

STUDENT INFORMATION AND WORKBOOK



**Welcome to
Paediatric Intensive Care
Ward 2**

Matthew Hick and Jenny Gillies 2009

GENERAL INFORMATION

PAEDIATRIC INTENSIVE CARE

Hello _____

Welcome to Paediatric Intensive Care (Ward 2) at Leeds General Infirmary. Throughout your placement here on PICU you will be part of our team of nurses and other medical professionals, delivering a high standard of individualised care to the children and their families on the unit.

This package has been developed to try and help you to gain the most from your placement. We hope you enjoy your experience working as part of our team; we endeavour to provide you with a wide variety of learning opportunities.

Whilst on placement you will be allocated two mentors
Your mentors are _____

Shifts will be allocated to you to ensure that you work with your mentors. However there is some flexibility, but you will need to organise and work alongside your mentors for the majority of your shifts. Your mentors are there for support and guidance throughout your time within PICU, allowing you to maximise your time. Our normal shift patterns can be seen below.

PICU shift pattern

Day shift	07.30 -20.00	Early shift	07.30-15.30
Night shift	19.30 - 08.00	Late shift	12.30-0800

By speaking to your mentor your shifts can be negotiated if necessary, but you must ensure that there are no more than 2 students on per shift. This is to maximise learning opportunities.

Contact

0113 392 7102 is our direct line.

Please speak to one of the Student Placement Coordinators; Jenny Brown, Abby Secker or Angela Snelson

Location

We are located in Jubilee Wing on C Floor.

Enter Jubilee Wing via the main entrance, walk through the main foyer and take the lift or stairs to C floor. On C floor turn left onto the corridor and Ward 2 is located just to your left.

Notice Board

There is a student notice board located in the staff room on the unit with lots of useful information. There is also a mailbox so please check on a regular basis.

Reporting Sickness/Absence

If you are sick or late for duty, you need to phone the ward and speak to the shift leader as soon as possible, preferably at least 4hrs prior to your shift starting. You must also ring when you are fit for duty again.

It is your responsibility to report sickness/non-attendance to the allocation team at the School of Nursing and Midwifery.

Uniform Policy/Security

You must always wear both your University uniform with a clearly displayed ID badge and identify yourself as a student nurse.

Health and Safety/Useful Phone Numbers

You must have undertaken a manual handling update within the last year, in order to carry out any patient or equipment manoeuvre.

Emergency Bleep Number for Cardiac Arrest: 2222

About Ward 2

There are a total of 10 beds on the unit, we offer care to children from the ages of 0 to 16 years. Their individual needs will vary depending on the nature of their admission. Each bed space is equipped in the same way. Daily safety checks are carried out to ensure the safety of staff and patients. You will be expected to be involved in these checks at the beginning of each shift. Ward round starts at around 0830. Each patient is discussed in detail and parents are asked to leave the ward during this period for confidentiality reasons.

During your placement you will come into close contact with the patients on the unit. In accordance with NMC guidance your activities should always be under the supervision of a registered nurse. You will be observing care being given, helping provide care and later, fully participating in providing care and managing your own work load. At all times you should work only within your level of understanding and competence, asking appropriate questions to clarify uncertainty.

As a pre-registered student you are never professionally accountable in the way that would later affect an application to the NMC. As far as the NMC is concerned it is the registered practitioners with whom you are working, who are professionally responsible for the consequences of your actions or omissions. This is why you must always work under direct supervision of a registered nurse. This does not mean however, that you can never be called to account by your university or by the law, for the consequences of your actions or omissions.

Mentorship

As a team we take student learning very seriously and aim to support you as well as we can.

The aim of this Intensive Care placement is to provide an environment in which you can learn and practically apply transferable acute care skills. In this placement you will need to be able to apply theoretical knowledge to the practice of assessment, planning, implementation and evaluation of nursing care. It will be helpful for you to revise the basic anatomy and physiology of the main body systems so you can observe and understand the effects illness and disease have on all the systems of the body and on the individual as a whole.

We are aware that you will have several skills assessments to complete during this placement and that it is important for you to achieve a number of them. From experience however, we feel you will get the most of this placement if you also try and consider other learning opportunities.

In addition to your skills, suggested *Learning outcomes* include:

- Be part of the morning ward round, both medical and with the physiotherapists (as appropriate).
- Understand infection control issues in the acute care environment. Ensure that you are familiar with Trust policies.
- Understand how to communicate effectively with members of this large MDT, the patients and the families.
- Understand principles of IV therapies including blood transfusions. You will get many opportunities to become familiar with handling IV medications, so use them.
- Become confident in the use of the observation charts, recording the observations, balancing fluids and checking the bed space at the start of each shift.
- Be familiar with managing your own patient workload.
- Observe on a crash call if the opportunity arises.

Expectations of learners:

- To contact the clinical area 2 weeks prior to commencing your placement.
- Adhere to our philosophy of care.
- To identify your learning needs at the start of your placement and discuss how they will be met during your first interview with your mentor.
- To be receptive to the learning opportunities available and be proactive in engaging in activities designed to meet your learning needs.
- To utilise the mid- and end-interview to jointly reflect on your own progress.

- Flexibility in the shift pattern in order to maximise contact time with your mentor and experience the 24 hour care of the NHS. If you change your off duty it is your responsibility to ensure that you work the minimum number of shifts with your mentors.
- To notify your mentor and/or other members of the team if you have a concern about this placement.
- If not able to discuss concerns with your mentor then please find another member of staff whom you feel comfortable with, or raise it with your university link lecturer.
- Evaluate the placement by giving constructive feedback.

Expectations of Placement

All students should receive as a minimum:

- You will be allocated two mentors for the duration of your placement and will be allocated to work with them as often as possible.
- A tour of the unit, placement area.
- An explanation of relevant policies procedures and guidelines.
- A copy of the unit student information pack.
- You should have your preliminary interview within the first 2 shifts of working with your mentor.
- You and your mentor should arrange provisional dates for intermediate and final interviews.
- You will be welcomed onto the ward and be treated as a valued member of staff by all of the MDT.
- Learning opportunities will be made available to students by all staff members where appropriate. All staff are responsible for student learning.

Medications

Patients on PICU will be given a wide variety of medications, some of which you will be familiar with from your time on the wards and some of them which will be new to you.

Certain medications are given routinely to the majority of our patients and it would be beneficial to have a basic understanding of these. For example, to know why they are used and the side effects they have and whether there are situations where it would not be appropriate to use them.

Find out about the following:

Morphine: _____

Midazolam: _____

Atracurium: _____

Diuretics: _____

Ranitidine: _____

On the ward you will find a variety of Paediatric medication formularies, and it is good to get into the habit of checking the doses of the medications prescribed for your patient. You can also find out information from the bedside folders.

We also use a Drug Infusion Calculator on PICU. Every patient will have one printed out on admission and one of the bedside safety checks is to ensure that it is present.

Group these drugs into the appropriate categories found on the following page inotropes, analgesics, sedation, paralysis etc

Adenosine	Midazolam
Adrenaline	Milronone
Aminophylline	Morphine
Amoxicillin	Nor adrenaline
Atenolol	Pancuronium
Atrovent	Paracetamol
Captopril	Penicillin
Cefotaxime	Phenobarbitone
Chloral Hydrate	Phenytoin
Ranitidine	Salbutamol
Clonidine	Spirolactone
Co proxamol	Vancomycin
Curosurf	
Dexamethasone	
Dnase	
Dobutamine	
Dopamine	
Erythromicin	
Fentanyl	
Frusemide	
Gentamicin	
Glycerol Trinitrate	
Ibuprofen	
Lorazepam	
Mannitol	

Paralysing agents

Analgesics

Sedatives

Anti-convulsant drugs

Respiratory drugs

Antibiotics

Inotropes

Diuretics

Cardiac drugs (include for heart failure, anti arrhythmias)

Other

Respiratory Factors

Due to the nature of PICU the majority of our patients will require some kind of respiratory adjunct during their stay with us. However, it is important to remember that a ventilator requirement may not be their primary need and may be secondary to their primary clinical condition or treatment requirement.

Signs of Respiratory Distress

- ↑ RR
- Cricoid tug
- Sternal/ intercostal/ subcostal recession
- Shoulder rolling
- Nasal flare
- Weak cry
- Stridor or wheeze
- Lethargy
- ↓ responsiveness/ Irritability
- ↓ consciousness
- Hypoxemia / Hypercobia

Late signs

- ◆ Bradycardia
- ◆ ↓ air movement
- ◆ Apnoea / Gaspings
- ◆ Poor systemic perfusion
- ◆ Head bobbing

When would you be very concerned about a child?

When there are 3 or more signs this child is likely to need close monitoring as they will not sustain an acceptable respiratory effect and often require CPAP/ intubating and ventilating.

Are there signs of potential respiratory distress even while ventilated?



The above picture shows the equipment needed for Intubation.
Where would this equipment be located on ward 2?
Can you name all the equipment in this picture?



The above picture shows a patient being intubated orally. You could research the procedure used for intubation and what things are done/assessed to ensure that intubation has been successful.

Types of Ventilation

On PICU we use a variety of ventilation settings and if you have spent time on any other HDU or ICU areas you may have some experience of these types of ventilation.

The most common ventilator you will find on ward 2 is an Evita 4. This is used for BIPAP and CPAP. We also use the flow driver and the NIPPV for longer term patients. HFOV is used for more critical patients.

While on PICU it would be worth doing some research into these different types of ventilation if you get the opportunity. Find out what the abbreviations mean and a small amount about how this works.

BIPAP: _____

CPAP: _____

HFOV: _____

NIPPV: _____

Flow Driver: _____



Name these 4 pieces of PICU equipment and see if you can see them in use on the unit.

1. _____
2. _____
3. _____
4. _____

Blood Gases

Terminology:

ABG - Arterial blood gas

VBG - Venous blood gas

CBG - Capillary blood gas

	ABG
PH	7.35 – 7.45
PCO₂	4.5 – 6
PO₂	10 – 14
HCO₃	22 – 26
BE	±2
SpO₂	96 – 100

There are no reference values for VBGs and CBGs. Both have lower pO₂ and are unreliable measurements, however they are good for monitoring the pCO₂. When measuring pCO₂ the reference values are the same as an ABG. Analysing blood gases allows you to see how well the respiratory system and metabolic systems are working. It shows the interaction between the lungs, blood and kidneys.

Guide to Interpreting Blood Gases:

- Look at pH to determine alkalosis or acidosis
- Look at pCO₂ to determine if it is a respiratory disorder
- Look at HCO₃⁻ and BE to determine if it is a metabolic disorder
- Remember they can have components of both. Is there a compensatory mechanism happening?

Now try and interpret the examples given below and list the common causes for these derangements.

Examples

1. pH 7.4
pCO₂ 5.8
pO₂ 12
HCO₃⁻ 24
BE +0.5

Description: _____

Causes: _____

2. pH 7.53
pCO₂ 3.2
pO₂ 11
HCO₃⁻ 24
BE +1

Description: _____

Cause: _____

3. pH 7.22
pCO₂ 5.3
pO₂ 12
HCO₃⁻ 14
BE -8

Description: _____

Cause: _____

4. pH 7.5
pCO₂ 5.5
PO₂ 14.9
HCO₃⁻ 32
BE +5

Description _____

Cause _____

No Looking.....
The answers can be found at the back of the booklet

Fluid Management

Fluid management is an essential part in a patients care. Calculating that your patient is receiving the correct amount of fluid is part of your daily safety checks. There are complete guidelines that can be found on the ward.

Normal maintenance fluid requirements apply as they would typical, however in some circumstances restrictions or additions may be a made.

Example

A child might be restricted to 80% fluid.
The child weights 8kg

Normal 100% allowance
 $8 \times 100 = 800\text{mls per 24hrs}$

80% restrictions
 $8 \times 80 = 640\text{mls per 24 hours}$

Now try this example
A child has a 90% restriction in place
The child weights 12kg

The Intravenous fluid of choice is currently 0.45% NaCl and 5% Dextrose however this does not apply to all patients. From the Fluid Management guidelines what fluid is recommended for Head Injury patients?

The PICU chart allows you to keep an accurate record of a patient fluid balance. You will be part of calculating the overall balance of your patient, changing your plan of care accordingly.

Some patients require additional fluid, three reasons are show below

Fluid Resuscitation for Shock

Bolus of 10-20ml/kg given, can be repeated if necessary. This is normally 0.9% NaCl, 4.5% Human Albumin Solution or commercial colloid ie Gelofusin.

Replacement of Pre-existing Fluid Losses

To calculate fluid deficit,

$$\text{Fluid deficit (ml)} = \text{weight (kg)} \times \% \text{ dehydration} \times 10$$

This fluid should be replaced over the next 24 hours

Replacement of Ongoing Fluid Losses.

Fluid losses should be replaced ml for ml, usually with 0.9% NaCl +/- KCL. If there is significant blood loss, packed cells may be used.

Example Patients on PICU

There is a vast diversity of patients on ward 2 due to the fact we are a regional PICU for Leeds and surrounding areas. We specialise in Respiratory and Neurology on ward 2 and act as regional cardiac centre, with a specialised cardiac PICU on ward 4.

It would be impossible to provide information on all the types of patients that we get through PICU, so we have selected 3 of the most common patients that we treat. All the information needed for this section can be found on the unit.

Head Injury

As Leeds is a regional Neurological Centre we receive a high proportion of traumatic head injury patients. All these patients go via our A&E department, even if they have been reviewed in a DGH A&E. This is to ensure that patients are checked thoroughly before being admitted to PICU, in case surgical intervention is required. Any additional scans should be done at this time.

We have PICU protocols available on the unit and they are printed off and put in the bed spaces of all these patients. We also have Bedside guides in the bed end trolleys for quick reference.

The essentials:

- Nurse patient on a hard, foam mattress with head up at 30 degrees.
- If the patient is paralysed the collar can be removed, but an Aspen collar **must** be in place prior to log rolling and moving.
- Maintenance fluid should be 0.9% NaCl, until blood sugar normalised.
- Use orogastric tube and oral intubation in case of base of skull fracture.
- Record 1hrly pupil reactions
- Aim to maintain ICP (if monitored) below 20. Consider additional sedation prior to handling.
- Maintain normothermia via oesophageal/rectal probe.

If you manage to be involved in the care of a patient being treated for a head injury try and find out as much as possible about the management.

Things to think about:

1. Why is C-Spine immobilisation so important?
2. Why is there a need to nurse these patients head up?
3. Why is maintaining a normal CO₂ and blood sugar so important?
4. What surgery may be used for patients with depressed skull fractures?
5. What is the importance of having a C-Spine both radiologically and clinically cleared?

Notes: _____

Seizures

Children are admitted to PICU following or during seizures for a number of reasons.

- Febrile Convulsions: Young children's thermoregulation is not as well advanced as older children and adults; they can sometimes suffer from convulsions when their body temperatures become too high. They often come to PICU if they have required high doses of medication to control the seizures, and this means they sometimes need to be ventilated for short periods of time.

Read about Febrile convulsions and think about the management these patients might need while on PICU.

- Following a brain Injury: Seizures are common in children following a head injury. These patients are normally ventilated due to their injury rather than as a direct response to their seizures. However, sometimes seizures cause apnoea, so ventilation is necessary.

Think about how Neuro Obs may differ in patients who are ventilated compared to those who are not.

- Known Epileptic Patients: Patients with known epilepsy come to PICU when their seizures become unmanageable or when they are in status epilepticus. They usually require high dose anti-convulsant medications which affect their respiratory function.

Find and read the unit protocol on management of acute seizures and status epilepticus.

Think about the factors which could trigger seizures in all of the above patients?

Think about the similarities between treating a patient with a head injury and a patient suffering with seizures?

Bronchiolitis

We have a high population of respiratory patients that are admitted to PICU. During the winter month's bronchiolitis is one of the most common reasons for children to be admitted.

Bronchiolitis is extremely common especially in the preterm babies and infants below 9 months of age. The airborne Respiratory Syncytial Virus (RSV) is often the main cause.

Symptoms often include the 'signs of respiratory distress' mentioned earlier in the booklet. Once the child is ventilated secretions can be a major factor in the child's condition. Clearing these secretions often require treatment from the physiotherapy team, taking the child off the ventilator and bagging them whilst using saline to help loosen these secretions. Being part of this process can be useful. Ask the Physios if you can accompany them on their ward rounds to see how these patients are treated.

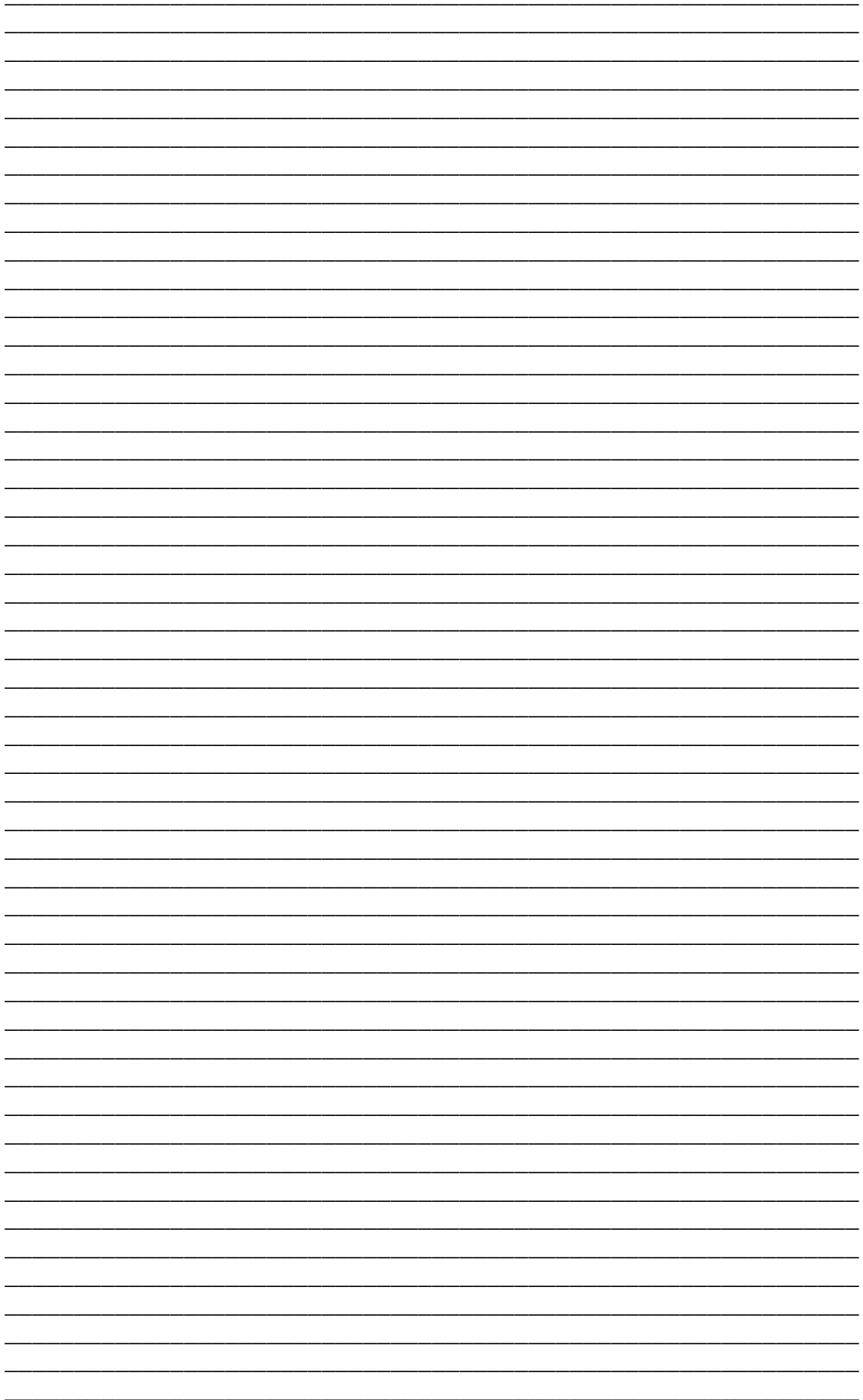
Bronchiolitis is often a distressing condition, the children are often sedated. Due to the age of these patients it is often necessary to sedate them for safety issues also. Name some of the most common sedatives used and their main side effects.

1 _____

2 _____

3 _____

Find the Parent Information booklet and read this for information. Is there anything else you need to know?



Evaluation Form

Please assist us in the ongoing improvement of our learning environment by taking the time to fill in this questionnaire. It will benefit future students on this placement.

On completion please could you put it in the pigeon hole for either *Jenny Gillies* or *Matthew Hick*, or hand it to your mentor if you prefer.

Information will be treated confidentially unless there are issues which you would personally like to raise in your evaluation.

What parts of the Welcome Pack did you find most helpful?

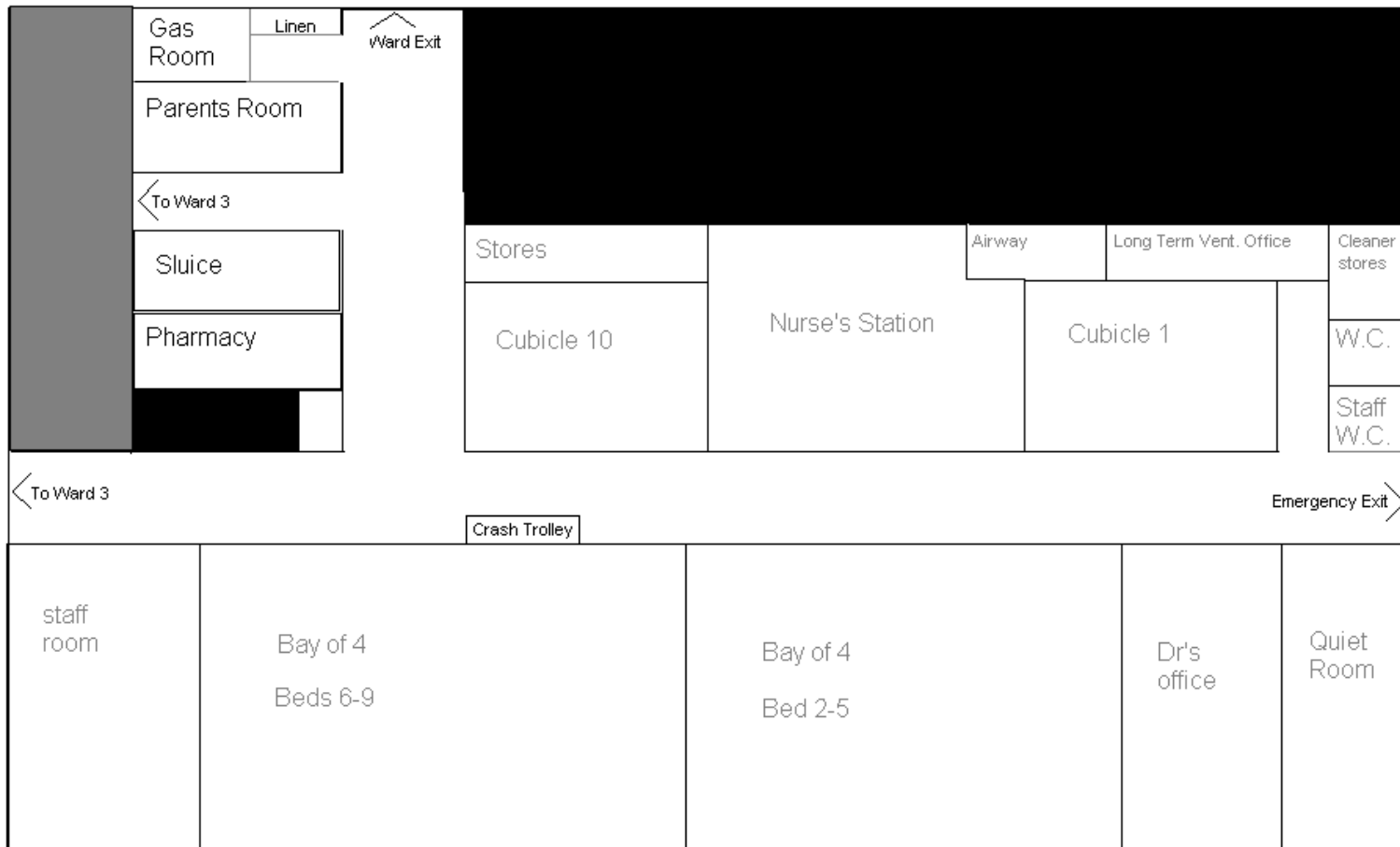
What areas do you think could be improved in the pack?

What did you enjoy about your placement?

What did you not enjoy about your placement?

Answers for blood gas questionnaire

1. Normal
2. Respiratory alkalosis secondary to hyperventilation.
Causes: anxiety, over mechanically ventilated. Neurological cause.
3. Metabolic acidosis
Causes: kidney failure, diabetic keto-acidosis
4. Metabolic alkalosis
Causes: Excessive vomiting, over dose diuretics.



This is a general overview of the ward layout for PICU, including all emergency exits and crash trolley.