

Te Whatu Ora

Health New Zealand

Te Pae Hauora o Ruahine o Tararua
MidCentral



Intensive Care Unit (ICU)

Wāhanga Whāomoomo

Student Nurse Orientation

Nēhi ākonga

Document Control

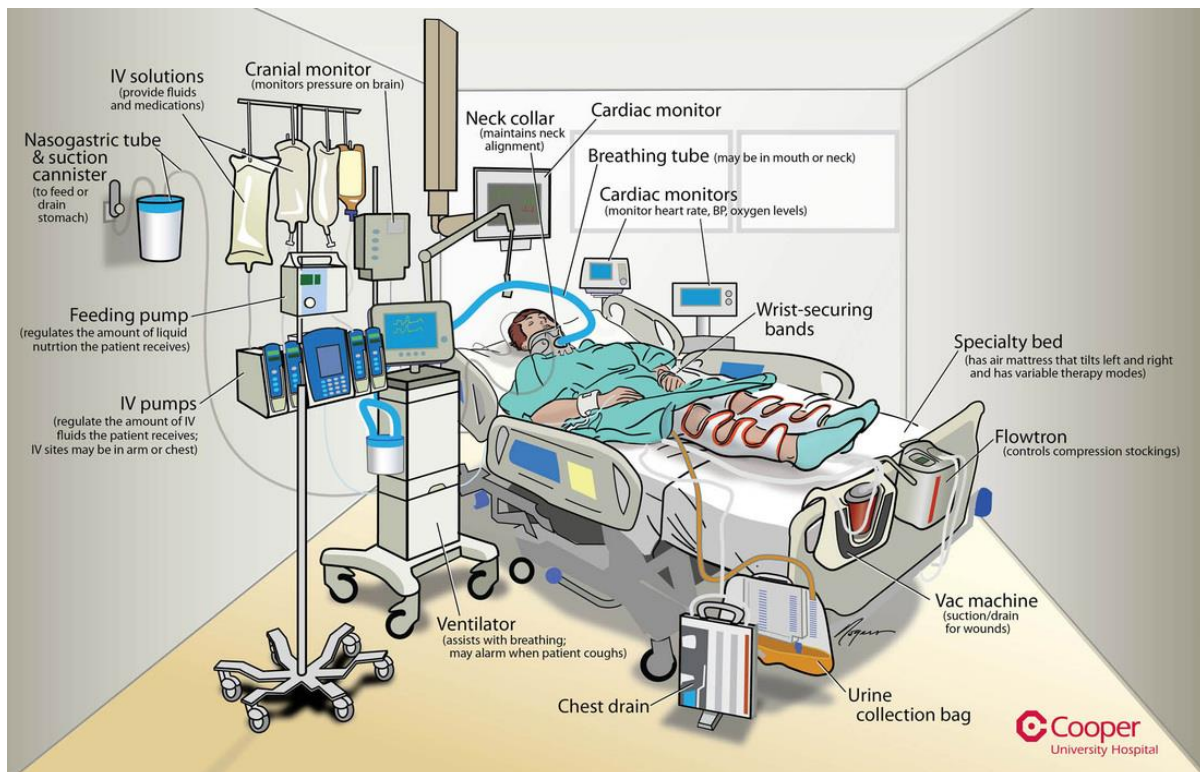
Version	Author	Issue & circulation date	Summary of changes
1	Lyn Maughan Yvonne Stillwell	May 2017	
2	Jade Purdy	February 2023	Updated content and staff
Contact	Jade Purdy		

Useful contacts

Intensive Care Unit	Reception ICU Sue Giles	06 356 9169 ext 7300
Charge Nurse	Lyn Maughan	06 356 9169 ext 7304
Nurse Educator	Jade Purdy	06 359 9169 ext 7562 Pager 320

Contents

Welcome to our Intensive Care Unit.....	4
Expectations of the Student Nurse (nēhi ākongā).....	5
Visiting	6
Family and visitor's room	6
Mahi Tahi.....	6
Safety Measures in ICU	7
Admissions to the ICU	8
Learning Opportunities	9
Medications	11
Pre-reading/Resources	12
Treasure Hunt.....	13



Welcome to our Intensive Care Unit (ICU)

We are funded for a 6 bed ICU; we accept all subspecialties and ages. We have a 1:1 ratio for our intensive patients and a 1:2 ratio for our high dependency patients.

We hope that you enjoy your time with us and that you find it a worthwhile and interesting experience.

ICU can be a foreign environment for students who sometimes feel a little 'lost' or unsure of what's going on. This booklet provides you with information that will give you a bit of insight into our ICU and how we operate.

Please feel free to ask any questions or seek clarification of things you are not sure about. We are looking forward to working with you!

We have a **multi-disciplinary approach** to patient care

Medical Team

Dr Daniel Nistor	Intensivist/Medical Director ICU
Dr Rob Whitta	Anaesthetist and ICU consultant
Dr Gerard (Gerry) McHugh	Anaesthetist and ICU consultant
Dr Andrew Warnock	Anaesthetist and ICU consultant
Dr Sammy Lee	Anaesthetist and ICU consultant
Dr Mhetusare Jachi	Anaesthetist and ICU consultant
Dr Brent Boon	Anaesthetist and ICU consultant

We also have at least six registrars who work around a roster providing availability on the floor 24/7.

Nursing Team: (Senior Nurses)

Charge Nurse	Lyn Maughan
Nurse Educator (Kaiwhakaako Tapuhi)	Jade Purdy
Associate Charge Nurse	Sasha Brewer

We have a great team of Registered Nurses that work rostered and rotating 8 hours shifts over 24 hours

Allied Health Team

Ward Clark	Sue Giles
Physiotherapist	Malcolm Neall

We also use other specific services that are available when appropriate i.e., Pastoral Service (Chaplin), Pae Ora, interpreter service etc.

Your Preceptor

Unfortunately, during a three-week placement it can be difficult to allocate a set preceptor due to rostering requirements, however, we will do a best to ensure consistency.

If completing your Transition to Practice (TTP) you will be allocated one primary preceptor whose roster you will follow.

Within the first week ensure you identify your preceptor or staff member you will be working alongside most often and provide them with your objectives and administration requirements.

If you look at the roster, you will see your name highlighted/ an asterisk above your name. One of our nurses will have the same colour highlighted or asterisk correlated to your shift, this will be the person you will be working with for that shift.

Your preceptor may ask for feedback and assistance from others you have worked with to help complete your feedback/assessments.

We hope that you enjoy your placement with us! If there is anything we can do or if you have any problems, please don't hesitate to ask.

Expectations of the Student Nurse (nēhi ākongā)

Shift patterns within the ICU:

Morning	:	0700hrs to 1530hrs
Afternoon	:	1445hrs to 2315hrs
Night	:	2245hrs to 0715hrs

Our expectations of student nurses working within the ICU:

- It is expected that you arrive on time for your shift. If you are going to be late or are unable to come to work, call the unit on phone number 350 8015.
- You must complete the full shift that you are allocated to work. If you are unable to please discuss this with the Charge Nurse, your preceptor or nurse educator. A lot of learning occurs during downtime in the unit.
- It is important for your preceptor or the nurse you are working with that he/she is aware of your learning objectives. Please inform them of these at commencement of your shift and we will help to facilitate.
- Due to infection control please adhere to professional presentation standards such as a clean uniform, long hair tied back, no jewellery and nails short with no polish. Cardigans must not be worn when working on the floor. Please review the MDHB-2862/ 7716 policies should you require further information.

- If you are not achieving your objectives, please see Jade or your preceptor (asap and before your last week in the unit)
- Please ensure all documentation you need to complete for your polytechnic/university is accomplished before your last days in the unit – your preceptor may not complete paperwork that is given to them if it is given within the last days of your placement.
- If you are unsure about anything or have concerns, please don't hesitate to reach out to any member of the senior team.

Visiting hours

We often allow whanau to visit when they can, we ask that visiting is restricted between the hours of 0700-1100 to accommodate for Nursing handover and Doctors rounds where bedside discussions may breach patient confidentiality.

We may ask family/visitors to step out of the unit during procedures, x-rays, acute patient deterioration etc. We encourage family to finish visiting by 2000 to facilitate a settled night for their loved one.

We endeavour to provide a service that is culturally and spiritually sensitive to our patients and their families.

Family and visitor's room

We have a large waiting room where families and close friends can have some privacy, make a drink, and have some time out. The experience of having a loved one in ICU can be very stressful and difficult for families, thus we encourage them to take frequent breaks and look after themselves.

Mahi Tahī

Mahi Tahī Better Together is an initiative that acknowledges and recognises the important role loved ones have in the ongoing care of patients whether they are whānau, friends or caregivers.

We know health outcomes are better for those who are supported by loved ones, so our aim is to foster, support and respect the key role whānau, friends and caregivers have in the healthcare journey.

The Mahi Tahī Better Together programme involves patients having a Kaimanaaki Partner in Care during their hospital stay. This can be a whānau member, friend, or a caregiver.

A Kaimanaaki Partner in Care is the name given to someone who actively provides support, takes care of, gives hospitality to, protects, looks out for, and shows respect, generosity, and care for others. Kaimanaaki Partner in Care can enter the ward their loved one is admitted to at any time, are encouraged to help with care where appropriate and will be a main point of communication for staff on matters involving their loved one.

Each Kaimanaaki Partner in Care will be given a complete overview of the Mahi Tahī Better Together programme and an orientation to the unit by the charge nurse, or relevant staff

member. The orientation will include discussions on amenities, security, emergency and evacuation procedures, privacy, appropriate behaviour, parking, and refreshments.

Partners in Care will:

- Have open access to hot drink facilities, fridge, and a microwave.
- Have free parking.
- Be able to request a meal to eat alongside the patient.
- Be given an access card, where applicable.
- Be able to request a recliner chair to sleep on overnight.
- Have access to public toilets, as well as shower facilities at Te Whare Rapuora

Safety Measures in ICU

During a Cardiac Arrest or other emergency

Please feel able to get close enough to see what is going on but assess the best place to stand where you will not get in the way

You may be asked to send bloods to the lab in the Lampson tube

You may be asked to page various people (x-ray, lab, etc.)

You may be asked to get equipment

During a fire alarm

Please familiarise yourself with this on your first day. Alarms, fire extinguishers and smoke stop doors.

The area where ICU is located, is divided into “cells” by fire doors that should be closed in the event of a fire.

In all cases of fire or smoke, follow strict instructions from the fire warden. This will be most likely the person coordinating the shift.

When an intra venous pump alarms

Alert the nurse ASAP, some of the drugs infused in ICU must not be stopped! (i.e., inotropes/vasopressors)

If you are concerned about a patient please notify a RN, acute deterioration can happen quickly within the ICU and many eyes help keep our patients safe

Admission to the ICU

Admissions are accepted in discussion from the primary team (e.g., medical) to the ICU registrar and consultant. The ICU is a closed unit which means all admissions must be directed and accepted through the ICU consultant. Admission criteria can be found within the MDHB-2985 guideline.

We are funded as a 6-bed unit, staff availability and acuity dictate how many patients we can facilitate.

The ICU Registrar is available 24/7 and are generally situated within the unit. They are always on site and can be contacted through the hospital paging system (pager 328)

Patients that have specific need for neurological or cardio/thoracic surgery are transferred to the tertiary hospital that provides these services. A transport or retrieval team will be arranged for transfer.

Paediatrics patients are also admitted to ICU and if critically unwell will be stabilised and transferred to the National Children's Hospital – Starship.

Patients are admitted to our ICU from various places within the hospital

- Emergency
- MAPU
- Surgical/Orthopaedic
- CCU/Medical Wards
- Paediatrics
- Theatre

Reasons for Admission

- Haemodynamically unstable patients requiring blood pressure support
- Those who need close cardiac monitoring or nursing interventions outside the scope of a general ward
- Acute respiratory distress/failure
- Post-op patients who have a significant medical history and are at risk of complications
- Patients who are neurologically compromised and unable to reliably maintain their airway
- Patients requiring short to medium term ventilation or other respiratory support

Learning Opportunities

The following are suggestions/ideas for you to focus on to get the most out of your clinical placement in the ICU.

*Note- due to the acuteness of the ICU setting, student's work under the direction of an RN in all aspects of the patients care. The role of the student in ICU can often be as an observer.

- Assessing patient's condition and completing documentation
- Post-operative management
- Acute pain management
- Oxygen therapy and reasons why different equipment is used
- Care of the tracheostomy (dressings, suctioning, humidified circuits, potential complications etc).
- The role of the ICU nurse in patient advocacy: ethical dilemmas, withdrawing treatment, shared goals of care
- Assisting in the care of the dying patient
- Assisting in the care of a ventilated patient
- Assisting in the care of a patient on continuous positive airway pressure (CPAP)
- Assisting in the care of a patient requiring High Flow Nasal Oxygen therapy (HFNO)
- Assisting in the care of a patient with confusion/delirium
- Monitoring and emptying drains/stomas
- Monitoring and care of chest drains
- Monitoring of patient fluid and electrolyte balance
- Communication techniques for non-verbal patients
- Developing communication skills to communicate with members of the multidisciplinary team effectively and confidently
- Partake in assessment, planning and evaluation of patient care and interventions
- Providing patient/family centred care within the ICU
- Management/care of the long-term ICU patient

Common procedures

- CVL insertion
- Arterial line insertion
- Computerised tomography (CT scan)
- Magnetic resonance imaging (MRI)
- Gastroscopy
- Intubation/extubation
- Epidural and patient-controlled analgesia (PCA) monitoring.
- Removal of drains
- Chest-drain insertion/removal
- Wound care

Development of skills

- Neurological Assessment
- Cardiovascular Assessment
- Respiratory Assessment
- Patient risk assessment and management
- Care of the unconscious/sedated patient
- Oxygen therapy
- Specimen collection and result interpretation
- Dressings/wound care
- Ostomy care
- Tracheostomy care
- Suctioning (oral pharyngeal and endotracheal)
- Documentation and verbal handover
- Performing an ECG
- Drawing up intra venous (IV) medication
- Enteral feeding
- Priming and programming a nasogastric (NG) or nasojejunal (NJ) feeding pump
- Administration of medication via NG/PEJ/PEG tube
- Insertion of an NG tube
- Removal of intravascular cannulas (IVCs)
- End of life care
- Airway management
- Insertion of a urinary catheter (IDC)
- End of life care

Common Presentations to ICU

- Multi Organ Failure (MOF)
- Cardiac arrest (community or hospital)
- Haemorrhage (Gastrointestinal bleeds, Post-Partum Haemorrhage (PPH))
- Traumatic Brain Injuries (TBI)
- Deliberate self-harm/overdose
- Exacerbation of COPD/asthma
- Pneumonia/ respiratory failure
- Shock (septic, cardiogenic, hypovolaemia, anaphylactic)
- Pancreatitis
- Abdominal Aortic Aneurysm (AAA)
- Status epilepticus
- Diabetic Keto Acidosis (DKA)
- Post op general surgery (generally with many medical co-morbidities) that have been assessed as “high risk” during pre-operative anaesthesia assessment and referred for elective admission post operatively.
- Major surgeries e.g., Ivor-Lewis procedure, urological procedures e.g., Hartmann’s procedure, Cystoprostatectomy; Whipple’s procedure
- Trauma e.g., chest trauma, abdominal trauma
- Spinal Injuries
- Acute kidney injury requiring Continuous Renal Replacement Therapy (CRRT)
- Neutropenic Sepsis (often oncology related)

Medications

As a student you are given the opportunity to learn and participate in the care of patients receiving intravenous and related therapies. It is therefore vital that you always follow your preceptor's instructions and adhere to standards set by our organisation.

Use and read the IV resource book for students as a primary IV learning resource. Please complete the provided "Intravenous & Related Therapies" pamphlet with drug calculations and return to either Jade or Sasha for marking prior to administering medications under direct supervision of an RN.

DO NOT:

- Insert peripheral catheters
- Perform phlebotomy
- Access central venous access devices (CVAD)
- Program PCA pumps

Learn to do these activities under the direction of a registered health professional

- Prepare and reconstitute an IV medication (e.g., an antibiotic)
- Administer a saline flush or an antibiotic through a peripheral IV cannula
- Prime an IV infusion set and administers an IV fluid through an electronic infusion device
- Watch how to set up a blood product transfusion and observe how it is commenced
- Remove a peripheral IV cannula

Intravenous medications commonly used in ICU

- Inotropes (e.g., Noradrenaline)
- Vasopressors (e.g., metaraminol)
- Morphine
- Fentanyl
- Propofol
- Midazolam
- Antiemetic – Metoclopramide, Cyclizine, Ondansetron
- Electrolytes - Potassium, Phosphate and Magnesium
- Antibiotics
- Amiodarone
- Digoxin
- Frusemide
- Paracetamol

Pre-reading/Resources

We do not expect you to do a lot of pre reading before you start your placement. The ICU is a great place to learn, it is important that you take all opportunities available to gain experience in different situations. We foster a supportive adult learning environment in ICU, if you do not understand or need clarification for anything we encourage you to ask to ensure your understanding, no question is meaningless.

You will find that there is downtime within the ICU, this will give you an opportunity to read up about subjects, illnesses that patients present with, policies and guidelines etc. We have numerous Intensive care resources available to you located in the Charge Nurse office.

If you are overwhelmed or struggling with any situation that may arise in the ICU, please discuss this confidentially with any member of the senior team or your preceptor, we may be able to provide you with the advice/support you need.

<https://www.uptodate.com> (access available through the MDHB intranet or your educational provider)

<https://litfl.com> (critical care education and resources)

<https://www.lecturio.com>

<https://oslercommunity.com> (critical care education)

Lippincott procedures (available through the MDHB intranet)

Treasure Hunt

This list is designed to help you become familiar with the environment but is by no means exhaustive of all the things you will be required to locate

- Monitoring system
- IV fluids and tubing
- Controlled Drug cupboard
- Defibrillator Trolley
- Intubation and emergency equipment
- Drug trolley
- Paediatric emergency trolley
- Suction equipment
- Linen supplies
- CN Office
- NE Office
- Staff toilets/showers
- Equipment room
- Staff tearoom/ kitchen
- Sluice room
- Dressing materials
- Nasogastric equipment
- Urinary catheterisation equipment
- Lampson tube System
- Syringes and interlink/ needles
- Portable oxygen cylinders
- Clinical policies & procedures
- "Notes on Injectable Drugs"/ IV compendium
- Evacuation/ Emergency procedures
- Linen trolley
- Drug fridge
- Roster
- Suction equipment
- Bio-hazard bags
- Stationery supplies
- Photocopier
- Patient charts
- Wash trolleys
- Art and CVL trolleys
- Sterile gloves
- Where to store your bags
- Oral Medications



Te Whatu Ora

Health New Zealand

Te Pae Hauora o Ruahine o Tararua
MidCentral

Intravenous & related therapy resource for students

TE PAE HAUORA O RUAHINE O TARARUA- MIDCENTRAL

INTRAVENOUS & RELATED THERAPIES – PRACTICE DEVELOPMENT UNIT

Updated February 2023

Acknowledgements: Central Region District Health Boards & Catherine O’Hara

Introduction

This resource is designed to assist students in gaining knowledge, confidence, and skills in performing basic intravenous therapy. The content of this resource relates only to the Basic Principles of I.V. Therapy and **DOES NOT INCLUDE**

- Insertion of peripheral I.V. catheters.
- Phlebotomy.
- Management of central venous access devices (CVAD).
- Management of patient-controlled analgesia (PCA).

IMPORTANT POINTS

- This resource is a supplement for student learning and skill development
- Completion of this resource does not equate to being certified in Fundamental I.V. & Related Therapies
- A student is not allowed to manage any I.V. therapy unsupervised
- A student must work under the **direction and delegation** of a registered health practitioner when providing I.V. & related therapy care
- Further resources can be found on the Midcentral intranet
<http://staffintranet.midcentraldhb.govt.nz/Services/IVT/IV%20Therapy%20Documents/Forms/AllItems.aspx>

Supplemental web sites

<http://www.ins1.org/> - Recognised as the global authority in infusion therapy, INS is dedicated to exceeding the public's expectations of excellence by setting the standard for infusion care.

<http://www.ivteam.com/> - IVTEAM is an online resource for the practitioner working in the field of IV therapy.

<http://www.iv-therapy.net/> - Focus on vascular therapy. Includes Chat forums, Great photos of IV related problems, Numerous IV related articles

DEFINITION OF TERMS

(Source: Nursing Council New Zealand)

- **DELEGATION** - The transfer of the responsibility for the performance of a task/activity from one person to another, with the former person retaining accountability for the process and the outcome.
- **DIRECTION** - The active process of directing, guiding, monitoring, and influencing the outcome of an individual's performance of a task/activity related to assigned aspects of patient care.
- **DIRECT DIRECTION** – Direction is provided when the registered health professional is present, observes, works with, and directs the person who is being supervised. Direct direction is required when assessing the skill or competency level of another.
- **INDIRECT DIRECTION** - Direction is provided indirectly when the registered health professional is in the same facility or organisation as the supervised person but does not constantly observe his/her activities. The registered health professional must be available for reasonable access (e.g., on-site, and accessible within a few minutes).
- **DOUBLE CHECKING** - Double checking must be performed in situations where it is appropriate or legally necessary- e.g., when checking controlled drugs, blood products, dosage calculations, etc.

IV Medicines Administration Decision Making Framework

Medication prescribed APP on the patients medication chart

Identify any concerns:

Skill/knowledge:

- Appropriate knowledge of the medication
- Skill to administer and/or monitor the patient

The medication:

- High risk of side effects/potential for error (see list)
- Right dose, route, medication

Monitoring:

- Is the staffing skill mix adequate/ allows for appropriate monitoring of the patient
- Does the medication require a high degree of monitoring/frequency of observations required e.g., telemetry

The Route:

- Route of administration increases risk e.g., central line

Resolution

Drug Data:

Ministry of Health/Medsafe datasheets (not exclusive):

- Concentrated potassium bolus
- Heparin
- Insulin Infusion
- Morphine or another Opioid
- Cytotoxic drug
- Intravenous infusions

Make the decision:

Inappropriate to administer medication? Discuss with senior nurse in charge:

- Analyse the individual situation
- Use clinical judgement to decide to administer or not based on the risk vs benefit to the patient
- Use resources (see list) available to guide administration decision
- Inform prescriber of issues/concerns of administration

No

Resources:

Senior nurses in area/
Coordinator/ACN/CNM/Educator

After-hours management (AHM)

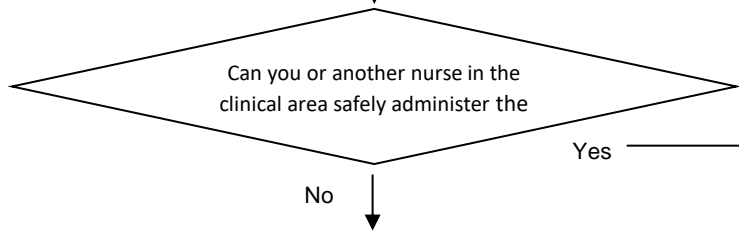
Notes on Injectable Drugs

Pharmacist

Transfusion medicine department

IV Compendium & MAPC Manual
<http://staffintranet.midcentraldhb.govt.nz/DocumentCentre/Pages/Home.aspx#>

New Zealand Formulary
Medsafe <http://www.medsafe.govt.nz/>



The nurse caring for the patient takes responsibility for ensuring the patient receives medication in a timely manner by making alternative arrangements.
NB: inform medical staff of potential delay to administration

Options for administration include:

- Medical staff administers
 - Clearly documents a management plan in patients notes (monitoring requirements, when to notify Dr etc.)

Senior nurse in charge supports following:

- Appropriate trained and skilled senior nurse from another area administers or supervisors' administration
- Patient is transferred to a more appropriate clinical area for administration, e.g., ICU, CCU

Medication Administered

- Ensure management plan in place (monitoring requirements, when to notify Dr etc.)
- Document process & actions taken
- Complete Riskman incident form if required (e.g., significant delay in administration)

Seek advice from Medical staff, Senior Nurse in Charge/DNM/Pharmacist

- Document
- Complete incident/event form on Riskman
- Inform prescriber of issues involved

Dosages & calculations

Know Your Basic Drug Calculations

- 1 kilogram (kg) = 1000 grams (g)
- 1 gram (g) = 1000 milligrams (mg)
- 1 milligram (mg) = 1000 micrograms (mcg)
- 1 litre (L) = 1000 millilitres (ml)

To convert grams into milligrams, **multiply** the grams by 1000

To convert milligrams to micrograms, **multiply** the milligrams by 1000

To convert micrograms into milligrams, **divide** the micrograms by 1000

To convert milligrams to grams, **divide** the milligrams by 1000

Example:

Express 4200 grams in kilograms... Answer: $4200 \text{ g} \div 1000 = \mathbf{4.2 \text{ kg}}$

Express 1.5 grams in milligrams... Answer: $1.5 \text{ g} \times 1000 = \mathbf{1500 \text{ milligrams}}$

Express 3000 milligrams in grams... Answer: $3000 \text{ mg} \div 1000 = \mathbf{3 \text{ grams}}$

Drug Dosage Formula

(What you want \div What you have) \times Volume in ml.

Example:

Prescribed dose = 20 mg.

Stock dose = 80 mg / 10 ml

Answer: $(20 \text{ mg} \div 80 \text{ mg}) \times 10 \text{ ml} = \mathbf{\text{Give } 2.5 \text{ ml}}$

Using Body Weight

mg/kg - mg \times patient mass in kg

mcg/kg - mcg \times patient mass in kg

Example:

The dose for drug "A" is 10 mg / kg / every 8 hours. The patient weighs 48 kg. How milligrams of the drug should the patient receive every 8 hours?

Answer: $10 \text{ mg} \times 48 \text{ kg} = \mathbf{\text{Give } 480 \text{ milligrams every } 8 \text{ hours}}$

Percentages %

Percentages as expressed in intravenous solutions refer to the number of grams dissolved in 100 ml of solution

Example

Glucose 5% means there is 5 grams of glucose / 100 mL

Glucose 10% means there is 10 grams of glucose / 100 mL

Glucose 50% means there is 50 grams of glucose / 100 mL

Fluid Rate Formula (ml/hr)

$$\text{Volume to be infused} \div \text{Hours to be infused}$$

Example

Administer 1000 ml of 0.9% Sodium Chloride over 8 hours

Answer: $1000 \text{ ml} \div 8 \text{ hours} = \text{Rate of infusion is } 125 \text{ ml/hr}$

Fluid Rate formula (drops/ min)

$$\frac{\text{Volume to be infused (ml)} \times \text{Drop Factor}}{\text{Time (min.)}}$$

Example

Administer 1000 ml of 0.9% Sodium Chloride over 8 hours. The drop factor of the IV administration set is 20 drops/ml.

Answer: $(1000 \text{ ml} \times 20) \div 480 \text{ minutes} = 41.6 \text{ drops /minute (round-off to } 42)$

What is a “DROP FACTOR”? The number of drops needed to make up 1ml. The drop factor may vary depending on the infusion line being used. The drop factor is always printed on the packaging.

What’s the use of calculating DROP RATES when we have electronic pumps? Drop rate calculation is a basic calculation skill in IV therapy. You may need to calculate drop rates when an electronic infusion device is unavailable.

Body Surface Area / BSA (m²): Mosteller formula.

Get the square root (√) of:

$$\text{Height (cm)} \times \text{Weight (kg)} \div 3600$$

Example

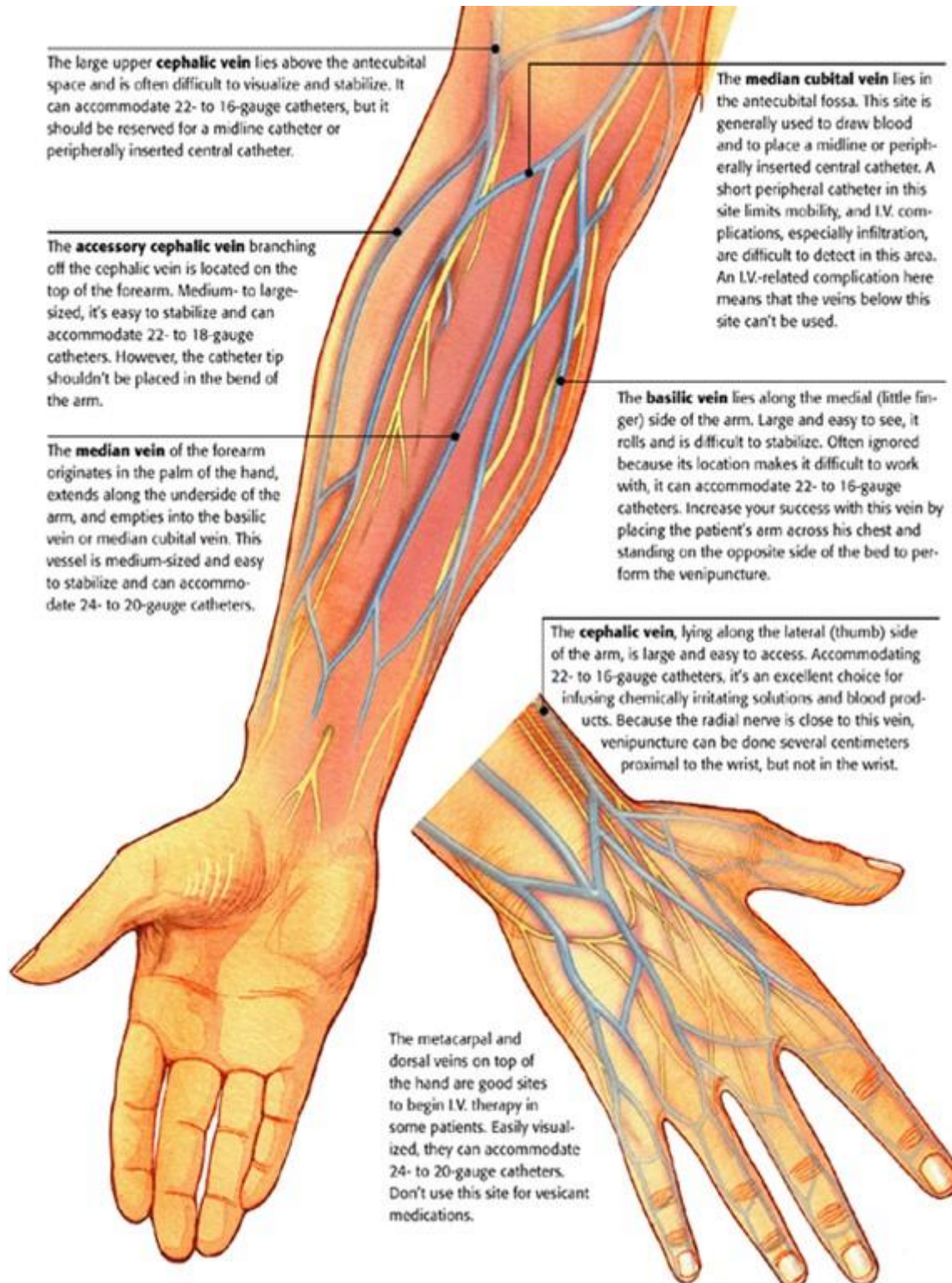
Patient "A" is 170 cm tall and weighs 85 kg. What is the patient's BSA?

Answer: $(170 \text{ cm} \times 85 \text{ kg}) \div 3600 = 4.013$

Press the square root $\sqrt{\quad}$ function for 4.013, the BSA is = **2.003**

Fundamental intravenous knowledge

PIVC SITE



Pivc gauges and maximum flow rates

GAUGE	COLOUR	MAX. FLOW RATE	USE
14g	Red	19,800 ml/hr	Fluid resuscitation Surgery
16g	Grey	13,200 ml/hr	Fluid resuscitation Surgery
18g	Green	6,300ml/hr	IV infusions inc. blood Bolus medication
20g	Pink	3,800ml/hr	IV infusions Minimum size for blood product transfusion
22g	Light blue	2,160ml/hr	IV fluid infusions Frail, elderly & young
24g	Yellow	1,440ml/hr	IV fluid infusions Neonates, children, & frail

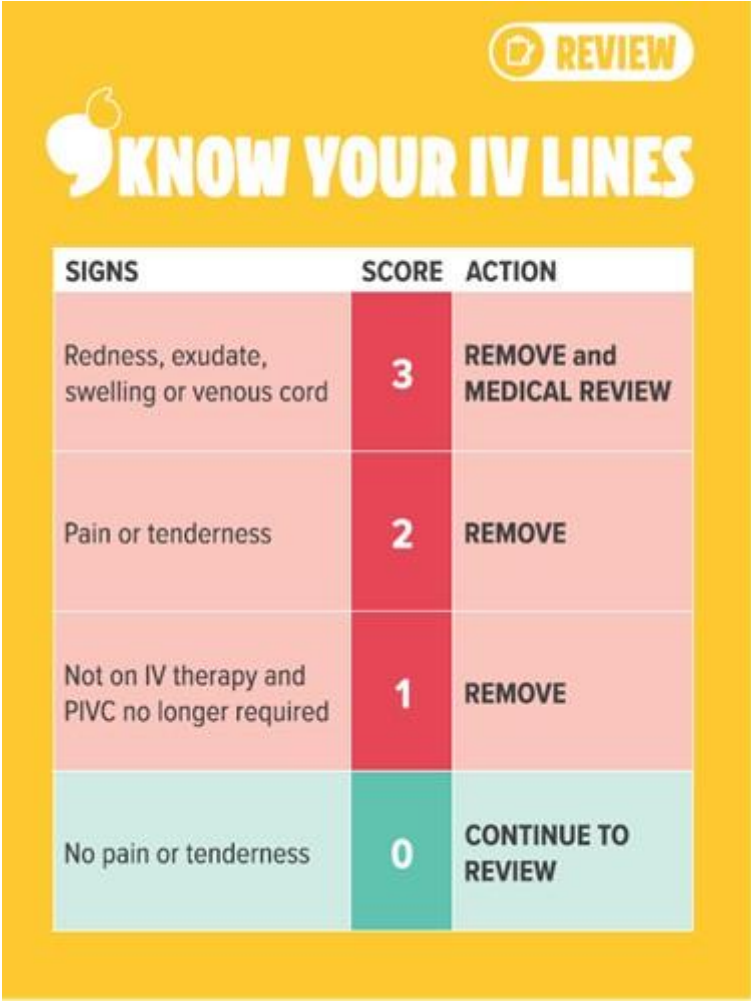
REMEMBER:

G-20 (pink) is the smallest gauge recommended for **adult blood transfusion**.
G-22 (blue) is the smallest gauge recommended for **pediatric blood transfusion**.
G-24 (yellow) is the smallest gauge recommended for **neonatal blood transfusion**.

PHLEBITIS

It is important for all health practitioners caring for PIVC's to understand and recognize phlebitis. Early identification of phlebitis is necessary to ensure prompt treatment and prevent the development of other complications e.g., line sepsis.

The phlebitis scale



KNOW YOUR IV LINES REVIEW

SIGNS	SCORE	ACTION
Redness, exudate, swelling or venous cord	3	REMOVE and MEDICAL REVIEW
Pain or tenderness	2	REMOVE
Not on IV therapy and PIVC no longer required	1	REMOVE
No pain or tenderness	0	CONTINUE TO REVIEW

Note: Remove short peripheral intravenous cannula when clinically indicated, based on findings from site assessment and/or clinical signs and symptoms of systemic complications.

If you observe phlebitis on your patient's I.V. site, you should document the following in the patient's notes:

- Date, work shift, and time
- Location of the phlebitis (e.g., right antecubital fossa)
- Description of the phlebitis (e.g., red, inflamed, pus / discharge etc.)
- Actions taken (e.g., swabbed for culture, medical team/RN informed)
- Any relevant history (e.g., multiple venipuncture attempts on the same spot)
- Mark area of erythema

Management and care of a peripheral intravenous catheter (pivc)

The S-A-S Protocol

When accessing a peripheral PIVC to give fluid or a medication, always follow the S-A-S protocol.

- **S** - Sodium chloride 0.9% flush (3 – 5 ml is sufficient). *To test the PIVC patency
- **A** - Access / Administer the drug or fluid
- **S** - Sodium chloride 0.9% flush (3 – 5 ml is sufficient). *To flush the medication and maintain patency

REMEMBER:

When flushing an PIVC, ALWAYS lock it using the **positive pressure technique**. This is done by simultaneously engaging the clamp on the PIVC while flushing the last few milliliters of Sodium chloride 0.9%. This “locking under positive pressure” will prevent blood from drawing back into the PIVC thus, reducing the chances of occlusion.

The Blocked IV Cannula



When you experience **partial resistance** while flushing an PIVC, it is acceptable to try to unblock it by applying gentle pressure while flushing. If **full resistance** is felt, even after application of gentle pressure, it is advisable to remove and re-site the IV cannula. Forceful flushing of an occluded IV cannula is not recommended as the force may dislodge a blood clot, cause pain, or damage the vein.

The Leaking PIVC

A leaking PIVC is best observed during flushing or during an infusion. The tell-tale signs are *wet linen*, *wet clothing*, *moist IV dressing*, and a *wet PIVC site*. If you observe this, assess the PIVC site for the source of the leak.

If the leak comes from the **insertion site**, it is recommended that the PIVC be removed. The PIVC may have been pulled out, bent, or damaged.

If the leak is coming from the **connection** (where the PIVC is connected to the extension set or access valve), simply secure the connection by ensuring the luer-lock connection is tight. If no leak is observed, you may re-secure the PIVC by putting on a new dressing.

Removing a PIVC

Removing a PIVC is simple and easy. It is also relatively painless using the correct technique.

Equipment

Gloves, nonsterile
Alcohol wipes
IV Pressure pad
Sterile gauze squares
Tape
Sharps container

Verify that removal of cannula is required.

1. Accurately identify the patient using their wristband and hospital number in addition to verifying the patient details verbally.
2. Ensure the patient understands the cannulation removal process and that verbal informed consent is obtained.
3. Position the patient comfortably using a pillow to support their arm if necessary. Place a paper towel or incontinence sheet under the patient's arm.
4. Cleanse hands and apply gloves.
5. Remove all tapes and carefully loosen skin from edges of the transparent dressing over the IV site (use stretch method or alcohol wipe to loosen dressing material).
6. Place sterile gauze square over the IV insertion site and slowly withdraw the catheter in one motion; do not apply pressure over the catheter while removing, once catheter is removed place on paper towel.
7. Apply firm pressure over the venipuncture site once the catheter is removed for 30 seconds minimum.
8. Examine catheter for integrity and intactness.
9. Dispose of catheter in sharps container.
10. Apply IV pressure pad or new gauze and tape over site.
11. Assess for signs of redness, swelling or purulent drainage.
12. If patient is being discharge educate about site care. IV pressure pad should be removed after 2 hours to prevent pressure injuries.
13. Document removal, site assessment and catheter integrity.

Adverse effects of transfusion

(Source: New Zealand Blood Service, 2008)

Transfusions can be beneficial but like most medications carry with it risk. Good clinical practice is based upon understanding the benefits and risks that each treatment can provide for patients.

Blood transfusion has become safer over the years as various viruses and infectious hazards have been identified through donor selection procedures and blood screening tests. Though much effort is put into ensuring the safety of the transfusion, transfusion-related adverse events may still occur. Data on the occurrence of adverse reactions and incidents are collected as part of NZBS' hemovigilance activities.

REPORTING ADVERSE REACTIONS OR INCIDENTS

Serious or acute life-threatening reactions are rare, any new or unexpected symptoms during a transfusion must be taken seriously as they may be an early warning of a serious reaction.

- Severe reactions are most likely to occur within 15 minutes of starting the transfusion of each individual unit of blood products.
- It is extremely important to **closely monitor** the patient during this **initial 15-minute** period. If no reaction is apparent, continue to record temperature, pulse, respiratory rate, and blood pressure again after 30 minutes and then hourly. And again, at the end of the transfusion.
- Serious events must be discussed with a NZBS Transfusion Medicine Specialist or clinical haematologist for advice on further management of the patient, laboratory investigations and future transfusion requirements.

Signs and Symptoms of Anaphylactoid/Anaphylactic Reactions (Transfusion Medicine Handbook, NZBS, 2008)

Symptoms	Signs
Dyspnoea Chest pain Abdominal pain Nausea	Hypotension Bronchospasm Periorbital and laryngeal oedema Vomiting Erythema Urticaria Conjunctivitis





Signs and Symptoms of Acute Haemolytic Reaction (Transfusion Medicine Handbook, NZBS, 2008)

Symptoms	Signs
Feeling of apprehension or “sense of impending doom” Agitation Pain at the venepuncture site Pain in the abdomen, flank, or chest Dyspnoea	Unexplained fever Flushing Hypotension, or sudden onset of hypertension General oozing from wounds or puncture sites Hemoglobinemia Haemoglobinuria Skin rash

Bacterial Contamination: Signs and symptoms of septic reaction includes: (Transfusion Medicine Handbook, NZBS, 2008):

Fever (temperature $\geq 38.5^{\circ}\text{C}$ or a rise from baseline of $\geq 1.5^{\circ}\text{C}$)
Rigors
Nausea/vomiting
Diarrhoea
Hypothermia
Tachycardia (≥ 120 beats per minute or change from baseline of ≥ 40 beats per minute)
Hypotension or hypertension (rise / fall in systolic blood pressure of ≥ 30 mm Hg)
Haemolysis
Shock
Multiple organ failure during or immediately after the transfusion

Intravenous equipment

	<p>Alcohol swabs are used to thoroughly cleanse the injection ports and access valves prior to each access. When cleansing the access ports scrub for 15 seconds and wait for 15 seconds to dry.</p>
	<p>Prefilled sodium chloride 0.9% syringes are quick and easy to use. While the cap is still secure, push on the plunger to release the stopper seal (a small 'click' will be felt). Once the seal has been disengaged the syringe is ready to flush.</p>
	<p>Blunt fill needles are used to draw up diluents from ampoules e.g., Water for Injection or Sodium Chloride 0.9% or when mixing medications using vials with rubber stoppers. You can also use the BLUNT FILL NEEDLE to inject additives into IV bags.</p>
	<p>Blunt filter needles are used to draw up medications from glass ampoules because of the potential presence of glass fragments or sediments.</p>



Infusion sets are used to give IV medicines. They can be used with or without an electronic IV pump. These infusion sets can be used for 72 – 96 hours. When giving medications or blood products, follow your clinical area’s protocol for hang times.






Mechanical valves and split septum injection caps are *needle-less* access devices. They can be found on the patient’s IV extension set or as a side port on an infusion set. Before you access these, make sure that you scrub the hub for 15 seconds using an alcohol swab and wait to air dry. Secure your syringe onto the access valve by luer-locking.



The Alaris System infusion pump is used for delivering IV fluids, blood products, and medications. It is recommended to always keep the pump plugged-in to keep the battery charged. Faulty pumps must have a Beims form completed and sent to the Biomedical Engineering department for repair.



The Alaris syringe driver is used for delivering IV infusions and medications. There are two models CC (critical care) and GH (general hospital)

	<p>The NIKI T 34 is a portable syringe driver primarily used to deliver subcutaneous infusions.</p>
	<p>Glass ampoules contain medications and solutions. The easiest way to break an ampule is to hold it securely and break it with the dot pointing 'away from you'. Holding onto the ampoule <i>too tightly</i> may result to a complete breakage of the whole ampoule.</p>
	<p>Medication vials may contain medications and solutions in either powder or fluid form. Vials are sealed with plastic tops and have rubber stoppers. Make sure that you cleanse the rubber tops with alcohol swabs before accessing with a blunt needle.</p>
	<p>Reduce the risk of needle stick injury by disposing your sharp equipment (needles, spikes, air inlet needles, broken ampoules etc.), in the sharps bin.</p> <p>We encourage clinicians to dispose of sharps "at the point of contact" and not to carry sharps around in unsafe containers.</p>

As part of your training, it is important that you know the various intravenous equipment, their uses, and the correct disposal. Your role in equipment selection is to ensure the safe and effective delivery of IV therapy health care to the patient.

Fluid balance chart management

The purpose of fluid balance charts (FBC) is to ensure fluid intake and output are accurately monitored.

The hydration status of patient's receiving intravenous therapy is assessed each day.

- (a) All intravenous fluids (IVF) infused via an Electronic Infusing Device (EID) should be visually checked every 30 – 60 minutes to see if the infusion is being delivered correctly.
- (b) Free flowing fluids (e.g., gravity - not infused via an EID) are checked every 15 – 30 minutes because fluids will sometimes infuse “too fast” or “too slow” depending on the PIVC placement, patient movement, height of the infusion, etc.
- (c) Consider recording fluid intake and output every hour onto fluid balance chart if there are additives in the fluid, if being delivered with a burette or EID, or if the patient's condition calls for it (e.g., renal failure, congestive heart failure).
- (d) When a patient is on an EID cross check volume infused against fluid balance chart prior to clearing total.
- (e) Fluid balance charts are to be totaled at the end of each shift.
- (f) The 24-hour total is then entered onto a fluid balance summary.
- (g) All columns are to be totaled prior to transfer from one unit to another.

REMEMBER:

Fluid balance charts are required to record fluid input and output of all patients receiving intravenous therapy.

A fluid balance summary chart must be used to record the daily totals from the fluid balance chart and hydration charts.

The fluid balance chart must be retained as part of the patient's record.

Practical skill activities

Learn to do these activities under the direct direction of a registered nurse (see Appendix 1):

1. Prepare and reconstitute an IV medication.
2. Administer a sodium chloride 0.9% flush or an antibiotic through a peripheral IV cannula.
3. Prime IV infusions set and administer an IV fluid using an electronic infusion device.
4. Observe how to set-up a blood product transfusion and observe how it is commenced.
5. Removal of a peripheral IV cannula.

REMEMBER:

The 5 Rights of medication administration.
The indication, action, side effects and adverse effects of medications / IV fluids.
Patient communication and gaining consent.
Patient assessment (before, during, and after).
Use of the right equipment.
Observe infection prevention & control.
Documentation

REFERENCES:

Alexander, M. Corrigan, A. (2011) Core curriculum for infusion nursing. (4th ED, Norwood, Lippincott, Williams & Wilkins.

Dougherty, L. & Lamb, J. (2008). Intravenous therapy in nursing practice. (2nd ED, Wiley-Blackwell.

Higginson, R., & Parry, A. (2011). Phlebitis: treatment, care & prevention. *Nursing Times*, 107 (36), 18-21.

Jackson, A. (1998). A battle in vein: infusion phlebitis. *Nursing Times*, January 28,94, (4), 70 – 71

New Zealand Blood Service (2008). Transfusion Medicine Handbook.

Weinstein, S. M. (2007). Plumer's principles & Practice of Intravenous Therapy. (8th ED), Philadelphia: Lippincott, Williams & Wilkins.

Appendix 1

Student Nurse/Midwife: _____

Learn these activities under the <u>direct direction</u> of a registered nurse:	Student Achieved sign & date	Validation IV Assessor Name, sign & date
1. Drug Calculation Questions		
2. Prepare and reconstitute an IV medication.		
3. Administer a sodium chloride 0.9% flush or an antibiotic through a peripheral IV cannula.		
4. Prime IV infusions set and administer an IV fluid using an electronic infusion device.		
5. Observe how to set-up a blood product transfusion and observe how it is commenced.		
6. Removal of a peripheral IV cannula.		

Evaluation of your preceptor

Please return your evaluation to your Charge Nurse or Nurse Educator

Name of Preceptor _____ Date _____

E = Excellent **VG** = Very Good **S** = Satisfactory **NI** = Needs Improvement

Please read the following statements then tick the box that best indicates your experience

My Preceptor:	E	VG	S	NI
Was welcoming and expecting me on the first day				
Was a good role model and demonstrated safe and competent clinical practice				
Was approachable and supportive				
Acknowledged my previous life skills and knowledge				
Provided me with feedback in relation to my clinical development				
Provided me with formal and informal learning opportunities				
Applied adult teaching principals when teaching in the clinical environment				

Describe what your preceptor did well

Describe anything you would like done differently

Signed: _____ Name: _____

Your contact details

We care about your well-being as well as your education. If you don't arrive for a planned shift, if there is illness on the ward or in the case of an emergency, we need to be able to contact you. Please could you provide the ward with your contact details and an emergency contact using the form below.

Your Name	
Your Home Phone number	
Your mobile phone number	
Name of emergency contact	
Phone number of emergency contact	

From time to time the staff on the ward may need to contact your lecturer regarding your progress, for support or in the case of problems. Please could you supply the contact details of the Lecturer/CTA that will be supporting you during this placement, in the form below?

Name of Lecturer/CTA	
Phone number of Lecturer/CTA	

This information will be kept for the length of this placement and then disposed of. It will not be shared with anyone else without your permission unless there is an emergency.