: Polypharmacy is a factor specific to this population. Listing/reviewing a patient's medications helps to identify their current health problems and any potential problems related to their medication regime
- Allergies
- Social support: Establish what support network this patient has. Are there problems exacerbated because they have little or no support network? Is there anyone that can provide a further history of their health and current situation or is there someone who can support the patient while they're in the waiting room? These questions will inform your assessment and management of the patient
- Mobility: Document how mobile the patient is on presentation, how safe their gait is and if they use walking aids. This information will help to identify patients who will need assistance while in the waiting room and identify potential 'falls' risk. It is important to orientate the patient to the immediate area and instruct them on how to obtain assistance
- Screen for elderly patients at risk: Incorporate the 'Risk screening' questions into the CIN assessment which may establish the need to refer to Aged Care Services (ASET) early in the patient journey. These questions include the following:
 - Do you live alone?
 - Are you a carer for someone else at home?
 - Do you receive community services?
 - Do you have difficulty with self care (washing/shopping/walking/mobilising out of bed)?
 - Do you take six or more medications per day?
 - Do you have a history of falls?

Specialised Geriatric Teams

Early notification of the speciality geriatric teams in the care of the elderly ED patient has been very effective in providing quality patient care. These teams include the following:

- Aged Care Services Emergency Teams (ASET). These are multidisciplinary teams comprised of health practitioners experienced in aged care
- Aged Care Assessment Team (ACAT). These teams help older people and their carers identify support they require when they are unable to manage at home without assistance.

Clinical example

- Tom is 77 years old and lives at home on his own. Tom is independent in most activities of daily living. His younger brother Jack aged 60 years lives nearby and helps Tom with odd jobs around the house and shopping
- Tom tripped in the kitchen. He was brought into the emergency department by ambulance with a painful swollen left arm. On assessment by the CIN it is established that he is fully alert (GCS 15/15) and clearly recalls the incident in the kitchen. He denied feeling dizzy and felt fine prior to the fall. Observations are within normal limits. Urinalysis and ECG are attended and show no abnormalities. Analgesia is given and reduces his pain score to 2/10. A musculoskeletal assessment of the arm is attended. The findings include obvious deformity of the L wrist with pain on palpation over the distal radius. The limb is neurovascularly intact. No other injuries are found. An x-ray confirms that Tom has fractured his distal radius
- A plaster back slab is applied together with a broad arm sling
- The CIN establishes that Tom's brother has flown interstate this morning for a two week vacation. Tom states that he will be able to cope and is not keen to stay in hospital. However the CIN has established that he has glaucoma. The Aged Care Services Emergency Team (ASET) is contacted by the CIN. Meals on Wheels are arranged for three times a day as well as home help staff who will attend daily to help Tom shower with the plaster cast
- In summary the early identification of needs by the CIN in this clinical example established that Tom was a high risk for discharge and early referral to the speciality geriatric team facilitated Tom's safe discharge home, decreasing the potential for him to represent or have an unnecessary admission and face possible complications.

Key points for the CINS when assessing the elderly patient

- Accurate history taking may be impeded by cognitive and/or sensory impairments. Further information may be needed from family/carers/ GP/witnesses to events
 - Elderly patients may present with non-specific symptoms or signs. Cardiac events may manifest as complaints of weakness, vomiting, dizziness so an ECG should be considered early as an initial investigation
 - Syncope in the elderly has a cardiac origin until proven otherwise
 - Absence of abnormal vital signs does not rule out severe illness, particularly sepsis
 - Elderly patients may be very stoic, and feel anxious about interrupting nurses to ask questions and seek assistance or pain management. The CIN must anticipate this and be proactive in reassessing the elderly patient in the waiting room
 - Elderly patients are more likely to fall. It is imperative to establish the cause of a fall. A fall in association with anticoagulants/thrombolytic medications may be life threatening.
 - The skin of the elderly is more susceptible to pressure care problems, skin tears and heat loss
 - Remember that examination may reveal injuries consistent with abuse/neglect
 - Elderly patients who have sustained a mild head injury (GCS 14) need to be considered 'HIGH RISK'. Cervical spine precautions should also be considered when patients present with simple mechanism of injuries ie fall from standing height/chair
 - Assess for all causes, including organic causes of acute confusion or delirium in the elderly such as hypoxia, hypothermia, CVA & metabolic disorders (diabetes), acute psychosis, drug & alcohol withdrawal, intracranial pathology or early signs of shock/sepsis.
-

Learning Activity

Refer to the CIN Participant Manual and liaise with the facilitator to complete the learning activity.

▶ Red Flags

Assess for potential Red Flags:

- Potential cardiovascular problem
- Potential metabolic problem eg low sugar
- Potential for sepsis
- Potential head injury/cerebral haemorrhage
- Potential chest injury
- Potential social issues.

The following table is a guideline of the important objective assessment that should be attended to in the elderly patient together with the rationale of why it is indicated.

Assess	Rationale
BP (postural), pulse rate and rhythm	Underlying cardiovascular problem
Temperature	Potential for infection/sepsis
Respiratory rate and SaO ₂	Potential chest injury/systematic illness
GCS/PTA	Potential head injury/ potential bleed
Attend ECG	Identify underlying cardiovascular problem
Attend u/a and MSU	Screen for source of infection/sepsis
Attend BSL	Screen for underlying problem
Assess social situation and mobility	Potential issues for management through ED/discharge from ED
Assess pain score	Potential to under report pain which can have significant impact on health status

Further Resources/Reading

Australasian College of Emergency Medicine (2007). Policy on the Care of Elderly Patients in the Emergency Department.

Clinical Excellence Commission and the Centre for Health Advancement, NSW Department of Health (2010).

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2.7 Care of the Pregnant Patient

Statement of Purpose

The aim of this module is to emphasise the importance of observation, review and effective communication with patients who have early pregnancy related presentations and are triaged to the waiting room. This will enable the CIN to recognise 'red flags' in this patient population and plan care for the patient while they are in the waiting room.

Learning Outcomes

At the completion of this module the CIN will be able to:

- Identify the major causes of pregnancy related presentations to ED
- Identify the red flags that require escalation in the patient with pregnancy related presentations
- Outline the psychological needs of the pregnant patient in the waiting room
- Analyse and reflect on the module content by applying learning to 'real life scenarios'.

Introduction

Women with obstetric problems frequently present to emergency departments. In many instances those with pregnancies > 20wks, who are identified as having a pregnancy related reason for presentation, are referred to maternity units. Thus the main focus of this module is early pregnancy. However it is imperative that the ED nurse be aware of possible major complications of late pregnancy which may cause the woman to present with 'vague' symptoms including headache, heartburn and visual disturbances which may indicate serious complications.

The pregnant patient may present with signs and symptoms commonly associated with an undiagnosed pregnancy, or with signs and symptoms associated with the complications of pregnancy (Morrison 2009). The pregnant patient may also require emergency care for a chronic illness that has been exacerbated by pregnancy (Morrison, 2009). An excellent guide for CINs and Triage nurses is the 'Maternity Emergency Guidelines for Registered Nurses' (2007), a resource which has been made available by NSW Health to all EDs.

Obstetric presentations may pose a significant challenge for the emergency nurse. Women may not seek care or, despite presenting to emergency, may be embarrassed about symptoms. Ensuring privacy and culturally sensitive care is fundamental.

Key Points

- An important principle of the ED evaluation is that any female patient of childbearing age should be assumed to be pregnant. A significant number of women with abdominal pain or vaginal bleeding have a positive result on pregnancy testing even when they have stated that there is “no chance” that they are pregnant.
- In general, a pregnant patient should be treated and assessed in the same way as all other patients. However, the normal physiologic changes of pregnancy may mask or unmask underlying medical conditions.
- Knowledge of the physiological changes in pregnancy and related complications will aid the CIN in caring for these patients.

Modified from Morrison, W. (2009)

Downloaded from Rosen's Emergency Medicine, December 2010.

<http://www.mdconsult.com/books/page.do?eid=4-u1.0-B978-0-323-05472-0..00175-4--s0140&isbn=978-0-323-05472-0&type=bookPage§ionEid=4-u1.0-B978-0-323-05472-0..00175-4--s0140&uniqId=231249851-5#4-u1.0-B978-0-323-05472-0..00175-4--s0140>

Bleeding in Early Pregnancy

Problems associated with early pregnancy accounted for 11,254 presentations to NSW EDs in 2006-07. Of these, 9,536 related to miscarriage or threatened miscarriage, representing 84.8 per cent of the total (Hughes & Walters 2007). These problems are associated with a range of clinical conditions, including ectopic pregnancy, complications following abortion, spontaneous miscarriage and threatened miscarriage. Spontaneous miscarriage is common in pregnancy affecting up to 25-30% of detectable pregnancies.

Many of these women spend time in waiting rooms, and the CIN plays a key role in their ED care and experience. It is acknowledged widely, in research and patient care reviews, that the nursing care for patients with these presentations must be attentive to the physical and emotional needs of the patient.

For further information on the assessment of the patient with bleeding in early pregnancy, refer to the Maternity Emergency Guidelines for Registered Nurses' (2007) which have been distributed to all EDs. It is imperative that consideration be paid to the possibility of the patient having an ectopic pregnancy which constitutes a medical emergency.

▶ Red Flags

- Abdominal Pain – severe, peritoneal and constant (however, cannot rule out if mild and crampy)
- Shoulder tip pain
- PV Bleeding
- Signs of hypovolaemic shock.

*** Ectopic pregnancy may occur before the patient knows she is pregnant, thus an index of suspicion is required.**

Risk Factors for Ectopic Pregnancy

- Tubal surgery (for tubal sterilization or ectopic pregnancy)
- Pelvic inflammatory disease
- Smoking
- Advanced age
- Prior spontaneous abortion
- Medically induced abortion
- History of infertility
- Intrauterine device.

Modified from Bouyer J, et al: Risk factors for ectopic pregnancy: A comprehensive analysis based on a large case-control, population-based study in France. *Am J Epidemiol* 157:185, 2003.

Downloaded from Rosen's Emergency Medicine, December 2010.

<http://www.mdconsult.com/books/page.do?eid=4-u1.0-B978-0-323-05472-0..00176-6--s0015&isbn=978-0-323-05472-0&type=bookPage§ionEid=4-u1.0-B978-0-323-05472-0..00176-6--s0015&uniqlid=231249851-5#4-u1.0-B978-0-323-05472-0..00176-6--s0015>

As well as timely access to clinical care, patients with bleeding in early pregnancy require timely psychosocial support. The assessment of the emotional support needs of the patient is important. Such needs are not related to the gestational age of the pregnancy and should be identified in private where possible, to respect the privacy and dignity of the patient.

CINs must be aware of the local protocols which govern the care of patients with PV bleeding in early pregnancy, which may include referral of appropriate patients to Early Pregnancy Assessment Services (EPAS) or Early Pregnancy Units (EPU).

Hughes and Walters (2007) recommended the clinician use the following checklist to guide care of these patients:

- Is the patient being treated with courtesy and respect while she is waiting for treatment?
- Does the patient understand the process for her care, the way in which the hospital will provide that care and how she can have any questions answered?
- Is there capacity for this patient to receive appropriate treatment in the event of any unexpected change in her condition or dramatic increase in ED workloads?

They also stressed the importance of providing fact sheets and the instruction that the patient should contact staff if they felt an urge to attend the toilets.

A review of the patient experience of women who have experience miscarriage, following the implementation of EPAS and EPU has been undertaken by the Clinical Excellence Commission (CEC). Below is a set of recommendations arising from that report, for consideration by the CIN.

"Lengthy waits in the ED have a negative impact on women which can be minimised by four main actions:

- 1) *That a nurse quickly acknowledges the woman's presence and triages appropriately*
- 2) *That a nurse checks on the woman regularly and often*
- 3) *That all staff demonstrate genuine kindness towards the woman and her partner*
- 4) *That practical help with sanitary pads and access to shower/bathroom to clean up is provided."*

Additionally several comments from women who took part in the CEC research are listed below. They qualify the impact of care in ED on the patient experience:

Patient quotes – what contributed to positive experiences?

“I had a miscarriage about five years ago and the treatment back then was horrific as compared to now... this time it was quite nice”

“I remember there were apologies; sorry we had to keep you waiting so long. So the reassurance I would probably rate that quite high to the waiting period which was long”

“The nurse was sensitive to the fact (that I was losing a lot of blood) that she took me to a toilet and I said “I’m really embarrassed that you have to do this (help me clean up) and she said “That’s part of my job. I want to make you feel clean” So yes, she was sensitive to my feelings and loss”.

(Clinical Excellence Commission (CEC) 2011).

Patient quotes – what contributed to negative experiences?

“I would describe the ED staff’s treatment of me as rather cold. I was treated like a problem to just go and sit down and wait until you were told something which wasn’t good. I was feeling really panicked and worried”

“One of the ED nurses asked me why I was so worried and she said that she was paid to worry for me and if she wasn’t worried then I didn’t need to be. It just made me feel I was being told to just shut up and not worry about anything because she wasn’t concerned and therefore I didn’t have a right to be asking questions or feeling the way I did and that made me feel really bad”.

(Clinical Excellence Commission (CEC) 2011).

Comments regarding the provision of literature /information

“The literature the ED nurse gave me was helpful, really nice and comforting”

“The Triage Nurse gave me a sheet on miscarriages and things like that”

“I was not given any written information or pamphlets about miscarriage before I left the ED”

“We were not given any brochures or information to read apart from some information, very brief, on the appointment sheet as to why some women miscarry early and that was basically it. There was nothing about what to expect if I miscarried at home and who to contact if that happened”.

(Clinical Excellence Commission (CEC) 2011).

Learning Activity 1

Complete the learning activity in the CIN Participant Manual.

Other Pregnancy Related Presentations

Hypertension in Pregnancy

Hypertension is observed in less than 10% of pregnancies and is divided into the following categories.

- 1) Gestational hypertension, which occurs during pregnancy resolves during the postpartum period.
It is defined by a new blood pressure reading of 140/90 mm Hg or higher
- 2) Preeclampsia is gestational hypertension with proteinuria
- 3) Eclampsia is the occurrence of seizures in the patient with preeclampsia. This is a life threatening complication of pregnancy.

Risk Factors include (but are not limited to):

- women younger than 20 years
- primigravidas (1st pregnancy)
- twin or molar pregnancies
- hypercholesterolemia,
- pregestational diabetes, or obesity; and
- a family history of pregnancy-induced hypertension.

Red Flags

Warning signs for development of frank eclampsia include headache, nausea and vomiting, heartburn and visual disturbances

Placental Abruption

Separation of the placenta from the uterine wall may account for approximately 1/3 of episodes of bleeding during the second half of pregnancy. Small amounts of bleeding may be asymptomatic and undetected until delivery. In other instances bleeding may be concealed or apparent and extensive.

Risk Factors include (but are not limited to):

- maternal hypertension and preeclampsia
- increasing maternal age and parity
- a history of:
 - smoking
 - thrombophilia
 - prior miscarriage
 - prior abruptio placenta
 - cocaine use.

Placental separation can also be associated with blunt trauma to the abdomen.

Thromboembolic Disease in Pregnancy

Pregnancy produces a hypercoagulable state. There are increased coagulation factors and stasis as pregnancy progresses as well as significant vascular trauma during delivery. The risk of venous thrombosis increases during pregnancy to five or six times that of nonpregnant women. Although the risk is increased throughout pregnancy, it is highest during the puerperium.

Risk Factors include women who:

- smoke
- are overweight
- are older than 35 years
- have varicose veins
- have a prior superficial venous thrombosis
- deliver prematurely or have postpartum haemorrhage.

Appendicitis

Appendicitis is the most common surgical emergency in pregnant patients. The incidence of appendicitis in pregnant patients is the same as in nonpregnant patients, but delays in diagnosis are not uncommon and can result in perforation and increased risk of foetal and maternal mortality. During the first half of pregnancy, diagnostic findings are usually similar to those in the nonpregnant woman, but the clinical picture becomes harder to diagnose in later pregnancy.

Genitourinary Infections

Urinary tract infections are common in pregnant patients and often asymptomatic. Detection and treatment is important to reduce the risk of pyelonephritis.

Key Points

- The history and the physical examination of the patient with ectopic pregnancy are nonspecific; therefore, it should be considered in ED patients who have abdominal pain or vaginal bleeding and a positive pregnancy test result
- The major conditions associated with vaginal bleeding in the second half of pregnancy include placental abruption and placenta previa.

Modified from Houry, D.E. & Salhi, B.A. (2010).

Downloaded from Rosen's Emergency Medicine, December 2010.

<http://www.mdconsult.com/books/page.do?eid=4-u1.0-B978-0-323-05472-0..00176-6--s0260&isbn=978-0-323-05472-0&type=bookPage§ionEid=4-u1.0-B978-0-323-05472-0..00176-6--s0260&uniqId=231249851-5#4-u1.0-B978-0-323-05472-0..00176-6--s0260>

History Taking and Physical Assessment

History taking must be expanded to include an obstetric history, including the course of previous pregnancies (if relevant) as well as the course of the current pregnancy. Consideration of risk factors, as highlighted should be a priority.

Physical examination should be attended in a position of comfort. This may be enhanced by asking for a urine test prior to laying the patient down (as required). In later pregnancy the patient should not be laying supine, as this can exacerbate hypotension, thus they must be positioned with the pelvis tilted to the left or semi recumbent.

Review of blood loss and pain assessment are key elements when re-assessing a patient with bleeding in early pregnancy to detect requirements for care escalation.

Abdominal assessment will change due to the expansion of the uterus, and can include the observation of foetal movement as well as palpation of fundal height. Auscultation of the foetal heart rate is seen as the 5th vital sign. Assessment, in the patient suspected of having an obstetric related presentation is best performed by those experienced in obstetric assessment.

Further information regarding history taking and physical examination can be found in: 'Maternity Emergency Guidelines for Registered Nurses' (2007), or an emergency nursing or medical text.

Key Points

- All woman of child bearing age who present to an emergency department should be considered pregnant until proven otherwise
 - Decision making should be based on the assessment of both the mother and the foetus
 - Hypertension is an ominous sign and requires urgent medical review
 - Presentations may be related to concerns regarding the normal changes or progression of pregnancy
 - The physiological and anatomical changes that occur in pregnancy predispose the pregnant woman to a number of complications
 - The emotional and educational needs of the patient need to be considered and managed to ensure good patient care.
-

Learning Activity 2

Complete the learning activity in the CIN Participant Manual.

References/Further Resources/Reading

NSW Midwives Association (2007) Maternity Emergency Guidelines for Registered Nurses. 3rd edition. Glebe.

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Hughes C. & Walters W. (2007) Report of Inquiry Into the Care of a Patient with Threatened Miscarriage at Royal North Shore Hospital on 25 September 2007. Downloaded December 2010 from http://www.health.nsw.gov.au/pubs/2007/inquiry_rnsh.html

Clinical Excellence Commission (CEC) 2011. Women's experience of early pregnancy care in five emergency departments in Hunter New England Area Health Service.

Maternity - Early Pregnancy Complications Document Number PD2009_058. Downloaded December 2010 http://www.health.nsw.gov.au/policies/pd/2009/PD2009_058.html

Section 3

3.1 CIN Documentation

Statement of Purpose

The aim of this module is to emphasise the importance of nursing documentation whilst working in the CIN role and clarify the documentation requirements for the CIN.

Learning Outcomes

At the completion of this module the participant will be able to:

- Identify the reasons for documentation in the health care setting and CIN role
- Discuss the medico legal aspects surrounding documentation
- Discuss strategies and identify various methods of documenting a CIN assessment
- Analyse and reflect on CIN documentation requirements in their own health care institution.

Reasons for documentation

To facilitate communication amongst health care workers

The delivery of health care is a complex process with the potential for a significant number of individual clinicians to be involved in the patients care. There is not always the opportunity to communicate with each health care worker/team face to face. Documentation (either electronic or written) can provide an effective tool to facilitate communication amongst health care workers and delivers coordinated care to the patient.

To meet legal and professional obligations/standards

Accurate and effective documentation in relation to clinical care delivery is mandated by the following legal and professional obligation/standards:

- ANMC (2008) – Code of Ethics for Nurses in Australia
- ANMC (2008) – Code of Conduct for Nurses In Australia
- ANMC (2008) – Competency Standards for the Registered Nurse
- Nurses and Midwives Act 1991
- Civil Law (Civil Liability Act 2002)
- Poisons and Therapeutic Goods Act (1966)
- NSW Health PD2005_127 Principles for Creation, Management, Storage and Disposal of Health Care Records
- NSW Health PD2007_077 Medication Handling in NSW Public Hospitals
- NSW Health PD2010_075 Emergency Department Patients Awaiting Care
- Local Health Network Policy and Procedures.

To promote good clinical care

NSW Health PD2005_127 Principles for Creation, Management, Storage and Disposal of Health Care Records states the purpose of documentation and subsequent creation of health care record is to:

“provide effective communication to the health care team; provide for a person's effective, continuing care; enable the evaluation of a person's progress and health outcome; and, retain its integrity over time.”

Medico legal Obligations

NSW Nurses Association (2007) guideline on documentation states that although the health care record is not a legal document, the health care record has the potential to be admitted into evidence in legal proceedings of either a civil or criminal nature. Nurses are considered accountable for the care that they provide and therefore:

“Clear, relevant and accurate documentation is an essential component of nurses' and midwives' accountability and provides a mechanism for nurses and midwives to account for their professional actions.”

When a nurse enters a therapeutic relationship with a patient (ie accepts care of the patient) they are accountable under a duty of care. A duty of care can be defined as a legal obligation imposed on nurses to ensure that they adhere to delivering what is considered a reasonable standard of care. Reasonable is defined as care that any equivalent clinician would deliver under those circumstances. Staunton and Chiarella (2008) further explain that a duty of care extends to “acts or omissions which can be complained of” therefore nurses can be considered liable and accountable for failing or omitting to do a particular act.

NSW Health PD2005_127 Principles for Creation, Management, Storage and Disposal of Health Care Records outlines the minimum documentation requirements for a health care record:

- Records are clearly identified as relating to a particular person by detailing, at a minimum, their first name, family name, date of birth and medical record number, as per individual facility policy
- Each entry is signed by persons authorised by the facility and their designation stated. The name of the author is clearly identifiable. In a computerised system, this may require the use of an appropriate identification system eg electronic signature
- Entries should be made in such a way that they cannot be erased
- In the case of electronic data a secure physical and electronic environment should be maintained by the use of authorised passwords, screen savers and audit trails
- The entry is legible and in English
- The year, date and time appears on each entry. When an entry is made after an ‘event’ consultation etc, there should also be a note of the time the event occurred
- All errors are appropriately corrected. An original incorrect entry should remain readable. An accepted method of correction is, to draw a line through the incorrect entry, and initial the correction. No alteration and correction of records is to render illegible information that is already contained in the record. This also applies to electronic entries
- Documentation occurs as sequential reports, with no space between each entry
- The only abbreviations and symbols used in reports are those endorsed and published by the authorised facility/service committee
- The frequency of entry in an individual's health care record is in line with the policy
- Where students are involved in care and treatment of a patient the entry must be co-signed by the supervising professional according to Health Service Policy.

NSW Nurses Association (2007) documentation guidelines provide the following advice that nurses should:

Document FACT

- Fact is what the nurse or midwife saw, heard or did in relation to the patient's care and condition
- Nurses and midwives should avoid non-committal documentation, for example the use of words such as appears or seems, which do not reflect factual documentation
- Documentation should be objective and not subjective and emotive.

Document CONTEMPORANEOUSLY

- Nurses and midwives should record entries in the patient's notes as soon as possible after the events to which reference is being made have occurred, with the date and time for each entry recorded.

Documentation Mediums

There are a number of mediums in which the CIN assessment may be documented and these may include but are not limited to:

- Electronic Medical Record eg:
 - First Net
 - EDIS
 - IPIMs
 - Radiology/Pathology Systems.
- Completion of a CIN form/template
- Written assessment in the patient's Emergency Department notes.

It is the responsibility of the CIN to ensure that they are aware of the required medium for CIN documentation in their health care facility and comply with local policy, procedure and guidelines.

Documentation Tools

There are many ways to document your nursing assessment:

- Narrative reports
- SOAP notes
- SODAF notes
- ISBAR
- Systems Assessment
- ABCDE
- Electronic templates.

Each format has its advantages and disadvantages. The important thing is that you document all information in accordance with your local policy and procedure.

Narrative Reports

- Traditional way nurses have been taught to document
- Usually in paragraph form that tells a story of the patient
- Good for describing brief interactions or conversations with the patient or other health care providers
- Cumbersome when used for writing a succinct clinical assessment.

SOAP Documentation

The four components of a SOAP note are Subjective, Objective, Assessment, and Plan. The length and focus of each component of a SOAP note varies depending on the patients presentation

SUBJECTIVE + STORY	This is what the patient tells you; what they think their problem is & history of illness/injury.
OBJECTIVE + OBSERVATIONS	What we can see or measure, for example, what someone looks like and what their vital signs are.
ASSESSMENT	Clinical assessment and what we think the problem is or a provisional/working diagnosis.
PLAN	A plan of action based on the information gathered.

SODAF Documentation

SODAF is the acronym for Subjective, Objective, Diagnosis, Actions & Follow Up.

SUBJECTIVE + STORY	This is what the patient tells you; what they think their problem is & history of illness/injury.
OBJECTIVE + OBSERVATIONS	What we can see or measure, for example, what someone looks like and what their vital signs are.
DIAGNOSIS	What we think the problem is or a provisional/working diagnosis.
ACTIONS	A plan of management, including any treatment given.
FOLLOW UP	The outcome of treatment and/or ongoing management for this attendance.

Reference: Centre for Remote Health (2008) CARPA Standard Treatment Manual 4th Edition.

ISBAR

ISBAR is the acronym for Introduction, Situation, Background, Assessment and Recommendation. It is one of the most commonly used acronyms for patient handover and documentation.

INTRODUCTION	Identify yourself, your role & location.
SITUATION	Patient name and age. What has brought the patient to ED.
BACKGROUND	History of events leading up to presentation. Significant medical history and allergy status.
ASSESSMENT	Assessment findings and vital signs.
RECOMMENDATION	Recommended plan of care/actions taken.

Reference: Haig KM (2006) SBAR: A shared model for improving communication between clinicians. Joint Commission Journal on Quality and Patient Safety 32(3) 167-75.

Systems Assessment “Head to Toe”

What is documented on each system, will be dependent on the level of assessment conducted in relation to the presenting problem and may include any of the following:

- Vital Signs
- Neurological
- Cardiovascular
- Respiratory
- Renal
- GIT
- Integumentary
- Endocrine
- Psychosocial
- Activities of Daily Living (ADL).

ABCDE assessment

ABCDE is an easy to use format that focuses on documentation of clinical assessment. Its format provides limited opportunity to document the history of the presenting illness.

AIRWAY

BREATHING

CIRCULATION

DISABILITY

EXPOSURE

Clinician's may use an additional tool such as AMPLE to assist with documenting history.

AMPLE

ALLERGIES

Food/latex/medications.

MEDICATION

Taken regularly and for current symptoms.

PAST HISTORY

Past medical/surgical history.

LAST ATE/DRANK

Nil by mouth (NBM) since what time.

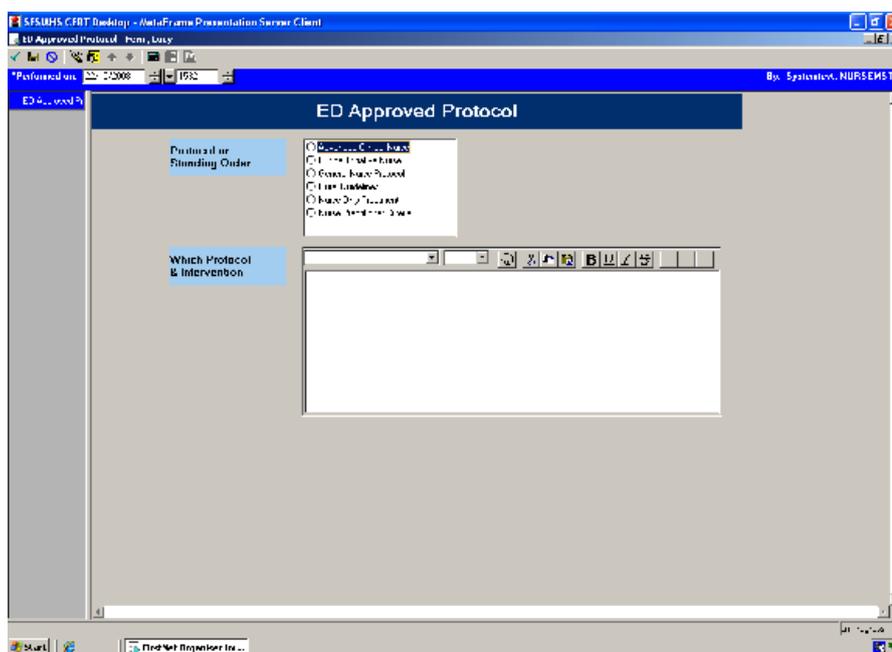
EVENTS

The history behind why the patient has presented to ED.

Electronic Template

Systems such as First Net or IPIMs have inbuilt CIN templates which you must complete, there may be minor variations at individual sites (Figure 1).

Figure 1 *Example of an electronic template*



Certain fields may be considered mandatory and will not allow you to progress until information is entered.

Important aspects of relevant CIN documentation

- Focused History (relevant to presentation and what may impact on presentation)
- Clinical Assessment (relevant to presentation)
- Interventions
- Treatment commenced
- Response to treatment
- Escalation of concerns/actioning abnormal findings
- Who you have communicated with and handed the patient over to.

Key Points

- Documentation should be consistent with NSW Health and Local Health Network standards
- The format for documentation will vary based on Local Health Network policy
- As an emergency nurse, you are accountable for your actions and your documentation.

Activity – CIN Participant Manual

Complete Activities 1, 2 and 3 in the Documentation Module of the CIN Participant Manual.

Further Resources/Reading

- Staunton P & Chiarella M (2008) *Nursing and the Law*. 6th Ed. Elsevier: Sydney.

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Appendix 1

Respiratory Assessment

Statement of Purpose

The aim of this module is to emphasise the importance of an accurate respiratory assessment to inform appropriate management strategies. This will enable the CIN to re-assess the patient with a respiratory presentation and develop a plan of care for the patient while they are in the waiting room.

Learning Outcomes

At the completion of this module the participant will be able to:

- Outline the components of comprehensive respiratory assessment
- Identify a systematic approach to respiratory assessment and priorities
- Discuss the characteristics of respiratory distress and potential red flags
- Discuss diagnostics and monitoring to aid respiratory assessment
- Outline CIN interventions which may be initiated for the patient with respiratory problems
- Analyse and reflect on a respiratory management scenario
- Demonstrate competency in respiratory assessment.

Introduction

Respiratory problems account for a significant proportion of emergency presentations. Symptoms may range from mild to immediately life threatening. It is imperative that the CIN has the ability to identify early signs of respiratory compromise as well as the patient in respiratory distress. Secondary to assessment, the CIN must be able to implement appropriate interventions to maintain patient safety, provide adequate respiratory support and prevent further deterioration.

Respiratory Assessment

Primary Survey

The purpose of respiratory assessment is to identify the adequacy of gas exchange, tissue oxygenation and the excretion of carbon dioxide (Moore, 2007). Patient assessment of a respiratory complaint begins with a primary survey of airway, breathing, circulation, disability, exposure and a set of vital signs to identify life-threatening conditions and manage them immediately (Gum, 2007). Overt signs of respiratory compromise that may be identified during the primary survey requiring immediate intervention include:

- evidence of airway obstruction or compromise
- increased respiratory effort and marked accessory muscle use
- tachypnoea
- decreased speech tolerance
- pallor or cyanosis
- hypoxia despite oxygen therapy
- paradoxical chest wall movement
- decreased air entry
- altered level of consciousness

(Pandit, 2010).

After the primary survey, the clinician must reflect on their assessment findings and consider the following questions:

- Are immediate interventions required?
- Does the patient's condition require escalation of care or transfer to an area of higher acuity within the department.

If the answer is 'yes' to either of the above questions, immediately commence treatment and escalate care (Simpson, 2006). If no immediate interventions are required, continue the respiratory assessment.

Clinical History

It is vital to review the patient's clinical history during a comprehensive respiratory assessment to guide the remainder of the examination and help interpret clinical findings (Bradley, 2007; Kelly, 2004; Rempher & Gonce Morton, 2005; Simpson, 2006). A thorough clinical history should involve examination of the following areas:

- Presenting complaint:
 - a short statement, in the patient's words, for why they have come to the emergency department
- Allergies:
 - identify allergies, is an allergic reaction a component of this presentation?
- Medications:
 - Identify medications the patient is currently taking, drug classes that may alter interpretation of the physical assessment findings, eg beta blocker drugs
- Past medical/surgical and admission history
- Identify:
 - Conditions diagnosed and treated in the past
 - Chronic illnesses such as emphysema, chronic bronchitis, asthma, cystic fibrosis, heart failure, hypertension, cancer
 - Risk factors (eg for Pulmonary Embolus, smoking, etc)
 - Existence and adherence to a management plan eg asthma management plan
 - Surgery that may be relevant to the current presentation
 - Previous presentations to hospital for their current complaint
 - Historical indicators of potential for future rapid deterioration eg admission to high acuity areas HDU /ICU, past need for emergency intubation, past episodes of rapid deterioration requiring resuscitation or intensive interventions.
 - Past presentations to ED, number/frequency
 - Last menstrual period/last ate:
 - events leading to presentation/history of the presenting complaint and associated signs and symptoms (Rempher & Gonce Morton, 2005)
- Identify:
 - Sequence of events that led to hospital presentation
 - Associated symptoms: Key areas to be explored in associated signs and symptoms for a respiratory complaint include dyspnoea, chest pain, cough, and sputum production (Morton 2005)
 - Dyspnoea: does the patient express subjective feelings of being short of breath? Does the dyspnoea occur with exercise, relate to position? eg worse while lying down/better while sitting up? Do they experience orthopnea?
 - Chest pain: identify if the patient has experienced any pain/pressure/tightness in their chest or radiation of pain to jaw/shoulder/arm. If chest pain is present, further assess the pain via the mnemonic PQRST. P: precipitating and palliating factors to pain, Q: quality of pain, R: region and radiation, S: severity on pain scale 1-10, T: time of onset and duration
 - Sputum: identify amount and colour
 - Cough: identify onset, precipitating factors, timing, frequency and whether or not it is productive (Rempher & Gonce Morton, 2005).

Physical Assessment

Respiratory physical assessment incorporates: inspection, palpation, percussion and auscultation.

Inspection: identify following

■ General:

- Level of consciousness
- Agitation/anxiety
- Speech
 - sentences/phrases/words/unable to speak
 - quality (hoarseness)
- Skin colour
 - pallor/cyanosis
 - exercise tolerance/body position

(Brashers, 2005; Higginson & Jones, 2009; Moore, 2007; Simpson, 2006)

■ Head and Neck:

- nasal flaring
- pursed lip breathing
- mouth vs. nose breathing
- evidence of trauma: deformity, bruising, wounds, swelling, burns.
- Tracheal position
- Tracheal tug

(Bradley, 2007; Gaudry, Finckh, & Alford, 2009; Gray, 2004; Hunter & Rawlings-Anderson, 2008; Macken & Manning, 2004; Moore, 2007)

■ Thorax:

- symmetry of chest wall movement
- accessory muscle use, recession
- rate, rhythm, pattern of breathing
- evidence of trauma, wounds, deformity, flail, bruising, scars
- AP vs. transverse diameter of chest
- Alignment of spine: presence of kyphosis, scoliosis

(Aylott, 2006; Brashers, 2005; Higginson & Jones, 2009; Moore, 2007; Rempher & Gonce Morton, 2005; Simpson, 2006)

■ Extremities:

- Clubbing
- Oedema
- Peripheral cyanosis

(Brashers, 2005; Moore, 2007; Simpson, 2006)

Palpation

Palpate structures in the neck and thorax to locate abnormalities.

■ Neck:

- position of the trachea
- subcutaneous emphysema.

(Gaudry et al., 2009)

■ Chest:

Palpate thorax systematically, comparing left from right (*Simpson, 2006*).

Identify the following:

- Areas of bony or soft tissue tenderness, crepitus, depressions, bulges, pulsations, paradoxical movement and subcutaneous emphysema (*Simpson, 2006*).
- Assess respiratory excursion (expansion) (*Simpson, 2006*).
- identify tactile fremitus.

Auscultation

A structured approach should be taken, auscultating the anterior, posterior and lateral aspects of the chest, comparing the left to right sides and listening throughout inspiration and expiration (Rempher & Gonce Morton, 2005).

Breath sounds in the normal chest are created by airflow in the airways (*Simpson, 2006*). Commonly, these are described as tracheal, bronchial, bronchovesicular and vesicular breath sounds (Rempher & Gonce Morton, 2005).

Adventitious noises are abnormal sounds created by fluid or sputum accumulation, obstruction, bronchoconstriction, inflammation or pleural lining pathology (Rempher & Gonce Morton, 2005; *Simpson, 2006*). Common adventitious noises are crackles, wheezes, rhonci, pleural rubs and stridor (Rempher & Gonce Morton, 2005; *Simpson, 2006*).

Absent air sounds over lung tissue indicate absence of air movement. This may be due to consolidation or obstruction.

The absence of sound, or a quiet chest in a patient displaying increased respiratory effort is an emergent sign requiring immediate escalation and intervention (Jones, Endacott, & Crouch, 2002).

Refer to a breath sounds CD for examples of normal and adventitious airway sounds and typical sites for auscultation (many sites have these available or they are downloadable from sites such as YouTube).

Percussion

The quality of the sound heard indicates the nature of the structures beneath the hand (Rempher & Gonce Morton, 2005; *Simpson, 2006*). A dense structure such as consolidated tissue or liquid will give a dull sound, where as air filled structures will give a louder hollow sound called tympani (Rempher & Gonce Morton, 2005; *Simpson, 2006*). Percussion should be performed systematically starting from above the clavicles, comparing left to right of the chest at 3-4 cm intervals (*Simpson, 2006*).

Diagnostics and Monitoring

Pulse Oximetry

Pulse oximetry is a non-invasive means to monitor the saturation of haemoglobin in tissue capillaries. A beam of light is transmitted through tissue to a receiver (Moore, 2007), the amount of saturated haemoglobin alters the wavelengths of the transmitted light. This is then translated by the receiver into a percentage of haemoglobin saturation (Moore, 2007).

The oxygen saturation as measured by pulse oximetry (SpO₂) has a normal range of 95-99% (Rempher & Gonce Morton, 2005).

Consider following limitations of SpO₂ monitoring: Pulse oximetry is only an indication of saturation of available haemoglobin. Values should be interpreted in conjunction with clinical conditions such as low haemoglobin, poor peripheral perfusion and clinical history, such as exposure to carbon monoxide (Moore, 2007; Rempher & Gonce Morton, 2005).

Spirometry and Peak Flow

Peak flow and spirometry are commonly used in EDs to assess airflow limitations. Peak flow tests measure 'peak expiratory flow' which is the maximum flow achievable from a forced expiration starting at full inspiration (Booker, 2009a). It reflects resistance through the larger conducting airways and the reading is reached within the first 10th of a second on expiration (Booker, 2009a).

More sensitive information can be gained from spirometry. Spirometry measures two main values: forced vital capacity (FVC): the maximum volume of air expired from the point of maximal inspiration (Rempher & Gonce Morton, 2005), and forced expiratory volume (FEV₁): the volume of air exhaled during the first second of the exercise (MacIntyre, 2009). The ratio of these two measurements is calculated (FEV₁:FVC) (Booker, 2009b). A value of <80% of the predicted norm is indicative of an airflow limitation (Booker, 2009b). The predicted norm is calculated based on sex, height, age and race. Graphs depict normal values

across a range of parameters (Booker, 2009b; Brashers, 2005). In obstructive diseases such as COPD or exacerbation of asthma, airflow is reduced. This will be reflected with a decrease in FEV1, and greater time taken to expire the full breath (Booker, 2009b).

To gain a spirometry reading:

- position the patient as either sitting or standing
- instruct them to take as deep a breath as possible
- place the tube between their teeth, instruct patient to make a firm seal around the tube with their lips, then exhale as hard and as long as possible
- Repeat test a minimum of three times
- An average of the three readings is then recorded (Jones et al., 2002)
- After therapy is instituted, a second reading should be taken to gauge efficacy of treatment.

Chest X-ray

The chest x-ray is a common diagnostic tool for pulmonary and thoracic assessment in the ED. The image is used to assess lung fields, disease processes, presence of trauma sequelae such as fractures, haemo/pneumothorax as well as position of invasive lines and tubes. Local protocols will guide the initiation of chest x-ray in the respiratory patient by the CIN nurse.

Support of Respiratory Function

Oxygen Therapy

Oxygen therapy devices are categorised as low-flow or high-flow, and provide fixed or variable concentrations of oxygen. A choice regarding appropriate oxygen therapy and delivery device should be informed by the patients support requirements. If a patient is requiring oxygen therapy (and this is not their usual requirement) this patient is not safe for treatment within the waiting room and requires escalation of care or transfer to different management area.

Common nurse initiated medications for respiratory presentations

Refer to CIN module: Pharmacology for information regarding utilisation of Salbutamol and Ipratropium Bromide.

Considerations for Referral

If a patient is involved with a respiratory outpatient program, early contact should be made with the program to enable input towards management, and determine available supports in the home environment. Early liaison with the respiratory outpatient program may present other options for management than admission to an acute hospital bed. Various models of outpatient respiratory care programs have been developed in different locations. The aim of these programs may incorporate some or all of the following areas: to facilitate early discharge from hospital with follow-up care in the home, development of action and/or offer plans to guide management of future exacerbations thereby reducing admission rate, provide pulmonary rehabilitation services, specialist review services within home or hospital for acute exacerbations (McKenzie, Dunford, & Wilcox, 2007). The CIN should be guided by local referral options.

Learning Activity

Refer to the CIN participant manual and complete the learning activity.

Key Points

- Respiratory deterioration is a common reason for presentation to an Emergency Department
 - The aim of respiratory assessment is to determine respiratory status, identify deterioration in patients at risk and to guide and evaluate the effectiveness of treatment
 - A comprehensive respiratory assessment includes a relevant patient history and physical assessment incorporating inspection, percussion, palpation, and auscultation
 - Physical assessment can be further informed by appropriate use of investigations such as pulse oximetry, radiography, peak flows and spirometry
 - Accurate respiratory assessment should inform investigations and plan of care as well as resource and environment allocation to maintain patient safety.
-

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Appendix 2

Abdominal Assessment

Statement of Purpose

The aim of this module is to provide the clinician with the ability to use a systematic approach to abdominal assessment and identify those patients that are at risk of an acute abdomen.

Learning Outcomes

At the completion of this module the CIN will be able to:

- Undertake a systematic approach to abdominal assessment
- Identify the signs and symptoms of specific abdominal pain
- Discuss the need for specific diagnostic studies related to the location/type of abdominal pain
- Demonstrate competency in abdominal assessment.

Introduction

Abdominal pain is a common ED complaint and frequently proves to be a diagnostic challenge for many reasons;

- It may be difficult for the patient to convey the quality and nature of the pain. Physical examination findings can be misleading and variable
- The severity and location of the pain may change over time.

Benign-appearing symptoms and presentations may evolve into life-threatening conditions.

Many patients present with pain and other symptoms that are not typical of any specific disease process. A specific diagnosis may not be possible in about one in every four patients. The adult groups requiring careful consideration are: the elderly (older than 65 years of age), the immunocompromised, and women of reproductive age.

General causes include:

- Aortic aneurysm
- Peritonitis
- Appendicitis
- Pancreatitis
- Bowel obstruction, bowel dysfunction, bowel perforation, hernia
- Peptic ulcer
- Diverticulitis
- Cholelithiasis, cholecystitis, hepatitis, hepatic failure.

Gynaecological causes include:

- Ovarian torsion, ovarian cyst
- Endometriosis, dysmenorrhoea
- Carcinoma
- Pelvic Inflammatory Disease (PID).

Pregnancy related causes include:

- Ectopic pregnancy
- Miscarriage
- Labour
- Pre-eclampsia; (Right Upper Quadrant (RUQ) and/or epigastric pain)
- Ligament pain, joint pain
- Trauma.

Causes of abdominal pain from areas external to the cavity include:

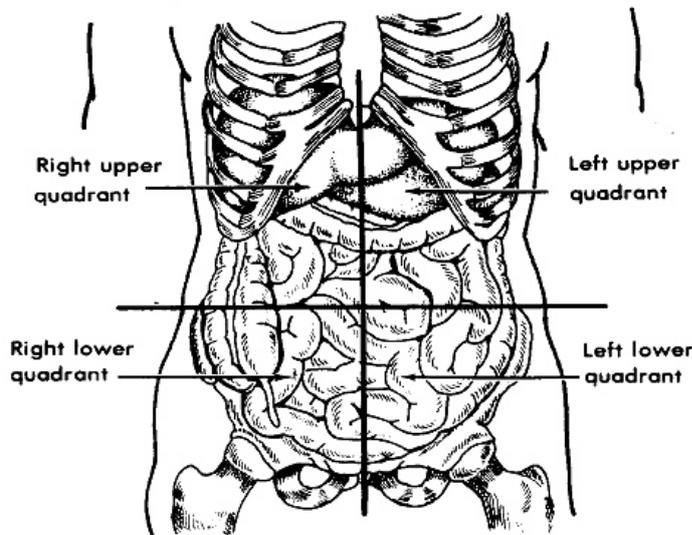
- Myocardial ischaemia/infarct
- Pneumonia (particularly in children)
- Thoracic injury
- Oesophagitis, oesophageal spasm
- Neuropathic causes – herpes zoster, spinal cord or peripheral nerve tumours
- Toxins- snake venoms, lead poisoning
- Metabolic disorders- porphyria, diabetic ketoacidosis
- Haematological disorders – Sickle cell anaemia.

Anatomy

The abdominal cavity extends from the diaphragm to the pubic symphysis. It is a large cavity containing vital organs and major vessels and is lined or covered by the peritoneum. The abdominal organs are offered some protection by the muscular structures of the rectus abdominis and internal and external obliques.

For the purpose of assessment the abdomen is divided into four (4) quadrants, this provides a systematic approach to recognising possible causes of abdominal pain (Figure 1).

Figure 1 *The quadrants of the abdomen*



Right Upper (RUQ)	Left Upper (RUQ)
Small bowel Liver and Gallbladder Pylorus Duodenum Head of Pancreas Hepatic flexure of colon Portions of ascending and transverse colon Right adrenal gland Portion of right kidney	Small bowel Left lobe of liver Spleen Stomach Body of Pancreas Splenic flexure of colon Portions of transverse and descending colon Left adrenal gland Portion of left kidney
Right Lower (RUQ)	Left Lower (RUQ)
Small bowel Cecum and appendix Portion of ascending colon Lower pole of right kidney Right ureter	Small bowel Sigmoid colon Portion of descending colon Lower pole of left kidney Left ureter

The Quadrants of the Abdomen. Downloaded December 2010 from: <http://www.free-ed.net/sweethaven/MedTech/NurseCare/GastroNurse01.asp?iNum=17>

** During pregnancy due to the displacement of the bowel with the enlarging uterus the appendix may be displaced upward toward RUQ*

Causes of Abdominal Pain

The patient presenting with abdominal pain requires a thorough history and physical assessment to determine its actual or potential acuity. This requires a sound knowledge of the causes of abdominal pain and of the clinical assessment required. The cause of abdominal pain may originate from within the abdomen itself secondary to organ dysfunction, disruption to blood vessels or traumatic injury. Three processes are associated with the production of abdominal pain:

1. Tension in the GI tract wall from muscle contraction or distension (colic and visceral pain are types of tension pain)
2. Ischaemia (intense continuous pain)
3. Inflammation of the peritoneum (Visceral peritonitis is a poorly localised aching, whereas parietal peritonitis is more severe and perceived in the area corresponding to the inflammation).

The patient with parietal peritonitis often lies still and is reluctant to move. Pain may also originate from an area external to the abdominal cavity and radiate to the abdomen.

Causes of pain from within the abdominal cavity include general causes, gynaecological causes and pregnancy related causes.

Table 1: Types and Locations of Abdominal Pain

Disorder	Pain	Referred Pain
Abdominal Aortic Aneurysm	Central abdominal & back pain	Back
Appendicitis	Periumbilical pain to RLQ pain	Right shoulder pain
Bowel Obstruction	Epigastric or periumbilical pain	
Cholecystitis	Middle epigastric pain	Right shoulder/scapula pain
Diverticulitis	LLQ pain	
Pancreatitis	Middle epigastric or periumbilical pain	Back, left flank and left shoulder pain
Pelvic Inflammatory Disease	Lower abdominal pain	
Ectopic pregnancy	One side lower abdominal pain	Shoulder tip pain

Adapted from Bartley (2008)

Patient Assessment

History

A good history is the key to determining concerning features of abdominal pain and will guide the physical assessment.

Pain may be generalised, which may make it difficult to find a focus; or localised pain over a specific region of the abdomen, which helps to narrow down the possible cause.

A complete history of the current symptoms should include:

Location: The embryologic origins of abdominal organs determine where a patient will “feel” visceral pain.

- Epigastric pain typically is related to the stomach, pancreas, liver, biliary system, and proximal duodenum, ask about nausea & vomiting
- Peri umbilical region – the rest of the small intestines and the proximal third of the colon (including the appendix)
- Left lower quadrant or suprapubic region; the bladder, uterus, and distal two thirds of the colon- ask about changes in stool frequency, constipation, rectal bleeding
- Pain is usually reported in the back for retroperitoneal structures such as the aorta and kidneys.

Radiation: Radiation may be characteristic of a given disease (eg radiation from epigastrium to back in pancreatitis) or may reflect the progression of disease (eg continued aortic dissection or migration of ureteric calculi).

Onset

How long has the patient had the pain, and what type of onset did the pain have – acute or gradual? Acute onset of pain that is becoming progressively worse may signal a surgical emergency. Sudden onset pain is more likely associated with colic, perforation, ruptured abdominal aneurysm or acute ischaemia. Elderly patients may not present as expected, in a study of patients older than 70 years who had perforated ulcers, only 47% reported sudden-onset pain (Yeh 2007).

Slower onset is associated with inflammatory conditions such as appendicitis and cholecystitis. However gradual onset is possible with a serious vascular issue such as mesenteric ischemia in an elderly patient.

Pain characteristics

Qualify the nature of the pain: – is it dull, sharp, burning, gnawing, stabbing, cramping, aching, colicky or tearing, and what is the intensity, has this changed? How has the pain affected the person’s ability to self-care? Use the PQRST mnemonic to evaluate the pain:

What preceded the pain?

Associated events: Anorexia, vomiting, diarrhoea, and urinary symptoms should be investigated. Pain frequently precedes vomiting in surgical conditions.

What provokes the pain, what relieves the pain/how severe is the pain at rest and with activity?

Pain with movement usually signifies peritoneal irritation. Asking the patient about their trip to ED may prompt the patient with peritoneal irritation to remark on an increase in pain that occurred when hitting a bump. Pain after eating may reflect peptic ulcer disease, biliary disease, or mesenteric ischemia. Is the patient adopting a position of comfort?

Intensity: Severe pain should raise concerns about a serious underlying cause; however, descriptions of more mild pain should not dissuade the clinician from further evaluation.

Duration and progression:

Persistent, worsening pain is worrisome. The patient should also be questioned about any self-treatments and previous episodes of pain. Recurrent episodes generally point to a medical cause, with the exceptions of mesenteric ischemia (intestinal angina), biliary disease, and partial bowel obstruction.

What are the associated symptoms?

The range of associated symptoms include; nausea, vomiting, fevers, thirst, dizziness, diaphoresis, altered bowel movements, melaena, abdominal distension, recent surgery, recent major trauma urinary symptoms, burping, halitosis, weight loss, weight gain and vaginal discharge.

Other

The patient should also be questioned about any self-treatments or Medications taken for this event. Remember to use cues to explore involvement of other systems. Ask about recent travel or camping.

Assess the patients Past Medical/Surgical History (PMH)

- PMH (Allergies, Medications, Past medical history, Last ate, Events leading to this presentation); recent trauma
- Last menstrual period
- Past surgical history/past gynaecological history
- Drug history
- Social history
- Brief review of other systems especially cardiovascular and respiratory.

Questions which yield useful information in Abdominal Assessment are listed in Table 2.Table 2: **Useful information in Abdominal Pain Assessments****High-Yield Historical Questions**

1. How old are you? Advanced age means increased risk.
2. Which came first—pain or vomiting? Pain first is worse (, more likely to be caused by surgical disease).
3. How long have you had the pain? Pain for less than 48 hours is worse.
4. Have you ever had abdominal surgery? Consider obstruction in patients who report previous abdominal surgery.
5. Is the pain constant or intermittent? Constant pain is worse.
6. Have you ever had this before? A report of no prior episodes is worse.
7. Do you have a history of cancer, diverticulitis, pancreatitis, kidney failure, gallstones, or inflammatory bowel disease? All are suggestive of more serious disease.
8. Do you have human immunodeficiency virus (HIV)? Consider occult infection or drugrelated pancreatitis.
9. How much alcohol do you drink per day? Consider pancreatitis, hepatitis, or cirrhosis in patients with history or signs of significant intake.
10. Are you pregnant? Test for pregnancy—consider ectopic pregnancy.
11. Are you taking antibiotics or steroids? Effects of these drugs may mask infection.
12. Did the pain start centrally and migrate to the right lower quadrant? High specificity for appendicitis.
13. Do you have a history of vascular or heart disease, hypertension, or atrial fibrillation? Consider mesenteric ischemia and abdominal aneurysm.

From Colucciello SA, Lukens TW, Morgan DL: Abdominal pain: An evidence-based approach. Emerg Med Pract 1:2, 1999.

Sourced from: Benjamin, Budhram, King, & Wightman (2010)

▶ **Red Flags** from the elicited History

(should raise the index of suspicion of more serious causes)

- Pain that:
 - Is steady, severe and progressing pain
 - Persists for longer than 6 hours
 - Awakens the patient from sleep
 - Is sudden or severe enough to cause syncopal symptoms
 - Changes location
 - Is colicky pain and becomes steady.
 - Is knife like or tearing in nature
 - Is severe pain post vomiting
- Change in vital signs – increased respiratory rate, hypotension
- Elderly patients with abdominal pain (Age > 75) - there is a high mortality associated with abdominal pain in this patient population. (Guarding and rigidity may be lacking because of laxity in the abdominal wall musculature. A disturbing finding is that only 21% of patients older than 70 with a perforated ulcer presented with epigastric rigidity.)
- The following patient groups:
 - Patients with diabetes
 - Immunocompromised patients
 - Patients with a known Abdominal Aortic Aneurysm (AAA)
 - Pregnancy/changed or missed period
 - Those on anticoagulant therapy
 - Recent trauma
- Gastro intestinal (GI) bleeding
- Weight loss
- No bowel opening
- Atrial Fibrillation.

The Physical Assessment

General Overview

Commence with a quick overview of ABCD/Full set of vital signs

- Note their general appearance and positioning; are they restless or reluctant to move?
- A handy tip regarding some generalisations of positioning:
 - Parietal Pain – peritoneal irritation – patients may adopt the foetal position
 - Visceral Pain – Patients lie supine with legs outstretched and are reluctant to move.
- Is there jaundice or anaemia?
- Note their hydration status, mucous membranes and skin turgor
- Take a full set of vital signs, including postural blood pressure and blood sugar level and note any abnormalities.

▶ Red Flags

- Distressed/Unwell looking patient
- Abnormal vital signs
- Diaphoresis/Jaundice/Cyanosis
- Restless patient or someone who wants to stay still
- The presence of confusion/delirium
- Occlusion in a hollow organ – restless prefer to be upright – colic
- Patients that lie very still with shallow breathing should raise concern of an 'acute abdomen'.

Focussed abdominal assessment

If they can tolerate it, position the patient to undertake a physical assessment:

- Lying flat with one pillow under their head and arms alongside the body*
- Expose the abdomen – above xiphoid process to symphysis pubis
- You may expose the area in stages to preserve the patients dignity/keep them warm.

* Document if the patient is unable to tolerate this position.

Inspection

Look at all four quadrants and observe for the following:

- The skin colour, tension (rigid or soft?), contour (distension), presence of prominent veins or scars, local swelling, broken skin such as lesions or stoma
- Discolouration or masses
- Movement (peristalsis, pulsations, or foetal).

Tips that may help you interpret what you observe

- 7 F's of distension – fat, fluid, foetus, flatus, faeces, 'filthy' big tumour, and 'phantom' pregnancy.
- Local swelling – enlargement of the one of the abdominal organs
- Veins – portal hypertension
- Pulsations – AAA
- Peristalsis – could be normal in thin patients – intestinal obstruction
- Discolouration – may indicate the presence of 'signs' eg Cullen's/Grey Turner.

Auscultation

Performed before percussion.

Listen to all four quadrants for 2 minutes.

- Bowel sounds:
 - 5 per minute indicates decreased
 - 35 per minute indicates hyperactive (indicative of gastroenteritis, early obstruction or GI bleeding).

Tips that may help you interpret what you hear

- Obstructed bowels – louder and higher pitch sound
- Absent bowel sounds can only be documented if not present for 4 mins
- Obstructed bowel sounds – louder and higher pitch with a tinkling quality due to the presence of air and liquid.

Palpation

Preparation:

Warm your hands and start palpating remembering to leave the painful region until last:

- Commence with light palpation to each region (1 - 2 cm), and if no signs are elicited recommence palpating deeper to each region (4 - 5 cm).

The aim of palpation is to identify the following:

- Resistance or guarding to touch
- Distension and the presence of a tense abdomen/Ascites
- Tenderness, localising pain
- Palpable masses (and if they are pulsatile in nature)
- Flank pain
- Pregnancy/movement
- Scar tenderness.

Palpate the pulses in both feet.

Percussion

- Percuss for density, dullness, resonance.

Table 3: **Features of Peritonitis**

<i>Features of Peritonitis</i>	
PAIN	front, back, sides, shoulders
ELECTROLYTES	fall shock ensues
RIGIDITY	or rebound of anterior abdominal wall
IMMOBILE	abdomen and patient
TENDERNESS	with involuntary guarding
OBSTRUCTION	
NAUSEA	and vomiting
INCREASING	pulse, decreasing pulse pressure
TEMPERATURE	falls then rises, Tachypnoea
INCREASING	girth of abdomen
SILENT	abdomen

Diagnostics

Depending on the History and Examination, a number of diagnostic tests can aid in the diagnosis of abdominal pain.

Common diagnostic tests that the CIN can perform or arrange include:

- Blood Sugar Level
- Patient weight
- Urinalysis +/- MSU
- +/- urine BHCG if the patient is a female of child bearing age
- ECG with medical review.

Pathology tests commonly ordered include:

- Full Blood Count
- U&E: Na, K, Urea
- Glucose.

Other tests that may be indicated include:

- Enzymatic liver function tests – if liver disease is suspected
- Coagulation studies if the patient is on warfarin, or has suspected liver disease
- Blood cultures if Temp > 38
- Ca, Mg, Phosphate – for patients who have had reduced dietary intake or are elderly
- Lipase – for suspected pancreatitis
- Venous blood gas, including lactate – if elderly and/or in atrial fibrillation or signs of SIRS are present
- Group & Hold as indicated
- Bladder scan/ultrasound as clinically indicated.

CINs must be guided by local protocols which outline the diagnostic blood set and other tests that may be initiated.

Initial management

Pain management is a priority for CINs

In the patient who is haemodynamically stable, early pain relief is a priority. It is now accepted evidence that true surgical cases will not be masked by analgesia, and administering analgesia may aid the diagnostic process.

The choice of analgesia and delivery method will be guided by the pain assessment and the CIN protocols.

Evaluation of the effectiveness of analgesic therapy is important, not only for patient comfort, but also as informing the CIN of changes in the patient's condition.

Acute changes- may indicate a deterioration and raise the patient's priority for medical management especially increased pain or rigid abdomen

Key Points

- Use a structured approach when taking history
 - Listen to the patients concerns
 - Use a systematic approach to abdominal assessment
 - Diagnostic test decisions should be made on clinical findings
 - Escalate any concerns about the patient to a senior staff member
 - Do not withhold pain relief – analgesia will not mask a true surgical case.
-

Activity Case Scenario

Complete the activity (case scenario) in the participant manual.

References/Further Resources/Reading

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