IMED4403 Preparation for Practice

Level 4 Procedural Skills

Handbook 2011

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A/Prof Sandra Carr

Student name:______________________

Student number:___________________

This guidebook is for use by students enrolled in Level 4 of the medical course - it may not be reproduced in any form.
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Teaching and Learning

We believe you will learn best through your experience. You will learn most if you take an active, self-directed approach towards obtaining clinical experience of these procedural skills, apply this experience to improving your ability and evaluate through reflection your own skills and abilities.

We will encourage your learning by:
- Providing a supportive learning environment that centres on student needs
- Conducting an orientation session to the procedural skills program
- Documenting transparent learning outcomes so students know what learning is expected of them
- Providing structured skills training programs
- Documenting assessment methods clearly
- Providing formative feedback for all students
- Providing supporting instructional material.

Learning Outcomes
- Discuss issues of confidentiality and legal requirements when obtaining consent to perform a procedure.
- Describe and demonstrate ability to correctly perform the following procedural skills with supervision:
  - Phlebotomy
  - IV cannulation
  - Urinary catheter insertion
  - Injections
  - Safe movement of patients.
- Describe and demonstrate principles of asepsis through hand-washing, open gloving technique, preparation and maintenance of a sterile field when performing the above skills.
- Describe and demonstrate the basic life support algorithms, use of airways and bag-mask ventilation and shock advisory defibrillation.
- Discuss with clinical insight when these procedural skills would be required.

Learning Experiences
- Structured standardised skill training programs - compulsory attendance.
- Facilitation of opportunities to practice in clinical setting through Nursing Attachment and ward rotations, phlebotomy services and introduction to continence nurses in each hospital.

Assessment
- The Assessment of procedural skills is part of the unit “IMED4411/4412 Clinical Skills”.
- All students will receive written and verbal feedback through formative assessment at the end of each skill training program and during their CCM Nursing Attachment.
- Students need to record experience of these procedural skills and ask each person who supervised them to provide feedback. Students need to perform at least one of each of the skills listed in the log book during 4th year. If you have not achieved this by mid August 2011 you need to contact your current unit coordinator to facilitate relevant experience. This is your responsibility.
- Students are encouraged to rate their own skill development using the self-assessment tools included.

- Students must submit their record of experience sheets to the Faculty Office by beginning of SWOTVAC. Failure to do so may result in the student being excluded from the level 4 OSCE examination.
- These skills are assessable in the level 4 OSCE.
SKILL A

Asepsis, Injection, Cannulation

Hand-hygiene, Open Gloving and Wound Dressing Technique

Skill Training Program 2011

Outcomes

By the end of Level 4 the student will be able to:

1. Describe principles of Asepsis
2. Explain and demonstrate correct method of hand-hygiene
3. Handle sterile supplies without contaminating equipment
4. Don sterile gloves without contaminating outside of gloves using an open glove technique
5. Apply a dry sterile dressing
   a. Explain procedure and obtain consent
   b. Wash hands.
   c. Drape and position the patient
   d. Collect, handle and open equipment using sterile technique
   e. Remove soiled dressing using a disposable glove
   f. Put on sterile gloves
   g. Assess wound and healing
   h. Use saline (or other cleaning solution) to cleanse wound and surrounding skin, discarding swab after each stroke
   i. Apply and anchor sterile dressing using instruments
   j. Dispose of dressing equipment and waste safely
   k. Document wound status noting changes in clinical status of patient outside normal parameters
6. Discuss how to use personal protective equipment (PPE) to provide a barrier between the source of potential infection and the operator
   a. Gloves
   b. Gowns
   c. Protective eye/face wear
TUTORIAL INFORMATION

1. Principles of Asepsis

Aseptic practices refer to precautions designed to prevent undue contamination of a person, object or area by micro-organisms. Aseptic practices are indicated if performing any invasive procedure, for example surgical procedures, dressing open wounds or insertion of indwelling cannulae. Measures employed to achieve asepsis include:

- performance of appropriate hand-hygiene
- preoperative skin and body cavity preparation
- supply and storage of sterile equipment
- antiseptic and disinfectant use
- management of indwelling devices
- environmental controls such as air filtration.

Resident flora

These organisms live and multiply on the skin (mainly on superficial layers, but 10-20% inhabit deep layers) and can be repeatedly cultured, even after routine hand-washing. Although these organisms are generally harmless, they are of special concern if staff are performing invasive procedures. In these circumstances they need to be reduced and inhibited using an antimicrobial preparation, to prevent cross-infection.

Transient flora

These organisms are present in the hospital micro-environment and contaminate the hands of hospital staff during normal work activities. They can be readily passed on to another person during contact and will survive on the hands for up to 24 hours if not removed by hand-washing. (Occasionally, despite routine hand-washing, a transient organism may take up "temporary residence" for a period of several weeks.) Contamination with transient flora may occur in the absence of visible soiling. **Routine hand-washing** is performed to remove transient microbial flora derived from touching one's skin, another person's skin, or some object in the environment. Antimicrobial skin cleansers are not required.

2. Hand-hygiene

Hand-hygiene is the most important and most basic technique to prevent the spread of infection.

Hands should be cleaned **before** significant contact with any patient. Significant contact activities include: examination of a patient, or similar prolonged contact, inspection of a wound or intravascular cannula site, emptying a catheter or drainage reservoir, undertaking a venepuncture or a dressing, changing an IV flask or manipulating any similar "closed" sterile system and delivery of I.M, S.C or IV injections.

Hands should be cleaned **after** activities likely to cause contamination. Activities known to cause significant contamination include: handling objects or materials soiled with body secretions or excretions, direct contact with body secretions or excretions, direct contact with mucous membranes, wounds, tracheostomy, and personal hygiene after toileting. Gloves should be used as an adjunct to hand-washing when contamination of hands with blood or body fluids is anticipated. Gloves should be changed and hands washed between patients.
Gloves must be worn according to STANDARD and CONTACT PRECAUTIONS. The pyramid details some clinical examples in which gloves are not indicated, and others in which examination or sterile gloves are indicated. Hand hygiene should be performed when appropriate regardless indications for glove use.

Figure 1 - Indications for use of Gloves (WHO 2009)
Hand Hygiene Procedures

The two most frequent methods of hand hygiene are handwashing and handrubs.

Handwashing
The frequency and method of hand-washing expected of you varies according to the hospital area in which you work. At a minimum, hands should be washed before, between and after any patient contact. Plain soap should be used for hand-washing unless otherwise indicated. The rationale for using either a routine or surgical hand wash is based on the knowledge that hands carry two different types of flora: resident and transient.

(Minimum 15 second wash) Ensure all skin surfaces are accessible. Ensure nails are clean, short and unvarnished and watches and jewellery are removed. Wet hands thoroughly. Hands should then be lathered with soap or skin cleanser (antiseptic preparations are not required) and vigorously rubbed together for at least 15 seconds, paying attention to all areas on both hands. Commonly missed areas are finger tips, interdigital areas, thumbs and wrists. Rinse under a moderate stream of water. Thoroughly dry hands with paper towel. To minimize "chapping" of hands, pat dry rather than rubbing them (personal barrier cream application will also help prevent "chapping"). If elbow operated taps are unavailable, whilst still holding towel, use this to turn off the tap. (See Figure 2).

Handrubs
When using an alcohol-based handrub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Note that the volume needed to reduce the number of bacteria on hands varies by product. Alcohol-based handrubs significantly reduce the number of microorganisms on skin, are fast acting and cause less skin irritation. Allergic contact dermatitis due to alcohol handrubs is very uncommon. Handrubs should not be used if the hands are obviously soiled. (See Figure 3)
**Hand Hygiene Technique with Soap and Water**

**Duration of the entire procedure:** 40-60 seconds

1. Wet hands with water;
2. Apply enough soap to cover all hand surfaces;
3. Rub hands palm to palm;
4. Right palm over left dorsum with interlaced fingers and vice versa;
5. Palm to palm with fingers interlaced;
6. Backs of fingers to opposing palm with fingers interlocked;
7. Rotational rubbing of left thumb clasped in right palm and vice versa;
8. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
9. Rinse hands with water;
10. Dry hands thoroughly with a single use towel;
11. Use towel to turn off faucet;

*Your hands are now safe.*

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**Figure 2 - Hand Hygiene Technique With Soap and Water** (WHO 2009)
Hand Hygiene Technique with Alcohol-Based Formulation

**Duration of the entire procedure**: 20-30 seconds

1. **Apply a palmful of the product in a cupped hand, covering all surfaces**;
2. **Rub hands palm to palm**;
3. **Right palm over left dorsum with interlaced fingers and vice versa**;
4. **Palm to palm with fingers interlaced**;
5. **Backs of fingers to opposing palm with fingers interlocked**;
6. **Rotational rubbing of left thumb clasped in right palm and vice versa**;
7. **Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa**;
8. **Once dry, your hands are safe**.

**Figure 3 - Hand Hygiene Technique with Alcohol-Based Formulation** (WHO 2009)
When the hand hygiene indication occurs before a contact requiring glove use, perform hand hygiene by rubbing with an alcohol-based handrub or by washing with soap and water.

I. HOW TO DON GLOVES:

1. Take out a glove from its original box
2. Touch only a restricted surface of the glove corresponding to the wrist (at the top edge of the cuff)
3. Don the first glove

4. Take the second glove with the bare hand and touch only a restricted surface of glove corresponding to the wrist
5. To avoid touching the skin of the forearm with the gloved hand, turn the external surface of the glove to be donned on the folded fingers of the gloved hand, thus permitting to glove the second hand
6. Once gloved, hands should not touch anything else that is not defined by indications and conditions for glove use

II. HOW TO REMOVE GLOVES:

1. Pinch one glove at the wrist level to remove it, without touching the skin of the forearm, and peel away from the hand, thus allowing the glove to turn inside out
2. Hold the removed glove in the gloved hand and slide the fingers of the ungloved hand inside between the glove and the wrist. Remove the second glove by rolling it down the hand and fold into the first glove
3. Discard the removed gloves

4. Then, perform hand hygiene by rubbing with an alcohol-based handrub or by washing with soap and water

Figure 4 - How to don Non-sterile gloves  (WHO 2009)
3. Opening Sterile Packages

Used in sterile procedures to maintain sterility of equipment, supplies and liquids.

Procedure
1. Remove outer package or tape.
2. Place sterile package in centre of working space with first fold away from you (Fig. 1-A).
3. Open sterile package by grasping the outside top fold of wrapper at edge. Open this portion of wrapper away from you, reaching across package (Fig. 1-B).
4. Reach to centre of package from one side (right or left); grasp folded tip of uppermost layer of wrapper with right (or left) hand and fold open to side (Fig. 1-C).
5. Reach to centre of package from opposite side (left or right); grasp folded tip of next layer of wrapper with left (or right) hand and fold open to opposite side (Fig. 1-D).
6. Reach from centre front, grasp the final tip of wrapping with hand protected by wrap; and pull open toward worker (Fig. 1-E).
7. Identify sterile field before proceeding with use of sterile tray.

![Figure 5 - Opening a sterile pack](from Sorenson and Luckmann - page 931)

4. Putting On Sterile Gloves - Open Glove Technique

Gloves are worn to prevent contamination of wounds, sterile equipment or supplies (from micro-organisms on the worker's hands) and/or to prevent transmission of micro-organisms in the environment to a patient.
The purpose of this technique is to ensure maximum asepsis for the patient and to protect the health-care worker from the patient's body fluid(s). To achieve this goal, the skin of the health-care worker remains exclusively in contact with the inner surface of the glove and has no contact with the outer surface. Any error in the performance of this technique leads to a lack of asepsis requiring a change of gloves.

I. HOW TO DON STERILE GLOVES

1. Perform hand hygiene before an "aseptic procedure" by handrubbing or hand washing.
2. Check the package for integrity. Open the first non-sterile packaging by peeling it completely off the heat seal to expose the second sterile wrapper, but without touching it.
3. Place the second sterile package on a clean, dry surface without touching the surface. Open the package and fold it towards the bottom so as to unfold the paper and keep it open.
4. Using the thumb and index finger of one hand, carefully grasp the folded cuff edge of the glove.
5. Slip the other hand into the glove in a single movement, keeping the folded cuff at the wrist level.
6-7. Pick up the second glove by sliding the fingers of the gloved hand underneath the cuff of the glove.
8-10. In a single movement, slip the second glove on to the ungloved hand while avoiding any contact/resting of the gloved hand on surfaces other than the glove to be donned (contact/resting constitutes a lack of asepsis and requires a change of glove).
11. If necessary, after donning both gloves, adjust the fingers and interdigital spaces until the gloves fit comfortably.
12-13. Unfold the cuff of the first gloved hand by gently slipping the fingers of the other hand inside the fold, making sure to avoid any contact with a surface other than the outer surface of the glove (lack of asepsis requiring a change of gloves).
14. The hands are gloved and must touch exclusively sterile devices or the previously-disinfected patient's body area.

Figure 6 – How to don sterile gloves (WHO 2009)
5. Applying Dry Sterile Dressing

Definition and Purpose
To cover a wound with a sterile dressing in order to protect the wound from environmental contaminants and the environment from wound contaminants. Soiled dressings are replaced (usually with permission of physician) for physical and aesthetic comfort of the patient as well as to provide time for personnel to observe the wound, assess healing, and remove moist dressing to reduce potential wound contamination. Used to protect skin around a wound, to support or to splint a wound.

Procedure
1. Wash hands carefully
2. Drape and position patient properly
3. Prepare equipment using sterile technique:
   a) Open sterile dressing pack on clean and dry, flat surface
   b) Open and place sterile supplies and equipment to be used on sterile field
   c) Pour small amount of cleansing solution (if used) in gallipot
4. Gently fold bedclothes back, exposing dressing
5. Loosen tape, beginning at edge of tape distal to centre of wound and pull skin away from tape toward wound
6. Remove soiled dressing, using a non-touch technique, by placing hand inside waterproof bag, grasping dressing and gently rolling it off (observe for adherence of dressing). Then pull bag over dressing. (If dressing large and/or highly contaminated use non-sterile gloves to remove individual layers.)
7. If dressing adheres to wound, moisten with sterile water, hydrogen peroxide (3%) and ½ strength, or other appropriate sterile solution until dressing lifts off easily
8. Put on sterile gloves if necessary
9. Thoroughly assess the wound, examining with eyes, nose and gentle palpation
10. Remove adhesive around wound with acetone or adhesive remover on swabs. Take care to work gently and with as little product as necessary. Wash skin with soap and water if acetone used
11. Use saline (or other cleansing solution) or povidone-iodine (or other disinfectant) to cleanse wound and surrounding skin, discarding each swab after each stroke
12. Apply ointment if prescribed, using same technique as for cleansing. Required amount should be dispensed into gallipot during preparation to prevent cross-contamination
13. Remove gloves and discard into bag with used dressing and swabs
14. Apply sterile dressing using instruments (Kelly, thumb or haemostat forceps), placing small dressing directly over wound and covering with larger dressing as necessary. Use additional dressing in dependent parts to collect drainage
15. Anchor dressing securely in place
16. Replace covers over patient and position patient comfortably
17. Collect used equipment for removal to designated pail. Discard disposable equipment into waterproof bag. Wrap or cover non-disposable equipment for return to appropriate area and clean trolley
18. Wash hands thoroughly
6. Personal Protective Equipment

Personal protective equipment (PPE) provides a barrier between the potentially infective source and the operator. Its use does not negate the need for safe work practices or hand hygiene. In many situations the risk of exposure to blood and body fluids can be determined in advance, so the appropriate PPE should be worn prior to performing the procedure or task. PPE may include: gloves, gowns and aprons, eye and/or facial protection (glasses, goggles, and face shields), masks, adequate footwear.

**Gloves** must be worn whenever there is a risk of direct contact with blood, body fluids, mucous membranes, non-intact skin or contaminated equipment or surfaces. Types of gloves worn should be appropriate to the task: **sterile gloves** for procedures involving normally sterile areas of the body, **non sterile examination gloves** to be used for all other contacts, **general-purpose utility gloves** to be used for cleaning and during manual decontamination of used instruments and equipment. Contaminated gloves must be changed immediately to minimise environmental contamination. Hand hygiene is essential whenever any gloves are removed. Allergy or sensitivity may develop to glove powder or contact with latex proteins. Powder free latex gloves or alternatives to latex are available and should be used by those who develop sensitivity. Seek advice from the Occupational Health and Safety Unit. It is the responsibility of the individual to arrange for specifically required gloves to be ordered and supplied.

**Gowns** are worn to protect the wearer’s clothing and skin from contamination with blood and body substances. Fluid resistant gowns/plastic aprons are indicated in situations where contamination with large amounts of blood or body fluid is anticipated. A plastic apron can be worn beneath a sterile gown to give added protection if strike through is a possibility during surgical procedures. Gowns/aprons are also worn by personnel during the care of patients infected or colonised with epidemiologically important micro-organisms to reduce the opportunity for transmission of pathogens from patients or items in their environment to other susceptible patients, and require separate specialised disposal. Neckties and lanyards require securing or temporary removal to prevent contamination.
Protective eyewear (goggles, glasses or face shields) must be worn during procedures likely to cause splattering, splashing or spraying of blood or body fluids. Eyewear should be: shielded at the side and close fitting, cleaned after use in detergent and water if contaminated.

Masks are worn to protect the mucous membranes of the mouth and nose during procedures likely to cause splattering, splashing or spraying of blood or body fluids. High efficiency masks with filtration to 1 micron must be used for care of patients known or suspected to be infected with pathogens spread by the airborne route. To provide protection against airborne pathogens masks must provide a snug fit and should be changed when they become moist or visibly soiled during use.

Specimens should be collected with gloved hands, placed in a correctly labelled leak proof container, enclosed in a sealed bag for transport with the request form in the outer sleeve pocket of the plastic bag to prevent contamination.

Reprocessing equipment
Cleaning is the essential first step for any form of reprocessing. If an item cannot be thoroughly cleaned, it cannot be reprocessed. Thorough cleaning with soap and water or alcohol impregnated wipes should occur as soon as practicable after use. Inadequate cleaning may result in ineffective disinfection or failure to sterilize instruments or equipment. Notify auxiliary staff of any extra or special cleaning required such as contaminated privacy curtains. Personal items such as stethoscopes require cleaning between individual patient use. Hospital crockery and cutlery require no special precautions. The combination of hot water and detergents used in hospital dishwashers is sufficient to render the items safe for reuse.

Environmental controls
A neutral detergent is the cleaning solution of choice for environmental surfaces. Extra cleaning may be necessary in the presence of some micro-organisms. Blood and body substance spills must be dealt with by wiping the area immediately with a paper towel and then cleaning the area with detergent and water if the spill is small. Large spills should be contained and in addition to cleaning with detergent and water, chlorine-generating disinfectants may be used.
Linen: Soiled linen is discarded into linen bags which when ⅔ full must be securely tied off for transport. Any linen bags likely to leak blood or body fluid must be contained by a clear plastic bag and secured prior to transport. Alternatively waterproof linen bags should be used. All used linen is considered contaminated therefore minimal handling is recommended.

Waste disposal
Standard Precautions must be employed when handling all waste. Waste is segregated at the point of generation into general, medical, cytotoxic, radioactive and hazardous streams. There is a legal obligation to classify waste appropriately.
Sharps: The person generating the sharp is responsible for its safe disposal. Sharps should never be passed by hand between health care workers. Disposal should occur immediately following its use and at the point of use into designated puncture resistant containers that conform to Australian Standard AS4031. Discard sharps containers when ½ full, seal appropriately and place in the medical waste stream. Never recap used needles unless an approved recapping device is used.
REFERENCES

Material in this tutorial was based on information found in the following references. We acknowledge and thank these sources of information. Students are also encouraged to refer to their hospital policy and procedure manuals for further guidelines.


**STUDENT NAME:** ……………………… **STUDENT NUMBER:** ……………………………

**DATE:** ………………… **TERM:** ……… **EXAMINER:** ………………………………..

**FORMATIVE ASSESSMENT FORM FOR ASEPTIC TECHNIQUE 2011 – SKILL A**

Not demonstrated = does not meet any of the criteria documented  
Demonstrated = meets all criteria – able to practice with minimal supervision.

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<tbody>
<tr>
<td>1.</td>
<td><strong>TIME TAKEN</strong></td>
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<td>Not rushed, but efficient.</td>
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<td>2.</td>
<td><strong>ASEPSIS TECHNIQUE</strong></td>
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<td>Collects, handles and opens equipment using sterile technique.</td>
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<td>3.</td>
<td><strong>HANDWASHING</strong></td>
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<td>Washes hands using correct technique.</td>
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<td>4.</td>
<td><strong>DONS STERILE GLOVES</strong></td>
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<td>Puts on gloves without contaminating gloves, other equipment.</td>
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<td>5.</td>
<td><strong>CLEANSING TECHNIQUE</strong></td>
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<td>Assesses wound and healing. Uses saline (or other cleaning solution) to cleanse wound/urethra and surrounding area, discarding swab after each stroke. Uses instruments correctly.</td>
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<td>6.</td>
<td><strong>DISPOSAL OF EQUIPMENT</strong></td>
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<td>Disposes of sharps and blood stained equipment appropriately, cleans area.</td>
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<td>7.</td>
<td><strong>PATIENT CARE</strong></td>
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<td>Ensures patient is left comfortably. Evaluates clinical status of patient and documents patient data accurately.</td>
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Intramuscular and Subcutaneous Injection

Outcomes
By the end of Level 4 the student will be able to:

Correctly give an intramuscular (IM) or subcutaneous (SC) injection as demonstrated by:

1. Explain procedure to patient using simple language
2. Obtain consent - explain risks
3. Discuss reasons for drug administration
4. Identify any patient drug allergies (with the patient and drug chart)
5. Choose and prepare correct equipment independently
6. With a second person check drug to be given against written orders noting drug name, time, frequency of administration, dose, route for administration, date of prescription order
7. Check expiry date
8. Draw up medication correctly
9. Identify patient verbally, cross check name and UMRN on identity band and drug chart with a second person
10. Assess clinical status of patient, recheck last time drug given
11. Identify appropriate injection site
12. Give the injection
   a. using aseptic technique (and following universal precautions)
   b. inserting needle to correct depth
   c. injecting all prescribed drug at correct rate
   d. with minimal discomfort to patient
13. Sign drug chart
14. Dispose of equipment safely
15. Record changes in clinical status of patient outside normal parameters
**TUTORIAL INFORMATION**

**Parenteral Administration of Medications using Subcutaneous and Intramuscular Injections**

**Subcutaneous Injection**

This involves placing medications into the loose connective tissue under the dermis. Absorption of the medication is somewhat slower than with intramuscular injections because subcutaneous tissue is not as richly supplied with blood. Medications are absorbed completely however if the patient’s circulatory status is normal. Subcutaneous tissue contains pain receptors, so the patient may experience some discomfort. The best subcutaneous injection sites include the outer posterior aspect of the upper arms, the abdomen from below the costal margins to the iliac crests, and the anterior aspects of the thighs (Figure 1). Other sites include the scapular areas of the upper back. The injection site chosen should be free of skin lesions, bony prominences and large underlying muscles or nerves.

![Figure 1- Commonly Used Subcutaneous Injection Sites](image)

Only small doses (0.5 to 1 mL) of water-soluble medications should be given subcutaneously, because the tissue is sensitive to irritating solutions and large volumes of medications. Collection of medications within the tissues can cause sterile abscesses, which appear as hard, painful lumps under the skin. The patient's body weight indicates the depth of the subcutaneous layer. Therefore you must choose the needle length and angle of insertion based on weight. Generally a 26-gauge 13 mm (½ - 5/8 inch needle inserted at a 45-degree angle (Figure 2), or a 90-degree angle (Figure 3) deposits medications into the subcutaneous tissue of a normal-sized patient. If the patient is obese, you can often pinch the tissue and use a needle long enough to insert through fatty tissue at the base of the skin fold. The preferred needle length is one-half the width of the skin fold. With this method the angle of insertion may be between 45 and 90 degrees. Thin patients may have insufficient tissue for subcutaneous injections. The upper abdomen is the best site for injection with this type of patient.
Absorption from this route is slow, resulting in a delayed onset of action (30 minutes) and prolonged effects.

**Intramuscular Injection**

The intramuscular route provides faster medication absorption than the subcutaneous route because of the greater vascularity of muscle. The usual absorption rate is about 10-20 minutes. The route is also commonly used for medications that irritate subcutaneous tissues. There is less danger of causing tissue damage when medications enter deeper muscle, but the risk exists of inadvertently injecting medications directly into blood vessels. Use a longer and heavier-gauge needle to pass through the subcutaneous tissue and penetrate deep muscle tissue. A 23 gauge needle is recommended. Weight and the amount of adipose tissue can influence needle size selection. For example, an obese patient may require a needle 75 mm (3 inches) long, and a thin client may only require a 25 – 50 mm (½ to 1 inch) needle.

The angle of insertion for an intramuscular injection is 90 degrees (Figure 3). Muscle is less sensitive to irritating and viscous medications. A normal, well-developed patient can tolerate 3 – 5 mLs of medication into a larger muscle without severe muscle discomfort. A larger volume of medication is unlikely to be absorbed properly. Children, older adults and thin patients can tolerate only 2 mL of an intramuscular injection.

**Intramuscular Injection Sites**

When selecting an intramuscular site, consider the following: is the area free from infection? Are there any local areas of bruising or abrasions? What is the location of underlying bones, nerves and major blood vessels? What volume of medication is to be administered?
**Ventrogluteal.** The ventrogluteal muscle is a safe site for all patients. It involves the gluteus medius and minimus and is situated deep and away from major nerves and blood vessels. The ventrogluteal site is the preferred injection site for adults and anyone over seven months old.

Locate the muscle by placing the heel of the hand over the greater trochanter of the patient’s hip with the wrist perpendicular to the femur. The right hand is used for the left hip, and the left hand is used for the right hip. Point the thumb towards the patient’s groin and fingers towards the patient’s head, point the index finger to the anterosuperior iliac spine, and extend the middle finger back along the iliac crest toward the buttock. The index finger, the middle finger, and the iliac crest form a V-shaped triangle, and the injection site is the centre of the triangle (Figure 4). The patient may lie on the side or the back. Flexing of the knee and hip helps the patient relax this muscle.

![Figure 4- Ventrogluteal Site for Intramuscular Injection](image)

**Vastus Lateralis.** The vastus lateralis muscle is another injection site used in the adult patient. The muscle is thick and well developed, is located on the anterior aspect of the thigh, and extends in an adult from a handbreadth above the knee to a handbreadth below the greater trochanter of the femur (Figure 5). The middle third of the muscle is the suggested site for injection. The width of the muscle usually extends between the midline of the thigh and the midline of the thigh’s outer side. With young children, it helps to grasp the body of the muscle during injection to be sure that the medication is deposited in muscle tissue. To help relax the muscle, ask the patient to lie flat with the knee slightly flexed. The injection can also be given while the patient is in the sitting position.
Dorsogluteal. The dorsogluteal muscle has been a traditional site for intramuscular injections; however, a risk exists of striking the underlying sciatic nerve or major blood vessels. Insertion of a needle into the sciatic nerve can cause permanent or partial paralysis of the involved leg. In patients with flabby, sagging tissues the site is often difficult to locate (Figure 6). This site is widely used in Australia, but because of the risk of injury to the patient, it is not recommended for use.

Deltoid. Although the deltoid site is easily accessible, in many adults this muscle is not well developed. The radial and ulnar nerves and the brachial artery lie within the upper arm along the humerus (Figure 7 A). You should use this site only for small volumes of medication, or when other sites are inaccessible because of dressings etc.

To locate the deltoid muscle, fully expose the patient’s upper arm and shoulder. A tight-fitting sleeve should not be rolled up. Ask the patient to relax the arm by flexing the elbow. Palpate the lower edge of the acromion process, which forms the base of the inverted triangle in line with the midpoint of the lateral aspect of the upper arm. The injection site is in the centre of the triangle, about 2.5 to 5 cm below the acromion process (Figure 7 A and B). You can also locate the site by placing four fingers across the deltoid muscle, with the top finger along the acromion process. The injection site is then three finger-widths below the acromion process.
REFERENCES:
Potter and Perry’s Fundamentals of Nursing (Australian edition) 2001 Harcourt

Cook, IF and Mutagh, J. Optimal techniques for intramuscular injection of infants and toddlers: a randomised trial. MJA 2005; 183(2): 60-63

The Centre for Anaesthesia Skills & Medical Simulation

Drawing Up Medications from an Ampoule or Vial

<table>
<thead>
<tr>
<th>Equipment</th>
<th></th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication in an ampoule</td>
<td>Medication in a vial</td>
<td></td>
</tr>
<tr>
<td>• Syringe and two needles</td>
<td>• Syringe and two needles</td>
<td></td>
</tr>
<tr>
<td>• Small gauze pad or alcohol swab</td>
<td>• Small gauze pad or alcohol swab</td>
<td></td>
</tr>
<tr>
<td>• Diluent (e.g. normal saline or sterile water)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review order, including patient name, medication name, dose, route of administration, and time of administration</td>
</tr>
<tr>
<td>2. Review pertinent information related to medication, including action, purpose, and side effects.</td>
</tr>
<tr>
<td>3. Check date of expiration for medication vial or ampoule.</td>
</tr>
<tr>
<td>4. Assess patient’s body build, muscle size, and weight.</td>
</tr>
<tr>
<td>5. Wash hands.</td>
</tr>
</tbody>
</table>

6. **Prepare medication.**

   **A. Glass ampoule preparation**
   1. Tap top of ampoule lightly and quickly with finger until fluid moves from neck of ampoule.
   2. Place small gauze pad around neck of ampoule.
   3. Snap neck of ampoule quickly and firmly away from hands.
   4. Draw up medication quickly.
   5. Hold ampoule upside down, or set it on a flat surface. Insert needle into centre of ampoule opening. Do not allow needle tip or shaft to touch rim of ampoule.
   6. Aspirate medication into syringe by gently pulling back on plunger.
   7. Keep needle tip under surface of liquid. Tip ampoule to bring all fluid within reach of the needle.
   8. If air bubbles are aspirated, do not expel air into ampoule. Push plunger upward to eject air. Do not eject fluid.
   9. To expel excess air bubbles, remove needle from ampoule. Hold syringe with needle pointing up. Tap side of syringe to cause bubbles to rise toward needle. Draw back slightly on plunger, and then push.
   10. If syringe contains excess fluid, use sink for disposal. Hold syringe vertically with needle tip up and slanted slightly toward sink. Slowly eject excess fluid into sink. Recheck fluid level in syringe by holding it vertically.
   11. Change needle on syringe.

   **B. Plastic ampoule preparation**
   1. Hold ampoule upright.
   2. Grasp twist off end of ampoule between index finger and thumb and main body of ampoule with other hand.
   3. Break off ampoule tip using back and forth motion in the direction of the arrows on the end and then twist to open.
Drawing Up Medications from an Ampoule or Vial (Continued)

Steps

(4) Discard twist off end.

(5) Draw up medication slowly:
   i. remove syringe from pack and draw an amount of air into syringe that is equivalent to the amount of fluid contained in the ampoule.
   ii. plug syringe onto open end of ampoule.
   iii. hold syringe and ampoule together with ampoule above syringe
   iv. moving plunger in and out, not more than half of volume each time, to exchange fluid for air.

C. Vial containing a solution

(1) Remove cap covering top of unused vial to expose sterile rubber seal, keeping rubber seal sterile.

(2) Pick up syringe and remove needle cap. Pull back on plunger to draw amount of air into syringe equivalent to volume of medication to be aspirated from vial.

(3) With vial on flat surface, insert tip of needle with bevelled tip entering first through centre of rubber seal. Apply pressure to tip of needle during insertion.

(4) Inject air into the vial’s airspace, holding on to plunger. Hold plunger with firm pressure; plunger may be forced backward by air pressure within the vial.

(5) Invert vial while keeping firm hold on syringe and plunger. Hold vial between thumb and middle fingers of non-dominant hand to counteract pressure in vial.

(6) Keep tip of needle below fluid level.

(7) Allow air pressure from the vial to fill syringe gradually with medication. If necessary, pull back slightly on plunger to obtain correct amount of solution.

(8) When desired volume has been obtained, position needle into vial’s airspace; tap side of syringe barrel carefully to dislodge any air bubbles. Eject remaining air at top of syringe into vial.

(9) Remove needle from vial by pulling back on barrel of syringe.

(10) Hold syringe at eye level, at 90-degree angle, to ensure correct volume and absence of air bubbles. Remove any remaining air by tapping barrel to dislodge any air bubbles. Draw back slightly on plunger; then push plunger upward to eject air. Do not eject fluid.

(11) If medication is to be injected into patient’s tissue, change needle to appropriate gauge and length according to route of medication.

D. Vial containing a powder

(1) Remove cap covering vial of powdered medication and cap covering vial of proper diluent.

(2) Draw up diluent into syringe following steps 6A(2) – 6A(10).

(3) Insert tip of needle through centre of rubber seal of vial of powdered medication. Inject diluent into vial. Remove needle.


(5) Reconstituted medication in vial is ready to be drawn into new syringe. Read label carefully to determine dose after reconstitution.

7. Dispose of soiled supplies.

Place broken ampoule and/or used vials and used needle in puncture-proof and leakproof container. Clean work area / wash hands.
Administering Intramuscular & Subcutaneous Injections

**Equipment**
- Proper size syringe and needle:
  - SC: Syringe (1 to 3mL) and needle (27 to 25 gauge, 3/8 to 5/8 in)
  - IM: Syringe 2 to 3 mL for adult, 0.5 to 1 ml for infants and small children. Two needles: 21 to 23 gauge, 1 to 1 ½ in. for adults; 1 in. for children.
- Small gauze pad and/or alcohol swab.
- Vial or ampoule of medication.
- Injection tray
- Disposable gloves.
- Documentation.

**Steps**

**For All Injections**
1. Review prescriber’s medication order for patient’s name, medication name, dose, time and route of administration.
2. Assess patient’s history of allergies substances patient is allergic to and form of allergic reaction.
3. Observe verbal and non-verbal responses toward receiving injection.
4. Assess for contraindications:
   A. **For subcutaneous injections**
      Assess for factors such as circulatory shock or reduced local tissue perfusion.
      Assess adequacy of patient’s adipose tissue.
   B. **For intramuscular injections**
      Assess for factors such as muscle atrophy, reduced blood flow, or circulatory shock.
5. Prepare correct medication dose from ampoule or vial. Check carefully. Be sure all air is expelled.
6. With a second person identify patient; check identification bracelet and ask patient their name and date of birth or address.
7. Explain steps of procedure and tell patient injection will cause a slight burning or sting.
8. Close room curtain or door.
9. Wash hands thoroughly; apply disposable gloves.
10. Keep sheet or gown draped over body parts not requiring exposure.
11. Select appropriate injection site. Inspect skin surface over site for bruises, inflammation, or oedema.
   A. SC: Palpate sites for masses or tenderness. Avoid these areas. Consider rotating sites daily. Be sure needle is correct size by grasping skinfold at site with thumb and forefinger. Measure fold from top to bottom. Needle should be one-half length.
   B. IM: Note integrity and size of muscle and palpate for tenderness or hardness. Avoid these areas. If injections are given frequently, rotate sites.
12. Assist patient to comfortable position:
   A. SC: Have patient relax arm, leg, or abdomen, depending on site chosen for inspection.
   B. IM: Have patient lie flat, on side, or prone, depending on site chosen.
   C. Talk with patient about subject of interest.
Administering Intramuscular & Subcutaneous Injections (Continued)

Steps
13. Relocate site using anatomical landmarks.
14. Cleanse site with antiseptic swab. Apply swab at centre of the site and rotate outward in a circular direction for about 5cm.
15. Hold swab or gauze between third and fourth fingers of non-dominant hand.
16. Remove needle cap or sheath from needle by pulling it straight off.
17. Hold syringe between thumb and forefinger of dominant hand
   A. SC: Hold as dart, palm down or hold syringe across tops of fingertips.
   B. IM: Hold as dart, palm down.
18. Administer injection:
   A. Subcutaneous
      (1) For average-size patient, spread skin tightly across injection site or pinch skin with non-dominant hand.
      (2) Inject needle quickly and firmly at 45- to 90-degree angle. Then release skin, if pinched.
      (3) For obese patient, pinch skin at site and inject needle at 90-degree angle below tissue fold.
      (4) After needle enters site, grasp lower end of syringe barrel with non-dominant hand. Move dominant hand to end of plunger. Avoid moving syringe while slowly pulling back on plunger to aspirate drug. If blood appears in syringe, remove needle, discard medication and syringe, and repeat procedure.
      (5) Inject medication slowly.
   B. Intramuscular:
      (1) Position non-dominant hand at proper anatomical landmarks.
      (2) If patient’s muscle mass is small, grasp body of muscle between thumb and fingers.
      (3) Insert needle quickly at 90-degree angle to muscle. Aspirate as in Step 18A(4).
      (4) Inject medication slowly.
      (5) Wait 10 sec. Then smoothly and steadily withdraw needle and release skin.
19. Withdraw needle while applying alcohol swab or gauze gently over site. Support of tissue around injection site minimises discomfort during needle withdrawal.
20. Do not massage IMI site.
21. Assist patient to comfortable position.
22. Discard uncapped needle (or needle enclosed in safety shield) and attached syringe into puncture and leakproof receptacle. If a sharps container is not immediately available transport to nearest receptacle in injection tray.
23. Remove disposable gloves and wash hands.
24. Stay with patient 3 to 5 min and observe for any allergic reactions.
25. Return to patient and ask if patient feels any acute pain, burning, numbness, or tingling at injection site.
26. Inspect site, noting any bruising or induration.
27. Return to evaluate patient’s response to medication in 10 to 30 min, IM medications absorb quickly; undesired effects may also develop rapidly.
28. Ask patient to explain purpose and effects of medication.

Recording and Reporting
• Chart medication dose, route, site, time, and date given in medication record.
• Report any undesirable effects from medication and patient’s response to medication.
FORMATIVE ASSESSMENT FORM FOR IM & SC INJECTIONS 2011 – SKILL A

Not demonstrated = does not meet any of the criteria documented
Demonstrated = meets all criteria – able to practice with minimal supervision

1. EXPLANATION AND CONSENT
Introduce self. Describe the procedure to the patient; make sure the patient understands the reason for the procedure. Give opportunity to ask questions. Obtain permission to perform the procedure. Ensure minimal discomfort to patient.

2. LANGUAGE AND BEHAVIOUR
Use simple English, easy to understand, no jargon. Language is appropriate, professional. Behaviour is appropriate, including proximity to patient at all times, positions the patient appropriately, ensures comfort and privacy.

3. TIME TAKEN
Not rushed, but efficient.

4. ASEPSIS
Washes hands, uses aseptic technique.

5. COLLECTION OF EQUIPMENT
Takes all required equipment to the bedside.

6. CHECKS IDENTITY
With a second person checks drug to be given against written orders noting drug name, time, frequency of administration, dose, route for administration, date of prescription order.

7. AT THE BEDSIDE
Identify patient verbally, cross check name and UMRN on identity band and drug chart with a second person. Assess clinical status of patient, recheck last time drug given.

8. ADMINISTRATION
Chooses appropriate site - can verbalise reasons for selection. Inserts needle to correct depth, injects drug at correct rate, withdraws needle correctly, applies appropriate cover/pressure. Minimises patient discomfort.

9. DISPOSAL OF EQUIPMENT
Disposes of sharps and blood stained equipment appropriately, cleans area.
Intravenous Therapy

Outcomes
By the end of Level 4 the student will be able to
1) Correctly insert an intravenous (IV) line by
   a) Explaining procedure to a patient
   b) Obtaining verbal consent from the patient - explaining risks
   c) Choosing and preparing equipment independently
   d) Choosing insertion site
   e) Inserting IV
      i) using aseptic technique
      ii) with minimal discomfort to patient
   f) Connecting fluid therapy without assistance
   g) Disposing of equipment safely
VEINS & CANNULATION SITE SELECTION

Vein Anatomy & Physiology - The structure of veins

Veins have three layers.
- **Tunica intima** (inner layer) consists of an elastic endothelial lining which also forms the valves. Valves are semilunar folds of epithelium and their function is to keep the blood flowing towards the heart. They occur more frequently at junctions and can be observed as a small bulge in the veins. Valves can interfere with the withdrawal of blood as well as the advancement of a cannula and should be avoided in intravenous cannulation.

- The **tunica media** (middle layer) consists of muscular and elastic tissue, as well as nerve fibres. These keep the vessels in a state of tonus and stimulate the vein to contract and relax. Stimulation by a change in temperature or by mechanical or chemical irritation may produce venous spasm, which impedes the flow of blood and causes pain. Application of heat promotes vasodilation, relieves spasm and improves blood flow, which in turn relieves the pain.

- The **tunica adventitia** (outer layer) consists of areolar connective tissue which surrounds and supports the vessel.

The skin consists of the epidermis and the dermis, which is highly sensitive and vascular and contains nerve fibres, which react to temperature, pressure and pain.

Arteries tend to be positioned much more deeply than veins but occasionally can be located in an unusual place, superficially (aberrant artery). Arteries pulsate.

The superficial veins of the upper extremities are used for cannulation because they are located just beneath the dermis in the superficial fascia.

Site Choice

Successful IV therapy depends on selecting the best possible cannulation site. Carefully examine both arms for the most appropriate vessels. Most commonly used veins for placement of IV cannulae are the **metacarpal, cephalic and basilic** veins (Figures 1 & 2). Provide comfort to the patient and extra lighting. Palpate likely veins to be used.

Use the same two fingers for palpation, this will increase their sensitivity. The most prominent vein is not necessarily the most suitable. The most distal site of the extremity should be selected, although this will depend on the condition of the vein.

Consider:
- Location and condition of the vein:
a. Size and nature of vessels
b. Flat surface
c. Into ‘Y’ junction
d. Choose largest vessel (Match size of cannula to reason for cannulation and choice of vessel)
e. Proximal to previous attempts
f. Avoiding infection, inflammation or injury
   • Reason for cannulation – will influence size of vessel required and choice of cannula.
   • Duration of therapy

Other factors influencing vein choice:

If long-term IV therapy is required, get maximum use from arm veins by starting the therapy in a hand vein and then progressing to sites farther along the arm as necessary.
- Age of patient
- Hand dominance: if possible choose a vein in the non-dominant hand
- Weight: obese/malnourished
- Clinical status of the patient: e.g. dehydrated, shocked, amputee, mastectomy, oedema, thrombocytopenia, stroke, leucocytopenia.
- Other clinical procedures required during admission
- Type and length of treatment
- Medications: warfarin/steroids
- Patient co-operation/previous experiences/preference
- Previous uses and condition of the veins

○ **Condition of the vein:**
  A good vein:
  - Is soft and bouncy
  - Refills when depressed
  - Is visible
  - Has a large lumen
  - Is straight and well supported

○ **Veins to avoid:**
  A vein to avoid may be:
  - Thrombosed/sclerosed/fibrosed (A thrombosed vein may be detected by a lack of resilience and hard, cord-like feeling).
  - Inflamed/bruised
  - Hard
  - Thin/fragile
  - Mobile/tortuous
  - Near bony prominences, painful areas or sites of infection, oedema or phlebitis, or may
  - Have undergone multiple punctures
Figure 1 Anterior arm and hand
Figure 2 Posterior hand
Peripheral Intravenous Cannulae

The most commonly used device for peripheral IV therapy is the over-the-needle cannula which consists of a plastic outer cannula and an inner needle that extends just beyond the cannula. The needle pulls out after insertion, leaving the cannula in place. Once withdrawn the needle tip must not be reinserted into the cannula as cannula damage is likely. Available in lengths of 1” (2.5 cm), 1 ¼ “ (3 cm), and 2” (5 cm) and gauges from 14G to 26G, over-the-needle cannulae are used mainly for long-term therapy for the active or agitated patient.

There is a variety of cannulae available (See Figure 3). Some include a sharps protection mechanism. Each type of cannula has a slightly different way of being used. It is important that you are familiar, comfortable and competent with the type that is in your workplace.

Cannula Gauge Selection

It is generally recommended that you choose a device with the shortest length and the smallest diameter that allows you to carry out therapy appropriately. A larger cannula occludes the flow of blood, leading to chemical phlebitis from irritating solutions, or mechanical phlebitis from friction exerted by the cannula on the intima of the vein. Smaller cannulae allow better flow around the cannula, improving haemodilution and minimising insertion trauma.

Other considerations include:

- High flow rates or irritant drugs require a large vein and a good blood flow, however large cannulae can occlude veins and damage intima.
- the duration that the device will remain in place
- the purpose of therapy, such as drug administration, transfusions, or parenteral nutrition
- the type of procedure or surgery anticipated
- the patient’s activity level
- the patient’s age
- the type of intravenous solution or medication to be administered (e.g. blood and blood products require a larger gauge devices, such as a 20G or larger)
- the veins available for venepuncture and their condition
<table>
<thead>
<tr>
<th>Colour</th>
<th>Gauge</th>
<th>Application</th>
</tr>
</thead>
</table>
| Orange | 14G   | • Fluid resuscitation, rapid infusions, trauma, high-risk surgical procedures  
**Considerations:**  
• Large gauge cannulae increase likelihood for painful insertion (consider local anaesthesia as per local protocols).  
• Requires a vein large enough to accommodate the cannula.  
• Depending on location, larger cannula sizes can cause increased mechanical irritation to the vein wall. |
| Grey   | 16G   | • Fluid resuscitation, rapid infusions, trauma, high-risk surgical procedures  
**Considerations:**  
• Large gauge cannulae increase likelihood for painful insertion (consider local anaesthesia as per local protocols).  
• Requires a vein large enough to accommodate the cannula.  
• Depending on location, larger cannula sizes can cause increased mechanical irritation to the vein wall. |
| Green  | 18G   | • Surgery  
• Improved flow rates for viscous solutions and whole blood/red cell transfusions  
• Rapid infusions  
• Various emergency situations.  
**Considerations:**  
• Requires vein large enough to accommodate cannula. |
| Pink   | 20G   | • Suitable for most routine infusions  
• Minor surgical procedures, routine outpatient procedures requiring IV access.  
**Considerations:**  
• Versatile in use  
• Frequently selected gauge size |
| Blue   | 22G   | • Suitable for most infusion; i.e., delivery of antibiotics, hydration therapy at slower rates.  
• Red cell components may not flow as freely.  
• Recommended for small and/or fragile veins.  
**Considerations:**  
• Easier to insert into small, thin, fragile veins.  
• Easily accommodates routine administration of antibiotics and hydration therapies at slower flow rates.  
• Not appropriate gauge if rapid flow rates are required  
• May be difficult to insert into tough skin. |
| Yellow | 24G   | • Suitable for most infusions but flow rates are slower.  
**Considerations:**  
• Neonatal, paediatric and elderly patients.  
• Extremely small veins when larger veins are not accessible.  
• May be difficult to insert into tough skin. |
Performing Intravenous Cannulation

Equipment Preparation

To perform the cannulation procedure you will need the following equipment:
(Many clinical areas have IV Trolleys stocked with all the required equipment)

- Alcohol swab
- An absorbent pad e.g. “bluey”
- Gloves
- Tourniquet,
- Two cannulae (an extra one in case of contamination or miss)
- A transparent semipermeable dressing and suitable tapes for securing the cannula
- Sterile gauze swabs
- Non-allergenic tape
- Sharps container
- IV solution (attached to the primed administration set) or IV bung
- IV flush (0.9% normal saline)
- Local anaesthetic

Before proceeding, if an infusion is required, place the prepared IV solution and the administration set close to the patient and high enough for gravity to provide the proper flow rate. Then wash your hands, explain the procedure to the patient and gain consent.

To select the best insertion site on the arm or hand, place the patient’s arm (preferably the non-dominant one) in a dependent position, which will increase capillary filling in the lower arm and hand. If the patient's skin feels cold, rub and stroke the area to warm it, then apply a tourniquet.

Psychological Effects of Cannulation

- Obtain consent and ask if patient has undergone the procedure before. Fear of the procedure could produce a vaso-vagal effect resulting in syncope and vasoconstriction and subsequent limited venous access.
- Provide reassurance: Explain the procedure and its purpose.

Improving Venous Access

The following techniques may help improve venous access:
- application of tourniquet promotes venous distension – allow time for veins to fill
- lowering the extremity below the level of the heart
- opening and closing the fist
- light tapping along the vessel
- application of heat
- GTN patches

Local Anaesthetics

Insertion of a cannula can hurt. If you have plenty of time a topical anaesthetic cream, such as EMLA (Lignocaine and prilocaine) can be applied. A thick layer should be applied to the skin and covered with an occlusive impermeable dressing for one to three hours (a minimum of one hour). A dose of 1.5g/10 cm² is recommended. The minimum duration of anaesthesia is one hour after removal of the occlusive dressing. EMLA cream is contraindicated in patients hypersensitive to prilocaine, lignocaine or any local anaesthetics of the amide type, and in children less than 6 months old.
Alternatively, a small amount of local anaesthetic (1% or 2% lignocaine) can be injected subcutaneously prior to the insertion of the cannula. This is a more practical option if there is not time to allow a topical anaesthetic to become effective.

**Unsuccessful Cannulation**

Two unsuccessful insertion attempts suggest following attempts should be made by someone more experienced. Multiple unsuccessful attempts limit future vascular access cause unnecessary discomfort for the patient, and may also affect the confidence of the practitioner. If bruising occurs while cannulation is being performed, remove the tourniquet immediately. The vein may have been punctured and the device needs to be removed. Pressure applied to the site and application of a cold pack to the haematoma may be required.

**Maintaining the IV site.**

Change the dressing and inspect the IV site with each use or once every 8 hours. Assess for redness, swelling, warmth, tenderness, and drainage. Follow the local policy for your facility.

IV cannulae should generally be replaced every 72 hours. Follow the local policy for your facility.
<table>
<thead>
<tr>
<th>STAGES</th>
<th>KEY POINTS</th>
<th>RATIONALE</th>
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<tbody>
<tr>
<td>2. Prepare equipment</td>
<td>1. Select: tourniquet; alcohol swabs; transparent occlusive dressing; adhesive tape; adapter plug; sharps container; 5ml syringe, normal saline amp, cannulae.</td>
<td>Gravity assists venous distension by pooling of blood.</td>
</tr>
<tr>
<td>3. Prepare venepuncture site</td>
<td>1. Place patient’s arm in a dependent position.</td>
<td>Stabilise vein by minimising movement during insertion.</td>
</tr>
<tr>
<td></td>
<td>2. Apply tourniquet.</td>
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<td></td>
<td>3. Check radial pulse still present.</td>
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<td>4. Select most suitable vein, visible or palpable.*</td>
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<td>5. Select appropriate cannula size.</td>
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<td>6. Wipe selected site thoroughly using an alcohol swab and allow to dry.</td>
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<tr>
<td>4. Insert IV cannula</td>
<td>1. Remove cannula from package.</td>
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<td></td>
<td>2. Using free hand, stretch skin local and distal to point of entry.</td>
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<td></td>
<td>3. Align needle above vein at 10° and 30° angle with bevel facing upwards.</td>
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<td>4. Warn patient re needle prick.</td>
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<td>5. Insert needle firmly through the skin until ‘pop’ or ‘give’ sensation (loss of resistance) as needle enters vein.</td>
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<td>6. Check for blood flow in cannula hub.</td>
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<td>7. Reduce angle of needle to skin, advance tip a further 4-5mm.</td>
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<td>8. Slide cannula smoothly over needle into vein, up to hub.</td>
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<td>9. Release skin tension and use fingers to compress entered vein beyond tip of cannula.</td>
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<td></td>
<td>10. Release tourniquet.</td>
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<td>11. Withdraw needle while holding cannula hub.</td>
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<td>12. Place needle stylet in sharps container.</td>
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<td>13. Cap off cannula with adapter plug.</td>
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<tr>
<td>5. Ensure cannula patency</td>
<td>1. Flush with 5ml of normal saline or connect IV giving set directly and run fluid through to confirm cannula patency.</td>
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</tr>
<tr>
<td>7. Dispose of used equipment</td>
<td>1. Clean up and remove all used equipment, being careful of ‘sharps’- never recap needles.</td>
<td></td>
</tr>
</tbody>
</table>

NOTES: * Venous distension can be assisted by:
- the patient opening and closing their fist; gently tapping or vigorous rubbing with hand or alcohol swab.
## Complications of Peripheral Intravenous Cannulation

### Local Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catheter Dislodgement</td>
<td>Poor taping technique / patient pulling on cannula</td>
</tr>
<tr>
<td>Infiltration (tissuing)</td>
<td>Cannula dislodged from or perforated vein</td>
</tr>
<tr>
<td>Occlusion</td>
<td>IV flow interrupted because of kinking of tubing, blood backflow in line or IV site not flushed</td>
</tr>
<tr>
<td>Haematoma</td>
<td>Vein punctured through opposite wall at time of insertion</td>
</tr>
<tr>
<td></td>
<td>Leakage of blood from needle displacement</td>
</tr>
<tr>
<td></td>
<td>Inadequate pressure applied when cannula removed</td>
</tr>
<tr>
<td>Nerve, tendon or ligament damage</td>
<td>Improper venepuncture technique resulting in damage to surrounding tissues.</td>
</tr>
<tr>
<td></td>
<td>Tight taping or improper splinting</td>
</tr>
<tr>
<td>Vein irritation or pain at IV site</td>
<td>Some medications, commonly antibiotics</td>
</tr>
<tr>
<td>Venospasm</td>
<td>Severe vein irritation from irritating drugs or fluids</td>
</tr>
<tr>
<td></td>
<td>Very rapid flow rates</td>
</tr>
<tr>
<td>Phlebitis</td>
<td>Poor blood flow around cannula.</td>
</tr>
<tr>
<td></td>
<td>Friction from cannula movement</td>
</tr>
<tr>
<td></td>
<td>Cannula left in vein too long</td>
</tr>
<tr>
<td></td>
<td>Medication irritation</td>
</tr>
<tr>
<td>Thrombophlebitis</td>
<td>Clotting at cannula tip and inflammation</td>
</tr>
<tr>
<td>Severed Catheter</td>
<td>Reinsertion of needle into cannula</td>
</tr>
</tbody>
</table>

### Systemic Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Possible causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air embolism</td>
<td>Solution container empty and air is drawn into the infusion line</td>
</tr>
<tr>
<td>Circulatory overload</td>
<td>Roller clamp loosened to allow run-on infusion.</td>
</tr>
<tr>
<td></td>
<td>Flow rate too rapid.</td>
</tr>
<tr>
<td></td>
<td>Miscalculation of fluid requirements</td>
</tr>
<tr>
<td>Allergic reaction</td>
<td>Patient allergy to medication</td>
</tr>
<tr>
<td>Systemic infection (septicaemia or bacteraemia)</td>
<td>Failure to maintain aseptic technique during cannula insertion</td>
</tr>
<tr>
<td></td>
<td>Failure to rotate site</td>
</tr>
<tr>
<td></td>
<td>Prolonged use</td>
</tr>
<tr>
<td>Vaso-vagal reaction</td>
<td>Vasospasm from anxiety or pain</td>
</tr>
</tbody>
</table>
### Formative Assessment Form for IV Insertion 2011 – Skill A

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>Not Demonstrated</th>
<th>Demonstrated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Explanation and Consent</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduce self. Describe the procedure to the patient, make sure the patient understands the reason for the procedure. Give opportunity to ask questions. Obtain permission to perform the procedure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Explanation and Feedback</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe what you are about to do and what you are doing during the procedure. Ensure minimal discomfort to patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. Language and Behaviour</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use simple English, easy to understand, no jargon. Language which is appropriate, 'politically correct', professional. Behaviour which is appropriate, including proximity to patient at all times.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. Time Taken</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not rushed, but efficient.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5. Site Selection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose appropriate site – can verbalise reasons for selection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6. Asepsis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washes hands, uses antiseptic at site (waits to dry), wears gloves.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7. Collection of Equipment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takes all required equipment to the bedside.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8. Insertion Technique</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infiltrates with local anaesthetic, uses tourniquet, inserts cannula with bevel uppermost, utilizes flashback, secures cannula with transparent dressing and tape.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9. Disposal of Equipment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposes of sharps and blood stained equipment appropriately, cleans area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10. Commence IV Fluid Therapy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connects IV line and fluid therapy to cannula correctly.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SKILL B

Phlebotomy

Skill Training Program 2011

Outcomes
By the end of supervised practical the student will be able to:

1. Describe the basic test and transportation requirements of specimen collection.
2. Demonstrate basic venepuncture techniques with the minimum discomfort and trauma to the patient following Standard Precautions throughout.
   a. Explain procedure to a patient using simple language
   b. Obtain consent - explain risks
   c. Identify the patient with Full Name, Date of Birth and UMRN, cross-checking against request form
   d. Choose and prepare correct equipment independently
   e. Perform basic venepuncture techniques correctly
   f. Label specimens correctly
   g. Dispose of equipment safely
   h. Check patient’s collection site and dress appropriately

3. Apply the knowledge gained to the safe collection of specimens for diagnostic and therapeutic services, in order that accurate and meaningful results may be achieved.

Teaching  Why, how and when? The theory behind safe venepuncture practice.
Introductory Practical Workshop
Practical sessions (minimum 6hrs) during Medicine and Surgery attachments

Assessment  Theory test during the practical sessions. Demonstrated practical ability. Each student will be observed during attendance at follow up practical sessions.
TUTORIAL

1. PATIENT IDENTIFICATION

It is essential to identify the patient PRIOR to collection so that we don’t bleed the wrong patient. Each patient is asked to provide information that is checked against the request form.

Out-patients arrive with a ‘legal’ request form

- check that the request is correctly filled-out and signed
- call patient by name and direct them to a bleeding chair
- POSITIVELY IDENTIFY THE PATIENT by asking the patient for their FULL NAME and their DATE of BIRTH or ADDRESS*

This information must be checked against the patient identification on the request form. Any errors in identification must be corrected prior to collection.

*DO NOT GIVE THE PATIENT INFORMATION AND ASK FOR VALIDATION

In-patients

- check that the UMRN and surname on the request matches the UMRN and surname on the ID bracelet of the patient
- Ask the patient for their FULL NAME and their DATE of BIRTH or ADDRESS*

*DO NOT GIVE THE PATIENT INFORMATION AND ASK FOR VALIDATION

Unconscious patients

Patients in a state of unconsciousness and patients unable to identify themselves should be identified as follows:

- Check the name and UMRN from the ID bracelet
- Ask nursing staff to identify the patient as a cross check

Specimens for Transfusion Medicine

It is essential that prior to the collection of a specimen for cross-match or group and hold, all identification particulars are checked with the patient, ie UMRN full name, DOB, and address. Any discrepancies must be corrected prior to collection. The collector must initial pre-printed ID labels applied to these specimens. Check local policy as specimen labelling requirements vary.

IT IS THE RESPONSIBILITY OF THE PERSON COLLECTING THE BLOOD TO ENSURE THAT THE CORRECT PATIENT IS BLED.

2. STANDARD PRECAUTIONS & SAFETY ISSUES

Standard Precaution guidelines are based on the premise that each patient is potentially infectious, therefore precautions are practiced to minimise the spread of infection.

All patients are treated in the same way unless they are nursed under Additional Precautions. All Additional Precaution instructions must be followed before, during and post patient interaction.
Intact skin is the most important barrier in preventing the spread of infection and hand washing is the most important Standard Precaution practice. Hand washing should be practiced before and after each patient contact.

When collecting blood or other specimens a new pair of gloves should be worn for each patient contact.

**Sharps Injuries and Splashes**

If you receive a sharps injury or a splash to a mucous membrane:
- Promptly wash away the blood or body fluid and encourage bleeding.
- Use soap, except for the eyes and mouth and rinse well with water.
- Report the incident to your Supervisor as soon as possible.
- Follow the Sharps Injury Policy.

### 3. IDENTIFICATION OF TESTS AND TEST CONDITIONS

There are hundreds of blood tests available and countless combinations of tests possible. Tests are requested to confirm diagnosis, and to monitor the treatment of disease. Tests are usually written in an abbreviated form and may take a little time to understand. Clinical history can help in identifying tests. Guesswork often leads to repeated venepuncture and increased harm to the patient.

When all else fails ask someone more experienced for their interpretation.

**Test conditions MUST be checked before the sample is taken.** This minimises trauma to the patient and ensures that results are accurate and reliable.

- Test conditions may be requested by the medical officer writing the request or may be an essential element of the actual test.

  - **Fasting cholesterol** - choice of requesting MO
  - **Fasting special lipids** - essential element of test

- Some tests MUST be collected at a specific time.

  - **Digoxin level** - at least 6 hours post last dose

- Some tests must be delivered within a specific time frame to ensure reliable and accurate results.

  - **Ammonia** - to the lab within 10 minutes
  - **Homocysteine** - to the lab immediately

A list of test conditions can be found on the hospital laboratory Intranet, in the Specimen Collection Manual and in the memory of phlebotomists. (Some are more user-friendly than others!)

### CHOICE OF EQUIPMENT

All hospitals and pathology practices in Western Australia use the evacuated system of blood collection. When the system is used correctly it provides the cleanest, safest and most cost effective method of phlebotomy with the added assurance of collection of quality blood samples.
The evacuated collection system requires the correct tubes for the tests requested being selected prior to commencing blood collection.

To prevent contamination and to produce accurate results, tubes should be collected in the following order:

- Tubes without anticoagulants (at RPH - S, 6HSST, TM)
- Citrate tubes (coagulation tube) (at RPH - citrate)
- Tubes with other anticoagulants (at RPH - PST, ACD, 7HH, ESR)
- EDTA tubes (at RPH - EDTA, 9EDTA)

All tubes must be allowed to 'fully draw' before being removed from the needle holder. Insufficient sample may result in a test not being assayed, and results being inaccurate.

All tubes MUST be inverted at least 6 times after collection. This ensures that the blood is thoroughly mixed with the contents of the tube.

When collecting samples with needle and syringe, it is essential that the needle is removed and the tops of the tubes removed prior to gently siphoning the blood from syringe to the tubes. Tops are then replaced and the tubes are inverted at least 6 times.

5. BASIC VENEPUNCTURE TECHNIQUE

The following serves as a guide to technique and order of steps. You will receive a practical demonstration on correct technique and opportunity to practice this.

While gaining confidence it is suggested that step 1 is done immediately prior to calling in the patient.

1. Attach needle to needle holder and place in kidney dish. Place alcohol swab, dry swab, and tubes required in same kidney dish. (Seat patient in bleeding chair, identify then check test conditions.)

2. Apply tourniquet approximately 12cm above the collection site.

3. Put on gloves and palpate for a suitable site in the antecubital fossa of the arm to be used.

4. Swab site with alcohol prep and dry.

5. Anchor vein, and insert needle, bevel up, 15° angle to the skin, directly over and in line with the vein.

6. Holding needle firmly against the arm with one hand, push the first tube onto the multisampling needle using a hypodermic action.

7. When the tube is fully drawn, remove the tube from the needle holder by pushing against the wings of the needle holder and pulling gently.

8. Repeat steps 5 & 6 until all tubes have been collected.
9. Release tourniquet, remove needle from vein, and apply firm pressure to the site with a clean dry swab.

10. Dispose of sharps immediately into an appropriate sharps container.

11. Invert all tubes at least 6 times.

12. Label tubes, record date and time then sign the request form. Note the number of each type of tube on the request form.

13. Place the specimens in a Biohazard-bag and seal. Place the completed form in the outside envelope of the bag.

14. Check the venepuncture site and apply a clean, dry dressing with tape.

15. Farewell the patient.

16. Dispose of other equipment in the gloves by grasping the material and pulling glove over, then dispose in the bin.

17. Wash hands and dry thoroughly.

18. Transport specimens to the laboratory immediately.

6. DISPOSAL OF EQUIPMENT

It is essential to dispose of any sharps immediately after use into a suitable Sharps Container. Do not place in a kidney dish or hand to another person.

Phlebotomy trays and trolleys are available in all wards and departments. Each tray has a specially designed space into which the sharps container fits. Use of this facility minimises the risk of removing needles provided attention is given to the procedure. Please make sure, prior to use, that the appropriate sharps container is fitted into this space and is not over full.

NEVER RESHEATH A NEEDLE

Swabs, syringes and needle caps should not be placed into the sharps container as sharps disposal is very costly. All non-sharp equipment should be placed in the bags provided near the sink of each ward.

If YOU use a sharp YOU are responsible for its disposal

7. LABELLING OF FORMS AND SPECIMENS

All specimens MUST be labelled with the patients' name, UMRN, location and date and time of collection. Specimen labels may be available in patients' notes; at RPH specimen labels are attached to request forms in outpatients by reception staff.

When using pre-printed labels it is essential to check that the information agrees with that on the request form. Mislabelled or unlabelled specimens must be recollected.
Specimens for Transfusion Medicine (Cross Matching and Group and Hold) require any pre-printed label to be initialled by the collector at RPH; this hospital policy aims to ensure that the identification of these samples is absolute.

After labelling the specimens, date and time the request form and sign as the collector. Errors in collection and or labelling can then be traced to the person responsible for the collection.

8. TRANSPORTATION AND STORAGE OF SPECIMENS

A good specimen can be ruined if it is not transported to the laboratory in the correct manner. All specimens should be placed in a Bio-hazard bag and may be carried by hand or transported via the Pneumatic Tube System (PTS.)

Only blood collected by the evacuated system and ‘fully-drawn’ may be transported by the PTS. Blood collected by needle and syringe MUST be transported by hand. All specimens should be delivered to the laboratory within 90 minutes of collection, unless the test condition requires delivery within a shorter time. Delivery after this time may result in inaccurate and unreliable results. Storage of specimens should be discussed with specialised laboratory staff.

9. CLEANING AND MAINTENANCE OF EQUIPMENT

Needles are only used once and then discarded, but other equipment is cleaned and reused.

Standard Precautions require that all equipment contaminated by blood or other body fluids is cleaned and disinfected immediately.

Accidental Spills

Gloves must be worn throughout

1. Confine the spill using paper towels or tissues
2. Clean the area with cold water and anionic detergent (Lime F at RPH)
3. Disinfect with 1% hypochlorite solution
4. Dispose of infectious waste in bins provided

Remove gloves and wash hands

If blood is spilled on bed linen, inform nursing staff and offer to help. Blood spills on uniforms - change immediately and place soiled uniform in linen bag. Please clean/disinfect/sterilise contaminated equipment as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourniquet</td>
<td>Rinse under cold water and wash with anionic detergent, ensure all blood and stain is removed. Soak for 1 minute in 1% hypochlorite solution, rinse in cold water and hang-up to dry.</td>
</tr>
<tr>
<td>Needle holders</td>
<td>Rinse in cold water and place in anionic solution for at least 10 minutes. Rinse and soak in hypochlorite solution for at least 15 minutes. Rinse in cold water and allow to dry.</td>
</tr>
<tr>
<td>Request forms</td>
<td>Rinse in cold water to remove blood, pat dry with paper towels. Place in Biohazard bag; photocopy on return to the laboratory. Stamp and sign copy. Discard original in 'Confidential Bin' or yellow-lined bin.</td>
</tr>
</tbody>
</table>

Any problems concerning Standard Precautions should be addressed to the Phlebotomy Coordinator or the Infection Control Nurses.

HAEMOLYSIS

Haemolysis produces unreliable test results. Haemolysis will be present in varying degrees due to the following practices:

- incorrect venepuncture technique
- tourniquet too tight, too close to site, on for too long
- the use of needles that are too fine
- allowing blood to pass through more than one needle
- incorrect filling of the collection tubes
- insufficient specimen
- shaking of the specimen
- dropping specimen
- sending specimens via the PTS that are not fully drawn
- sending specimens via the PTS that have been collected by needle and syringe

HAND BLEEDS

Hand bleeds should not be attempted unless you are sure that there are no available sites in the arm.

Veins in the hand are much smaller than those in the arm, are much finer and softer to palpate. Hand veins are very movable so careful anchoring is essential.

Patients find hand bleeds more painful and care must be taken to minimise this trauma. Always check the cephalic vein, on the inside of the wrist - if this vein palpates well it should be attempted before a hand bleed.

1) Keep hand and arm in a dependent position
2) Apply tourniquet midway between hand and elbow
3) Gently tap or stroke hand in the direction of blood flow
4) Position the hand so that the fingers are lightly curled
5) Palpate and anchor vein securely
6) Use a scalp vein needle ('butterfly') or needle and syringe
7) Perform the venepuncture with utmost care
8) Release the tourniquet and apply firm pressure immediately needle is removed
9) Raise hand to help minimise bruising
10) Check site and apply dressing ONLY after bleeding has ceased.

**BLOOD CULTURES**

Blood cultures are requested when a patient presents with a fever of unknown origin, usually when the temperature of the patient 'spikes'. Immune-suppressed patients may not present with a temperature.

Because blood cultures identify an infection in the blood stream, it is important that the technique employed is an aseptic technique, ie not contaminated during collection.

There are several types of blood culture collections and it is necessary to ensure the correct bottles are chosen for the test required.

**Method of Collection**

- Identify the patient in the normal manner.
- Ensure that you have a suitably large, clear space for your equipment.
- Collect the following equipment:
  - tourniquet
  - gloves
  - alcohol wipes x 4
  - adhesive tape
  - cotton wool swab
  - evacuated scalp vein set (butterfly) or scalp vein set + adaptor
  - correct blood culture bottles
  - patient ID labels
  - syringe and needle (still packaged)
  - needle holder and tubes for any other blood samples.

1. Wash hands thoroughly and dry. Put on gloves.
2. Remove blood culture bottles from Bio-Hazard bag and remove plastic flip tops without touching the rubber septum of the bottles.
3. Place an alcohol wipe on the top of each bottle - taking care to hold the swabs with a minimum of handling.
4. Choose the most suitable site for venepuncture and apply the tourniquet. Palpate the vein and identify its position carefully.

5. Swab the site in a downward action only using one alcohol swab, repeat the swabbing using a second alcohol swab. **DO NOT TOUCH NOR PALPATE THE VEIN AFTER SWABBING.**

6. Allow the site to air dry.

7. Remove scalp vein from packaging ensuring that neither end of the needle touches any other object (including hands).

8. Insert the scalp vein into the vein and tape lightly in place.

9. Remove swab from 1st culture bottle (anaerobic - orange cap) and insert multi-sampling needle into the centre of the septum while holding the bottle on a firm surface.

   **Blood should flow in a continuous stream until approximately 10mL has been added.**

10. Remove multi-sampling needle from bottle, remove swab from 2nd culture bottle (aerobic - green cap) and insert multi-sampling needle as in step 9.

11. Mix all culture bottles carefully.

12. If other blood collections are requested, connect the needle holder to the scalp vein set and proceed as normal.

13. When collections are completed, release the tourniquet, remove the tape holding the scalp vein and remove the scalp vein from the vein and dispose carefully.

   Blood cultures must be labelled with patients name, UMRN, ward, date and time. Avoid labelling over the bar-code of the culture bottles.

   Return the complete set of bottles in the biohazard bag provided to the laboratory or microbiology ASAP.

   **Blood culture bottles that don't draw sufficiently must be topped-up with needle and syringe ensuring an aseptic technique at all times.**

**REFERENCES**

Phlebotomy services from SCGH, RPH and FH produced this material collaboratively.
STUDENT NAME: ……………………… STUDENT NUMBER: ……………………………
DATE: ………………… TERM: ……… EXAMINER: ……………………………..

FORMATIVE ASSESSMENT FORM FOR VENEPUNCTURE 2011 – SKILL B
Not demonstrated = does not meet any of the criteria documented
Demonstrated = meets all criteria – able to practice with minimal supervision

<table>
<thead>
<tr>
<th>NOT DEMONSTRATED</th>
<th>DEMONSTRATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EXPLANATION AND CONSENT</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>Introduce self. Describe the procedure to the patient, ensures the patient understands the reason for the procedure. Gives opportunity to ask questions. Obtains permission to perform the procedure. Ensures minimal discomfort to patient.</td>
<td></td>
</tr>
</tbody>
</table>

| 2. LANGUAGE AND BEHAVIOUR | 0 1 2 3 4 |
| Uses simple English, easy to understand, no jargon. Language is appropriate, professional. Behaviour is appropriate, including proximity to patient at all times, positions the patient appropriately, ensures comfort and privacy. |

3. TIME TAKEN
Not rushed, but efficient.

4. ASEPSIS

5. COLLECTION OF EQUIPMENT
Takes all required equipment to the bedside and follows test conditions.

6. CHECKS IDENTITY
Identifies the patient by UMRN, full name and date of birth against request form.

7. VENEPUNCTURE
Performs basic venepuncture technique correctly. Minimises patient discomfort.

8. LABELLING and TRANSPORTATION
Labels specimens correctly and transports to laboratory appropriately.

9. DISPOSAL OF EQUIPMENT
Disposes of sharps and blood stained equipment appropriately, cleans area.

10. PATIENT STATUS
Checks venepuncture site and applies dressing once bleeding has stopped.
SKILL C

Urinary Catheterisation

Skill Training Program 2011
Originally developed in association with continence advisors from Fremantle Hospital.

Outcomes
The skills training session will enable the student to:

1. Describe principles of fluid balance management
   a. State reasons for urinary catheterisation

2. Correctly insert urinary catheter for male and female
   b. Explain procedure/obtain consent/maintain privacy
   c. Prepare equipment
      i. select the correct catheter size/type
   d. Maintain asepsis
      i. Don sterile gloves correctly
      ii. Avoid contamination of sterile field
      iii. Take appropriate action if sterile field is contaminated
   e. Insert catheter correctly (male and female)
      i. Avoid inflating catheter balloon whilst still in urethra
      ii. Recognise situations which require expert help
      iii. Recognise allergic reaction to lignocaine gel
      iv. Collect specimen if required
   f. Connect drainage bag
   g. Dispose of equipment correctly
   h. Record patient clinical status - document insertion date and time as well as urinary output.
TUTORIAL INFORMATION

Indications

1. Intermittent:
   - to measure residual volume
   - to introduce contrast media
   - to permit adequate bladder emptying eg. atonic bladder
   - to obtain uncontaminated urine for culture in females
   - for urodynamic assessment

2. Continuous:
   - to relieve acute or chronic urinary retention
   - to accurately measure urine output eg. post operatively
   - in urologic practice:
     - used as stents after surgery eg. urethral or bladder neck incisions
     - post transurethral retrograde prostatectomy [TUR(P)] etc.
   - for long term use eg. where TUR(P) is medically contraindicated

Contraindications

1. Blood at the urethral meatus.

<table>
<thead>
<tr>
<th>Principle #1. Blood at the meatus is a contraindication to urethral catheterisation.</th>
</tr>
</thead>
</table>

2. Urethral disruption.

3. Post-operative urological patients, especially after urethral, prostatic or bladder neck surgery. Never remove the catheter of a patient post radical prostatectomy. If in any doubt check with the Urologist.

<table>
<thead>
<tr>
<th>Principle #2. Don't mess with post operative Urology patients’ catheters.</th>
</tr>
</thead>
</table>

Catheters

1. Lumens:
   - Single lumen (no balloon): in/out catheterisation eg. Nelaton catheter
   - Two-way (double lumen ie. drainage channel + balloon inflation channel)
     eg. Foley catheter): continuous catheterisation
   - Three-way (triple lumen ie. irrigation channel + drainage channel +
     balloon inflation channel): when blood, clot or debris has to be washed out
     of the bladder. Common in post-operative Urology patients.

2. Size:
   - French gauge:
     - $1F = 0.33mm \varnothing$ ie. each mm in $\varnothing$ is $\approx 3F$
     - $1F = 1$ Charrière (Charr.)
- Catheter size refers to the outside circumference of the catheter, not the luminal diameter therefore a two-way catheter has a larger bore drainage channel than a three-way catheter for any given French size
- Common sizes for routine catheterisation of adults is 14F to 16F
- Commonest size in post-operative Urology patients is a 22F three-way catheter. Use this size for bladder washouts where blood and clots need to be flushed out.

3. Materials
   - Silicone elastomer coated latex: can be left in situ for up to 2 weeks – NOT usually found in the wards now.
   - All silicone: can be left in situ for up to three months at a time
   - Lubricious (hydrogel) coated: creates a hyrophilic "cushion" between the catheter surface and the urethra helping to reduce irritation of the mucosa and minimise encrustation. Can be left in situ for up to three months at a time. Most common catheter in the hospital setting.
   - Silver coated: antibacterial properties. Useful in patients with recurrent symptomatic infections.
   - Others: plastic, polyurethane etc.: generally used for in/out catheterisation

4. Special types
   - Coudé, Malecot etc.: different shapes for specific purposes such as negotiating the bulb of the urethra

Principle #3. Which catheter you put in depends on what you want to get out.

URINARY CATHERISATION – FEMALE
PROCEDURE

Alert:
- If unable to visualise urethral meatus then contact experienced nursing staff (ie Senior Registered Nurse (SRN), Clinical Nurses (CN) or Continence Advisor for advice before attempting catheterisation.
- Attach catheter to the upper thigh allowing a gentle curve from the external urethral meatus to the skin to prevent tension on catheter.
- Ensure patient has increased oral or parenteral fluids whilst catheter in situ.
REQUIREMENTS

Trolley
- Catheter pack
- Brown paper bag

Bottom Shelf
- Sterile gloves
- Appropriate sized catheter x 2
- Catheter preparation solution x 1
- Syringe of lignocaine gel 2% with chlorhexidine gel 0.05% x 1
- 10ml syringe
- Sterile water to inflate catheter balloon - check catheter for required amount
- Sterile drainage bag and holder for bedside
- Securing device to attach catheter to leg
- Specimen jar if needed

Other
- Adequate lighting – examination light

PROCEDURE

1. Explain procedure to patient and provide support throughout. Ensure privacy. Position patient comfortably.

2. Perform antiseptic handwash and don sterile gloves.

3. Prepare equipment and solutions:
   - Draw up sterile water for balloon inflation.


5. Use gloved hand to separate labia, maintain this position until urine flows.


7. Instil 5ml of lignocaine gel 2% with chlorhexidine gel 0.05% into the urethra.

8. Place catheter in kidney dish and place between patient's thighs.

9. Use forceps to gently introduce catheter into urethral meatus until urine flows.

10. Inflate balloon, as per manufacturer’s instructions, usually 10mL.
11. Connect bag to catheter aseptically, do not break connection until catheter is removed or bag changed.

12. Attach catheter to patient's upper thigh (Figure 1), allowing a gentle curve from the external urethral meatus to the skin (ie, without tension) using securing device.

![Figure 1 – Securing urethral catheters](image)

13. Measure and record urine drainage – measured approximately 10 minutes after catheter inserted.

14. Document date, time catheter inserted, catheter size and urine volume in:
   - patient's medical record
   - patient's nursing care plan
   - fluid balance chart.

15. Dispose of equipment.

16. If patient ready for discharge educate in the care of the catheter and provide Fremantle Hospital and Health Service, “Urinary Catheter Care”, Booklet.

REFERENCE


URINARY CATHETERISATION – MALE

PROCEDURE

NURSING ALERT:
- *Do not insert catheter into patients with pelvic trauma or blood at urethral meatus, contact Urology Registrar.*
- *If patient has had a recent Urology procedure and the Indwelling Catheter (IDC) blocks, then Urology Registrar must be called.*
- *Contact Continence Adviser or Medical Officer (MO) if male urinary catheterization is not successful after one attempt.*
- *Attach catheter to the upper thigh allowing a gentle curve from the external urethra meatus to the skin to prevent tension on catheter.*
- *Ensure patient receives oral or parenteral fluids whilst catheter in situ unless contraindicated.*

REQUIREMENTS

**Trolley**
- Catheter Pack
- Brown paper bag

**Bottom Shelf**
- Sterile gloves
- Appropriate sized catheter x 2
- Catheter preparation solution x 1
- Syringe of lignocaine gel 2% with chlorhexidine gel 0.05% x 1
- 10mL syringe
- Sterile water to inflate catheter balloon - check catheter for required amount
- Sterile drainage bag and holder for bedside
- Securing device to attach catheter to leg
- Specimen jar if needed

**Other**
- Adequate lighting

PROCEDURE

1. Explain procedure to patient and provide support throughout. Ensure privacy. Position patient comfortably.
2. Perform antiseptic handwash, don sterile gloves.
3. Prepare equipment and solutions:
   • draw up sterile water for balloon inflation.


5. Place sterile dish between patient's thighs.

6. Hold the penis using second hand towel, retract foreskin to expose glans if patient uncircumcised.

7. Swab the glans and external meatus with single downward strokes.

8. Hold penis vertical (so that urethra is straightened) and extended to its full length. Using syringe, instil lignocaine with chlorhexidine lubricant gel into the urethra. Gently squeeze the end of the penis to occlude the urethra so that lubricant gel is retained.

9. Whilst holding penis wait for 1-3 minutes to allow anaesthetic gel to work.

   Holding the penis at the same angle and length (as before), gently insert the catheter directly into the urethral meatus. Advance catheter to hilt and wait for urine to flow – urine must flow before balloon is inflated. Catheter should easily advance along urethra. If unable to insert catheter, contact Continence Adviser or MO.

   Inflate balloon, as per manufacturer’s instructions, usually 10ml. **Stop** if this causes pain (regardless of whether urine draining) and contact Continence Adviser or MO.

10. Reposition foreskin if patient uncircumcised.

11. Connect bag to catheter aseptically, do not break connection until catheter is removed or bag is changed.


13. Attach catheter to patient’s upper thigh with appropriate device allowing a gentle curve from the external urethral meatus to the skin (without tension).

---

**Figure 1 – Securing urethral catheters**

---

60
14. Measure and record urine drainage – measure again approximately 30 minutes after catheter inserted.

15. Document date, time catheter inserted, catheter size and urinary volume drained, in:
   - patient’s medical record
   - patient’s nursing care plan (invasive devices)
   - fluid balance chart.

16. Discard equipment, remove gloves and perform hand hygiene.

17. If patient ready for discharge educate patient in the care of the catheter and provide Fremantle Hospital and Health Service, “Urinary Catheter Care” booklet.

**REFERENCE**


**FORMATIVE ASSESSMENT FOR URINARY CATHETERISATION 2011 – SKILL C**

Not demonstrated = does not meet any of the criteria documented  
Demonstrated = meets all criteria – able to practice with minimal supervision

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Not Demonstrated</th>
<th>Demonstrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce self. Describe the procedure to the patient, ensure the patient understands the reason for the procedure. Give opportunity to ask questions. Obtain permission to perform the procedure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe what you are about to do and what you are doing during the procedure. Ensure minimal discomfort to patient. Able to verbalise rationale for the procedure and complications for the procedure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use simple English, easy to understand, no jargon. Language which is appropriate, ‘politically correct’, professional. Behaviour which is appropriate, including proximity to patient at all time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not rushed, but efficient.</td>
<td></td>
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</tr>
<tr>
<td>Assemble all necessary equipment. Discuss choice of catheter size and type. Select appropriate size.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wash hands, Don sterile gloves correctly. Avoid contamination of sterile field. Take appropriate action if sterile field is contaminated. Wash down correctly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swab down meatus. Apply anaesthetic gel to urethral meatus. Use forceps to introduce catheter until urine flows. Empty bladder. Connect drainage bag.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensure patient left comfortably. Evaluate clinical status of patient and record patient data accurately.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispose of equipment appropriately. Measure and record urine and document date and time catheter inserted.</td>
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</tbody>
</table>
SKILL D

Resuscitation

Skill Training Program 2011

Learning Outcomes
By the end of Level 4 the student will:

Overall
Be able to clinically assess airway, breathing and circulation; recognise cardiac arrest; demonstrate the basic life support algorithms; and demonstrate use of the oropharyngeal (Guedel) airway, bag-mask-ventilation and shock advisory defibrillation.

Knowledge
- Knowledge of the basic and advanced life support algorithms
- Knowledge of causes of cardiac arrest, pre-arrest conditions, role of the first responder and role of the hospital cardiac arrest/medical emergency teams
- Describe the differences between adult, child and neonatal CPR

Life Support Skills
- Recognition of danger, use of universal precautions and self-protection
- Assess responsiveness of the collapsed patient and recognise the clinical features of cardiac arrest
- Demonstrate the correct procedure for calling for assistance in both out of hospital and in hospital circumstances
- Recognise clinical features of airway obstruction
- Achieve an open airway using positioning techniques (head tilt, chin lift, jaw thrust, lateral positioning), and/or insertion of a Guedel airway
- Assess adequacy of breathing using clinical features of work and effectiveness of breathing
- Apply oxygen therapy
- Perform mouth to mouth breathing, mouth to mask breathing, bag-valve-mask ventilation to achieve adequate ventilation
- Assess adequacy of circulation using clinical features of pulse, perfusion, colour, level of consciousness
- Demonstrate 1 and 2 person external cardiac compression with appropriate rate, depth, position
- Apply and appropriately use shock advisory defibrillation
- Initiate and maintain all of the above skills in an appropriate sequence and for appropriate indications
TUTORIAL INFORMATION
Originally developed by CTEC

Resuscitation Skills

- The Rationale for Early Defibrillation
- Basic Life Support Flow Chart
- Summary of differences in Cardiopulmonary Resuscitation between Adults, Children and Infants
- Adult Advanced Life Support Flow Chart
- Algorithm for a two person response to a collapsed victim – use of a shock advisory (semiautomatic) external defibrillatory (SAED)
- Defibrillation
- Management of a Choking Victim Algorithm

Further Information

Recommended reading:
Australian Resuscitation Council Guidelines and Policy Statements

http://www.resus.org.au/

Disclaimer
The information contained in this booklet is for guidance only and cannot replace clinical judgement. No responsibility is taken by the Centre for Anaesthesia Skills & Medical Simulation, nor the authors of individual guidelines nor the Societies and Associations mentioned herein.
THE RATIONALE FOR EARLY DEFIBRILLATION

The chain of survival symbolizes the best approach to the treatment of sudden cardiac arrest. It displays the four events that must occur quickly in order to optimise a person’s chance of surviving a cardiac arrest. Early defibrillation is a major link in the chain.

There are four links in the chain of survival: Early Recognition, Early CPR, Early Defibrillation, Early ACLS (advanced cardiac life support).

- Ventricular Fibrillation (VF) is a common initial dysrhythmia of cardiac arrest.
- Defibrillation is the only effective treatment for VF and Pulseless VT.

To have the best chance of success, defibrillation must be provided early.

Potential rescuers at all levels must recognise not only the signs of collapse but also the warning signs of impending collapse. Utilisation of Medical Emergency Team Activation Criteria in a hospital environment or greater awareness in the prehospital environment in response to chest pain, shortness of breath and other signs of MI is an important component.
## CARDIOPULMONARY RESUSCITATION

**Adults, Children and Infants**

<table>
<thead>
<tr>
<th>AIRWAY</th>
<th>BACKWARD HEAD TILT, CHIN LIFT AND JAW SUPPORT</th>
<th>BACKWARD HEAD TILT, CHIN LIFT AND JAW SUPPORT</th>
<th>NEUTRAL HEAD POSITION AND JAW SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREATHING</td>
<td>CHECK FOR NORMAL BREATHING, IF NOT BREATHING NORMALLY COMMENCE CHEST COMPRESSIONS</td>
<td>CHECK FOR NORMAL BREATHING, IF NOT BREATHING NORMALLY COMMENCE CHEST COMPRESSIONS</td>
<td>CHECK FOR NORMAL BREATHING, IF NOT BREATHING NORMALLY COMMENCE CHEST COMPRESSIONS</td>
</tr>
<tr>
<td>CIRCULATION HAND POSITION</td>
<td>LOWER HALF STERNUM 2 HANDS</td>
<td>LOWER HALF STERNUM HEEL OF HAND OR 2 HANDS</td>
<td>LOWER HALF STERNUM 2 FINGERS OR 2 THUMB TECHNIQUE</td>
</tr>
<tr>
<td>DEPTH OF COMPRESSION</td>
<td>1/3 DEPTH OF CHEST</td>
<td>1/3 DEPTH OF CHEST</td>
<td>1/3 DEPTH OF CHEST</td>
</tr>
<tr>
<td>BASIC LIFE SUPPORT RESCUE</td>
<td>RATIO: 30 COMPRESSIONS / 2 BREATHS 5 CYCLES / 2 MINUTES</td>
<td>RATIO: 30 COMPRESSIONS / 2 BREATHS 5 CYCLES / 2 MINUTES</td>
<td>RATIO: 30 COMPRESSIONS / 2 BREATHS 5 CYCLES / 2 MINUTES</td>
</tr>
<tr>
<td>ADVANCED LIFE SUPPORT RESCUE TWO HEALTHCARE RESCUERS</td>
<td>RATIO: 30 COMPRESSIONS / 2 BREATHS 5 CYCLES / 2 MINUTES</td>
<td>RATIO: 15 COMPRESSIONS / 2 BREATHS 4 CYCLES / MINUTE</td>
<td>RATIO: 15 COMPRESSIONS / 2 BREATHS 4 CYCLES / MINUTE</td>
</tr>
</tbody>
</table>

Summary of ARC Policy Statements (Reviewed January 2011)
Basic Life Support

D: Dangers?
R: Responsive?
S: Send for help
A: Open Airway
B: Normal Breathing?
C: Start CPR
   30 compressions: 2 breaths
   if unwilling/unable to perform rescue breaths, continue chest compressions
D: Attach Defibrillator (AED)
   as soon as available and follow its prompts

Continue CPR until responsiveness or normal breathing return
Advanced Life Support for Adults

Start CPR
30 compressions : 2 breaths
Minimise Interruptions

Attach Defibrillator / Monitor

Assess Rhythm
Shockable
Shock
CPR for 2 minutes

Non Shockable
CPR for 2 minutes

Return of Spontaneous Circulation ?

Post Resuscitation Care

During CPR
Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions (e.g. charge manual defibrillator)

Drugs
Shockable
* Adrenaline 1 mg after 2nd shock
  (then every 2nd cycle)
* Amiodarone 300 mg after 3rd shock
Non Shockable
* Adrenaline 1 mg immediately
  (then every 2nd cycle)

Consider and Correct
Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care
Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Re-evaluate oxygenation and ventilation
Temperature control (cool)
TWO PERSON RESPONSE TO A COLLAPSED VICTIM
Use of a Shock Advisory (Semiautomatic) External Defibrillator (SAED)

COLLAPSE

Person 1
Access Emergency Response System
Perform CPR until Defibrillator available

Person 2
Access Defibrillator
Attach Electrodes/Pads to Victim’s Chest
Attach Leads to SAED
Respond to Audible or Visual Prompts or Warnings from SAED

Advice to Shock
“STAND CLEAR”
Press Button To Shock
Shock Once As Advised

No Shock Advised
CHECK FOR SIGNS OF LIFE
No signs of Life
CPR 2 Minutes
Follow BLS Algorithm

Check For Signs of Life
DEFIBRILLATION

Why/how it works
- Stops electrical activity in cardiac muscle cells giving a chance for normal conduction to restart.

Current recommendations
- Defibrillate in Pulseless VT, VF.

Types of defibrillator
- Manual – requires operator understanding - hospital
- Shock Advisory – anyone can work – community, ambulances (also called AED – Automated External Defibrillator)
- Semi automatic – combination of the above – hospital.

Prepare the patient/area
- Chest must be dry
- Do not stand in a puddle!
- Ensure no metal objects or GTN patches are underneath fast patches/paddles
- If patient has an internal pacemaker, ensure fast patch is at least 5cm away from it
- Move oxygen away from patient (risk of explosion).

Attach fast patches or gel pads
- Right 2nd intercostal space, mid-clavicular line
- Left 5th-6th intercostal space, mid-axillary line

Manual defibrillation with fast patches
- Get ECG trace (Turn defibrillator on!)
- Identify rhythm
- Select energy level (200 J for monophasic, see hospital or manufacturer’s guidelines for biphasic)
- Charge
- Yell “All clear” (and check that everyone is clear)
- Quickly check that patient is still in shockable rhythm
- Shock.

Manual defibrillation with paddles
- Get ECG trace (attach ECG leads, select “lead II”)
- Identify rhythm
- Put gel pads on patient’s chest
- Select energy level
- Put paddles on patients chest
- Charge using charge button on right hand (apex) paddle
- Yell “All clear” (and check that everyone is clear)
- Quickly check that patient is still in shockable rhythm
- Shock
- Do not lift the paddles from the patient’s chest between the three shocks.
Shock advisory defibrillation

- Follow prompts (voice or on screen) Stand clear during analysis (i.e. stop CPR)
- Most modern shock advisory defibrillators will only shock in VF (the machines cannot tell if the patient has a pulse). Clinically, a patient in pulseless VT will rapidly deteriorate into VF which can then be shocked. Conversely, if a patient in VT with a pulse is shocked, they may go into asystole reducing their chances of reverting to sinus rhythm.

Changing from Shock-Advisory to manual mode

- Depends on the defibrillator
- Some need the dial turning from shock advisory to manual; others automatically turn to manual mode if you interrupt the shock advisory mode by pressing one of the buttons (e.g. charge or select energy).

Monophasic v Biphasic

- **Monophasic** – current is delivered in one direction only. Research has shown that most effective energy levels are 200J, 200J then 360J for the first three shocks and 360J for all subsequent shocks.

- **Biphasic** - most modern defibrillators are biphasic. Current is delivered in two directions. Theoretically less energy is required but there is little research identifying the most effective energy level to use. Energy levels of 150J for initial and subsequent shocks have been shown to have at least equivalent success rates in terminating VF compared with monophasic shocks.

- Check the individual hospital policy or manufacturer’s guidelines for appropriate energy levels.

---

*All defibrillators are slightly different. Each time you go to a new area/hospital familiarize yourself with the defibrillator and equipment available*
MANAGEMENT OF FOREIGN BODY AIRWAY OBSTRUCTION (CHOKING)

Assess Severity

Ineffective Cough

Severe airway obstruction

Unconscious
Call ambulance
Commence CPR

Conscious
Call ambulance
Give up to 5 back blows
If not effective
Give up to 5 chest thrusts

Effective Cough

Mild airway obstruction

Encourage coughing
Continue to check casualty until recovery or deterioration
Call ambulance

December 2010
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognizes Danger and uses self-protection equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assesses responsiveness of collapsed patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calls for assistance using correct procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognises airway obstruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achieves open airway through correct positioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inserts Guedel Airway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assesses breathing- adequacy and effectiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applies oxygen therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correctly performs mouth to mouth and bag-mask ventilation -achieves good air entry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assesses adequacy of circulation - pulse perfusion, colour, consciousness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates correct 1 person external cardiac compression - rate, depth, position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates correct 2 person external cardiac compression - rate, depth, position.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correctly applies and uses shock advisory defibrillation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follows correct sequence for the above.</td>
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</tbody>
</table>

Feedback

____________________________________________________________________

____________________________________________________________________
Skill E

Patient Handling

Skill Training Program 2011
Based on work from The Education and Development Centre - SCGH

Outcomes

By the end of Level 4 the student will:

1. Demonstrate awareness of the risk management approach to manual handling and apply strategies to assess and modify the environment and use equipment where applicable, to improve the safety of patient handling.

2. Demonstrate the use of safe postures and actions while performing common patient handling tasks. For example, rolling patients, spinal log roll, supine to sit transfer, sitting to standing, walking with patients.

   a. Assess patient's current mobility
   b. Assess the need for assistance
   c. Assess the equipment needs
   d. Prepare the physical area
   e. Adjust bed height if required
   f. Explain the task to patient
   g. Instruct the patient and/or assistant
   h. Adopt correct stance
   i. Use self protective postures and actions
   j. Prepare patient position
   k. Promote patient assistance where possible

3. Demonstrate ability to assist and "hold" limbs.

   a. Determine access requirement
   b. Know personal limitations- get assistance if required
   c. Use standing platform if needed
   d. Choose hand holds
   e. Wear gloves if exposure to body fluids is possible
   f. Position self to maximise access and safety
   g. Use self protective postures and actions
   h. Make minor adjustments of position as required
   i. If tired, inform staff and rest
   j. If standing platform used- remove after holding complete.
## Patient Handling Competency Evaluation 2011 – Skill E

**Course:** Patient Handling: 4\textsuperscript{th} Year Medical Students

<table>
<thead>
<tr>
<th>Assessors Name/s:</th>
<th>Venue:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Session length:</th>
<th>Date:</th>
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<tr>
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</tbody>
</table>

**Database Entry if applicable**

4\textsuperscript{th} Medical Students / UWA Medical School

### Overall Performance Criteria (C / NYC)

#### Criteria 1: SAFER Patient Handling Risk Management

1. Planning: Environment and equipment
2. Risk Assessment: Patient assessment and care

#### Criteria 2: SAFER Patient Handling transfers

- Demonstrates moving patients safely in bed (Patient not / able to assist)
  1. Pushed Roll
  2. Pulled Roll
  3. Roll Assist by 2

- Demonstrates assisting with team transfers
  1. Spinal Logroll
  2. Trolley to bed transfer with slide board and slide sheet
  3. Limb holding in the theatre environment

- Demonstrates moving patients safely in / out of a chair
  1. Assisting patient forward in chair in sitting
  2. Sitting to standing assist from the side
  3. Standing to sitting assist from the side
  4. Assisted walking
  5. Dealing with falls

- Demonstrates evacuating NWB patients in an emergency (Patient not able to assist)
  1. Evacuation with Rescue Sheet

#### Criteria 3: Self-protective behaviour

Candidate uses self-protective gestures and actions during patient handling transfers
Performance Criteria:

To be deemed competent, all 3 criteria (see shaded boxes) must have a tick (✓).

An (x) placed in the column means that not enough evidence for competency was demonstrated.

Comments can be made under “Follow up for NYC staff” as applicable, using the boxes below.

1: SAFER patient handling risk management

1.1 Planning: Environment and equipment. The candidate:
- Identifies potential hazards
- Prepares and clears the work area
- Selects and uses appropriate equipment
- Adjusts bed / trolley to an optimal height
- Uses personal protective equipment (if required)
- Is aware of organising workload with adequate breaks and regular change of position

1.2: Risk Assessment: Patient assessment and care. The candidate:
- Observes the care plan / mobility chart
- Selects the appropriate minimal lift transfer
- Communicates with and instructs the patient
- Requests the patient’s assistance
- Prepares the patient’s position

2: SAFER patient handling transfers: demonstrated during the transfer. The candidate:
- Communicates with the team (if applicable)
- Positions feet (wide stable base) and uses legs
- Maintains spinal alignment
- Maximises patient participation
- Moves the patient through normal movement
- Conducts transfer at appropriate speed

3: Self-protective postures and actions. The candidate demonstrates applicable postures and actions (please circle)

<table>
<thead>
<tr>
<th>Bench</th>
<th>Bracket</th>
<th>Counterbalance</th>
<th>Side Lunge</th>
<th>Forward / Backward Lunge</th>
<th>Weightlifters</th>
<th>Pivot</th>
<th>Kneels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saddle Seat</td>
<td>Bow</td>
<td>Windscreen Wipers</td>
<td>Oblique Lunge</td>
<td>Waddie</td>
<td>Wings</td>
<td>Envelop</td>
<td>Cross brace</td>
</tr>
<tr>
<td>Spoon</td>
<td>Bar</td>
<td>Handrail Hold</td>
<td>Walking Stick Hold</td>
<td>Strap Hold</td>
<td>Clothes Hold</td>
<td>Drop</td>
<td></td>
</tr>
</tbody>
</table>

General Session Notes:

Follow Up for NYC staff:

<table>
<thead>
<tr>
<th>NAME</th>
<th>Word / Dept</th>
<th>FOLLOW UP (When, how, who)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Assessors Signature: EdCent
3.1 NURSING ATTACHMENT

Students are required to spend 2 half-days in a nursing attachment during the Course.

Learning Outcomes of the nursing attachment include:

- Discuss and explain the role of the nurse as Health Professional
- Demonstrate ability to
  - Perform and record TPR, BP, urinalysis
  - Faeces test x blood
  - Collect sputum
  - Observe and report condition of an IV site
  - Instruct patient how to perform a MSU
- Demonstrate communication skills with staff and patients
- Describe and demonstrate ability to assist patients with personal hygiene.
- Assist patients to mobilise using safe manual handling principles
- Describe process of medication round- explaining procedures involved in checking medications correctly.
- Perform a simple dressing using aseptic technique
- Describe or demonstrate ability to insert a naso-gastric tube
- Demonstrate ability to safely and correctly give intramuscular and subcutaneous injections.
- Discuss the role of pharmacist, occupational therapist, physiotherapist, social worker, and speech therapist in the ward environment.

Learning experiences will include:

- Participation in handover, drug rounds, administration of tablets and injections, intravenous therapy, dressings and the insertion of naso-gastric tubes.
- Learnt to communicate with patients and staff.
- Participation in patient hygiene: showering, sponging, etc.
- Involvement in the preparation of patients for investigations and therapeutic procedures.
- Observation of patients’ emotional reactions to illness, hospitalization and medical staff.
- Understand the role of the nurse in the care of the patient

Assessment

The “Nursing Attachment Sheet” is to be signed off by nursing staff as each procedure is observed or practised.

To make the most of this valuable component of the Core Clinical Methods Course, many of the sessions begin at the “business end” of the day for nurses, i.e. 7.00am. Students must attend every allocated session and must not be late.

All students must complete the following “Nursing Attachment” sheets which will be sighted by the Course Co-ordinator at the completion of the 4 week Introductory Course.
<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Practised</th>
<th>Demonstrator’s Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication</td>
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<td></td>
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<td></td>
<td>- patient</td>
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<tr>
<td>2</td>
<td>Observations/Recording</td>
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<td>- TPR</td>
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<td>- BP</td>
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<td></td>
<td>- urinanalysis</td>
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<td></td>
<td>- faeces test x blood</td>
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<td></td>
<td>- sputum</td>
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<td></td>
<td>- IV site</td>
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<td></td>
<td>- obtaining an MSU</td>
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<td>3</td>
<td>Patient Hygiene</td>
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<td></td>
<td>- showering</td>
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<td></td>
<td>- sponging</td>
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<td>- use of commode</td>
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<td>- use of urinal</td>
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<td>- use of bedpans</td>
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<td>- use of uridome</td>
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<td>- mouth care</td>
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<td>4</td>
<td>Mobilizing Patients</td>
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<tr>
<td></td>
<td>- bed to chair</td>
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<td>- walking with assistance</td>
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<td>- walking with aids</td>
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<td>- transferring bed to trolley</td>
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<td>- feeding patient</td>
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<tr>
<td>5.</td>
<td><strong>Medication Round</strong></td>
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<tr>
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<td>- oral drug administration</td>
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<td></td>
<td>- IV fluid therapy</td>
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<td></td>
<td>- IV medication</td>
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<td></td>
<td>- nasogastric</td>
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<td></td>
<td>- nebuliser</td>
</tr>
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<td></td>
<td>- transdermal/suppositories</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Dressing (simple)</strong></td>
</tr>
<tr>
<td>7.</td>
<td><strong>Oxygen Therapy</strong></td>
</tr>
<tr>
<td>8.</td>
<td><strong>Insertion of Nasogastric Tube</strong></td>
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<tr>
<td>9.</td>
<td><strong>Injection Training</strong></td>
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<tr>
<td></td>
<td>- subcutaneous</td>
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<td></td>
<td>- intramuscular</td>
</tr>
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<td>10</td>
<td><strong>Paramedical Demonstrations</strong></td>
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<tr>
<td></td>
<td>- pharmacist</td>
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<td></td>
<td>- occupational therapist</td>
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<td></td>
<td>- physiotherapist</td>
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<td></td>
<td>- social worker</td>
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<td>- speech therapist</td>
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</tbody>
</table>
Medical Documentation Workshop 2011

Outcomes
By the end of the documentation session in the 4th year Core Clinical Methods skills week the student will be able to:

1. Demonstrate in the written record an integrated approach to the whole person:
   - Utilizing a patient centred clinical method
   - Gives primacy to the patient and the total experience of illness

2. Discuss standard themes/headings utilized in clinical records:
   - Conventional case presentation (i.e. Presenting complaint; History of presenting complaint; Past medical history; Medications; Allergies; Family history; Social history; Systemic enquiry; Physical examination; Laboratory tests and investigations; Problem list; Assessment; Plan)
   - Patient centred case presentation (i.e. Patient’s chief concern or request; Patient’s illness experience, including quotes, feelings, expectations, impact on function, meaning to patient; Disease, including history of present illness, past medical history, review of systems, physical examination, laboratory tests etc; Person, including patient profile; Context, including family history, genogram; Patient-doctor relationship, including issues of transference/countertransference, finding common ground; Assessment with problem list; General discussion; Proposed management plan)
   - SOAP (i.e. Subjective/Symptoms; Objective/On examination; Assessment; Plan)
   - Problem Orientated Medical Record

3. Use the written record to present the findings from interview and examination:
   - In a clear, logical manner
   - With integration of the subjective and objective aspects of the interaction
   - To build a clear picture of the person, illness, diseases and underlying pathology

4. Verbalise the legal and quality aspects of the written case record:
   - Legibility
   - Date
   - Signature, name, contact number and role

5. Discuss the uses of the written case record and ongoing notes:
   - Legal record
   - Team communication
   - Focus for management plan – both current and future
   - Utilization for clinical or epidemiological research
CONVENTIONAL CASE PRESENTATION

- Name and age
- Presenting complaint
- History of presenting complaint
- Past medical history
- Medications
- Allergies
- Family history
- Social history (including alcohol and cigarette consumption)
- Systemic enquiry
- Physical examination
- Laboratory tests and investigations
- Problem list
- Assessment
- Plan

PATIENT CENTRED CASE PRESENTATION

From: “Patient-centred Medicine. Transforming the Clinical Method” Stewart Metal 1995

- Patient’s chief concern or request
- Patient’s illness experience, including quotes, feelings, expectations, impact on function, meaning to patient
- Disease, including history of present illness, past medical history, review of systems, physical examination, laboratory tests etc
- Person, including patient profile
- Context, including family history, genogram
- Patient-doctor relationship, including issues of transference/counter transference, finding common ground
- Assessment with problem list
- General discussion
- Proposed management plan

SOAP

- Subjective/Symptoms
- Objective/On examination
- Assessment
- Plans
  - For diagnosis (Dx)
  - For Monitoring-type information (Mx)
  - For Treatment (Rx)
  - For the education of the patient (Ex)
Summarising the history, physical examination and formulating the patient's problem(s) and developing a problem list is the next key step in the clinical process.

It requires you to accurately put all the positive and important negative findings together and reason through the likely diagnosis.

This will be recorded either in the patient record in a written form, or transmitted to colleagues verbally. Succinct presentations of a patient's history, findings on physical examination, of a patient's problems are used daily in clinical care. Skills like this need to be practised and we suggest you present on all patients you see, whether to a fellow student, intern, registrar or consultant.

Medical Records

Medical Records are important for recording information, for pulling together information from various places, and for communicating with colleagues. Good records are essential for good patient management. They save time and duplication if done well. They are a legal document.

Basic Framework for a Problem Orientated Medical Record

Date and time, who you are
Patients name, DOB or age (ensure sticker is on the page)

PC
HPC
PMH
Family history (FH)
Medications (Med)
Allergies
Alcohol/Smoking
Social and occupational history
Systemic Enquiry (SE)
Physical examination
Summary (short paragraph)
Formulation and problem list

Sign and print your name and position, contact number (pager).
Formulation

This is the key point where you put together the evidence from the history, physical examination and come to a sensible conclusion, both in terms of the “problems” and the likely causes for each, the “differential diagnosis”.

It is useful to start with a brief summary of important positive and negative findings, and then the formulation. You should be able to justify your formulation based on the evidence from the history and examination.

The skills in formulation you will develop over the next three years but you should start making an attempt now, even if you think your knowledge is too limited

- Consider how problems are linked

  eg NOT 1 Acute myocardial infarction
  2 Heart failure

  BUT 1 AMI
  1.1 Heart Failure

  OR NOT 1 Diabetes
  2 Peripheral neuropathy
  3 Blindness

  BUT 1 Diabetes
  1.1 Peripheral neuropathy
  1.2 Retinopathy – blindness

In considering the differential diagnosis, consider Murtagh’s model as a way of thinking about possible diagnoses

- Common (what is the probability diagnosis)
- Severe and life threatening and you shouldn’t miss
- Common Pitfalls (things that are missed)
- Masquerades (diabetes, thyroid disease, anaemia, UTI, depression).
- Is the patient trying to tell me something else

Follow up notes

Follow up notes should usefully be problem orientated, ie each problem is addressed as regards the patient, investigations and plans. A problem orientated record is usefully organised around SOAP

Date and time

Symptoms
On Examination
Assessment (around each problem)
Plan

Sign and print your name and position, contact details
References

- “Patient-centered medicine: Transforming the clinical method” by Moira Stewart, Judith Belle Brown et al. Sage Publications. 1995
- “Clinical Methods – Overview” from Year 4 clinical skills guidebook
- “Medical records” Edited by Bernard Benjamin. 1980
Clinical Immunology Session

Objectives

Conditions affecting the immune system are varied, including allergy, autoimmunity and primary and secondary immunodeficiency.

The Clinical Immunology Laboratory provides a range of investigations designed to assess the functioning of the immune system and to confirm or exclude a diagnosis of a suspected immune-related condition.

The aims of this session are:

1. To make you aware of some of the tests that are available in the Immunology Laboratory
2. To give you an idea of how these tests are preformed
3. To give you an idea of how the results are interpreted
Clinical Immunology Session – Case and Questions

Miss Ann Tucker is being investigated for the cause of joint pains. It is thought that an immune-mediated condition may be the cause and blood tests are arranged. Her serum is tested for the presence of anti-nuclear antibodies (ANA).

1. What is an antinuclear antibody?

2. How is the ANA detected?
   a)
   b)

   Depending on the nuclear component that the ANA is directed against, different patterns of immunofluorescence may be seen on screening.

3. What are the 4 most common patterns seen by immunofluorescence?
   a)
   b)
   c)
   d)

4. What is the ELISA test and what additional information does it provide?
Transfusion Medicine Session

You were asked to label a sample and complete a request form for a patient, Mr Andre Theodosiou, UMRN A223331, DOB 12 January 1969, in the Emergency Department. He was admitted following a major GI haemorrhage, and the consultant has asked you to order the FBP, coagulation tests and 2 units of red cells for an urgent transfusion.

The results are now available:

Full Blood Picture

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>46 g/L</td>
<td>(135 – 180)</td>
</tr>
<tr>
<td>RCC</td>
<td>3.2 x10^{12}/L</td>
<td>(4.50 - 5.50)</td>
</tr>
<tr>
<td>MCV</td>
<td>85 fL</td>
<td>(80 – 100)</td>
</tr>
<tr>
<td>WCC</td>
<td>8.6 x10^{9}/L</td>
<td>(4.0 – 11.0)</td>
</tr>
<tr>
<td>Platelets</td>
<td>180 x10^{9}/L</td>
<td>(150 – 400)</td>
</tr>
</tbody>
</table>

Coagulation Results:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>INR</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>APTT</td>
<td>29.7 secs</td>
<td>(24.6 – 37.0)</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>2.7 g/L</td>
<td>(2.0 – 4.0)</td>
</tr>
</tbody>
</table>

What are the requirements for labelling of a specimen and request form for transfusion?

Sample:

Form:

In an ideal situation where time permits, the laboratory will test for the patient’s blood group and “cross-match” the donor red cell units.

How long does this take?

If there is an urgent requirement for red cells, what can the laboratory do to provide blood more quickly?

What other blood products are available through the TMU?
Clinical Biochemistry Session

Mr Andre Theodosiou, UMRN A223331, DOB 12 January 1969, presents to Emergency Department with major GI haemorrhage. He requires resuscitation and urgent blood tests: FBP, U&Es, LFTs, Coags and cross-match 2 units red cells

1. Sample requirement and “colour of tubes”. Order of draw.

2. Interpretation of results. (Result invalidated by the lab).

<table>
<thead>
<tr>
<th>Plasma</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>141</td>
<td>mmol/L</td>
<td>(134-146)</td>
</tr>
<tr>
<td>Potassium</td>
<td>*** (11.2)</td>
<td>mmol/L</td>
<td>(3.4-5.0)</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>18</td>
<td>mmol/L</td>
<td>(22-32)</td>
</tr>
<tr>
<td>Urea</td>
<td>15.4</td>
<td>mmol/L</td>
<td>(3.0-8.0)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>102</td>
<td>umol/L</td>
<td>(60-110)</td>
</tr>
</tbody>
</table>

3. Analysis and validation of results.

4. Role of Chemical Pathologists and Clinical Biochemists.