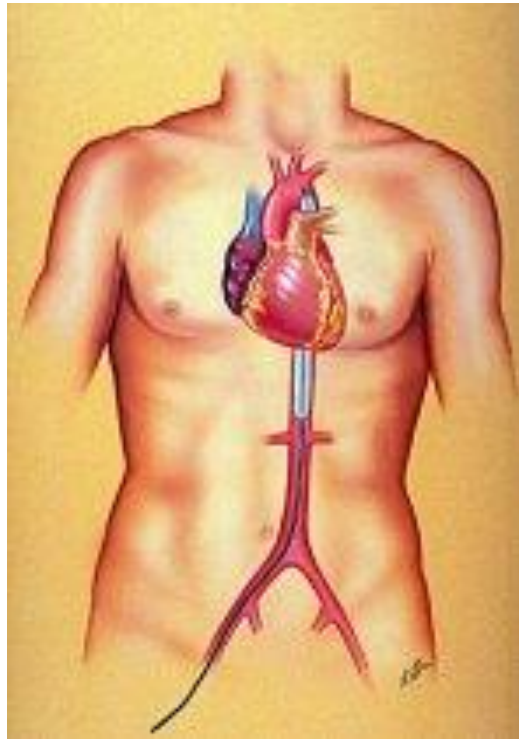


Appendix 3

***Competency Title: Caring for a patient with an Intra-aortic  
Balloon Pump (IABP)***

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**Trainee**

**Name:** .....

**Title:** .....

**Ward or department:** .....

**Clinical assessor**

**Name:** .....

**Title:** .....

**Method of assessment:** .....

## **Aims**

Following completion of this competency document the practitioner will be able to:

- Discuss the indications for an IABP therapy
- Demonstrate the ability to recognise optimal and suboptimal timing
- Be able to interpret and troubleshoot the console alarms
- Be able to recognise the early complication and take steps to minimize patient harm
- To develop the skills and knowledge to a level of competency that enables the practitioner to safely care for the patient with an IABP

## **Training methodology**

- 3 hour theoretical training session
- On line ELearning package
- Ward based training with the cardiac physiologists
- Support and training from the cardiac physiologists during the patients treatment

## Supervision Record

Please detail your clinical supervision activity.

<b>Date</b>	<b>Activity</b>	<b>Suggested learning activities</b>	<b>Clinical assessors signature</b>

**Skill criteria**

No errors observed	5
Occasional errors, corrected by trainee	4
Frequent errors, corrected by trainee	3
Frequent errors, not corrected by trainee	2
Trainee unable to proceed without instruction/prompting	1

**Knowledge criteria**

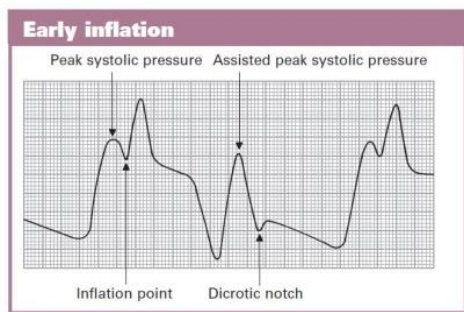
Evaluation: <i>articulates response, what, when how and why</i>	5
Synthesis: <i>articulates the connections between the parts</i>	4
Analysis: <i>able to examine how parts relate to the whole</i>	3
Application: <i>can relate facts to another situation</i>	2
Knowledge and understanding: <i>provides examples and distinguishes differences between examples</i>	1

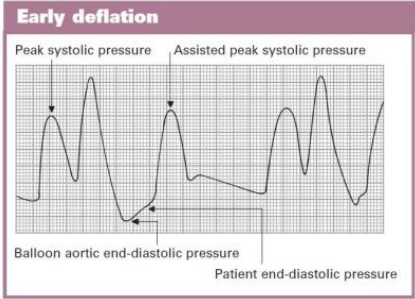
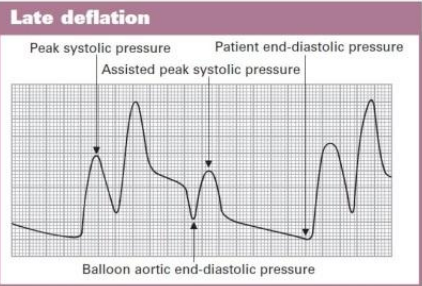
S= skill (minimum level 4)

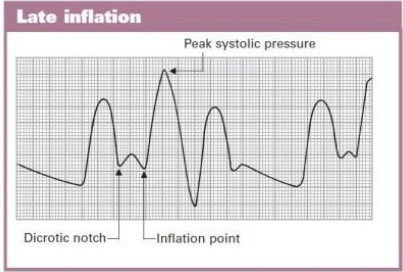
K= knowledge (minimum level indicated in box \*)

Observable criteria	Minimum level	Tick level of achievement					Assessment Outcome		Assessors Signature and Date
		1	2	3	4	5	Pass ✓	Fail ✓	
	* State required level i.e. S4, K5								
<b>Cardiac physiology</b>									
1. Describe the cardiac cycle	K1								
2. Define the term preload and explore how it can be decreased and increased	K2								
3. Define the term afterload and explore how it can be decreased and increased	K2								
4. Discuss the anatomy and physiology of coronary artery perfusion	K2								
<b>IABP insertion</b>									
5. State four reasons for the insertion of an IABP	K1								
6. State 4 contraindications for the insertion of an IABP	K1								

Observable criteria	Minimum level	Tick level of achievement					Assessment Outcome		Assessors Signature and Date
		1	2	3	4	5	Pass ✓	Fail ✓	
	* State required level i.e. S4, K5								
7. Explore the term counter pulsation	K3								
8. With reference to the cardiac cycle discuss the physiological effects of the therapy	K2								
9. State nine complications associated with line placement and explore ways to minimize the occurrence	K4								
<b>Interpreting the IABP waveform</b>									
10. Define the term augmentation	K2								
11. Discuss why timing is important	K3								
12. Evaluate the physiological effects of the trace and describe the actions	K4								



Observable criteria	Minimum level	Tick level of achievement					Assessment Outcome		Assessors Signature and Date
	* State required level i.e. S4, K5	1	2	3	4	5	Pass ✓	Fail ✓	
<p>13. Evaluate the physiological effects of the trace and describe the actions</p>  <p>The 'Early deflation' trace shows two pressure waveforms. The top waveform is 'Balloon aortic end-diastolic pressure' and the bottom is 'Patient end-diastolic pressure'. Both show a similar pattern of systolic peaks and diastolic troughs. The 'Assisted peak systolic pressure' is indicated by a vertical line between the two peaks, showing they are nearly equal. The 'Peak systolic pressure' is also indicated, showing the balloon pressure is slightly higher than the patient's.</p>	K4								
<p>14. Evaluate the physiological effects of the trace and describe the actions</p>  <p>The 'Late deflation' trace shows two pressure waveforms. The top waveform is 'Balloon aortic end-diastolic pressure' and the bottom is 'Patient end-diastolic pressure'. The balloon pressure trace shows a significantly lower diastolic pressure compared to the patient's trace, indicating late deflation. The 'Assisted peak systolic pressure' is indicated by a vertical line, showing it is lower than the patient's peak systolic pressure.</p>	K4								

Observable criteria	Minimum level	Tick level of achievement					Assessment Outcome		Assessors Signature and Date
		1	2	3	4	5	Pass ✓	Fail ✓	
	* State required level i.e. S4, K5								
15. Evaluate the physiological effects of the trace and describe the actions  	K4								
<b>Troubleshooting the IABP pump</b>									
16. The “IAB disconnection” alarm is triggered, explore the causes and immediate actions	K4								
17. The “rapid gas loss” alarm is triggered, explore the causes and immediate actions	K4								
18. The “check IABP catheter” alarm is triggered, explore the causes and immediate actions	K4								
19. The “low helium” alarm is triggered, explore the causes and immediate actions	K4								

Observable criteria	Minimum level	Tick level of achievement					Assessment Outcome		Assessors Signature and Date
		1	2	3	4	5	Pass ✓	Fail ✓	
	* State required level i.e. S4, K5								
20. The “low battery” alarm is triggered, explore the causes and immediate actions	K4								
21. The “IAB failure” alarm is triggered, explore the causes and immediate actions	K4								
22. The “augmentation below limit set” alarm is triggered, explore the causes and immediate actions	K4								
23. The “prolonged time in standby” alarm is triggered, explore the causes and immediate actions	K4								
24. The “leak in IAB circuit” alarm is triggered, explore the causes and immediate actions	K4								
<b>Nursing care</b>									
25. Describe the process for checking a bed space, setting parameters and giving a safe handover	K3								
26. Discuss the patients cardiovascular nursing care needs	K3								
27. Discuss the patients respiratory nursing care needs	K3								
28. Discuss the patients renal care needs	K3								



Observable criteria	Minimum level	Tick level of achievement					Assessment Outcome		Assessors Signature and Date
		1	2	3	4	5	Pass ✓	Fail ✓	
	* State required level i.e. S4, K5								
29. Discuss the patients gastrointestinal care needs	K3								
30. Discuss the patients integumentary care needs	K3								
31. Discuss the patients psychological and educational care needs	K3								
32. Discuss how you would reduce the incidence of line infection	K3								
33. Discuss the actions to be taken in the event of a cardiac arrest	K3								
34. Discuss the observations required following IABP removal	K3								
35. Discuss the impact on the patient and family if the treatment is withdrawn	K3								
36. Discuss the impact on the staff if the treatment is withdrawn	K3								

## Competency Statement

### Practitioner's signature and date:

I am competent in this procedure at this time and understand the standard statement, action and outcome. Having received appropriate training, I accept full responsibility for the maintenance my own competence and have discussed this role as part of my job description with the person to whom I am managerially accountable.

Signature:

Date:

Printed name:

Date:

### Clinical Assessor's signature and date:

I confirm that the above practitioner has achieved the required competency level and is now able to work autonomously in an unsupervised capacity.

Signature:

Date:

Printed name:

Date:

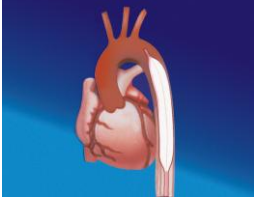
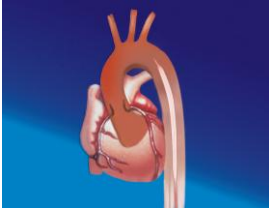
Job role:

Please place one copy of this record in your professional portfolio and give a second copy to your line manager

## Assessors Guidelines

Assessment Criteria	Required knowledge and/or skill
<b><i>Cardiac physiology</i></b>	
<p>1. Describe the cardiac cycle</p>	<p>The cardiac cycle has two phases - diastole and systole.</p> <p><b>Diastole</b> During this phase the ventricles are relaxed and blood is passively flowing from both atria into the ventricles. At the end of diastole and just before ventricular systole, both atria contract. Contraction of the atria means that an additional 25% of blood into the ventricles (atrial kick).</p> <p><b>Systole</b> During this phase the ventricles contract to eject blood into the aorta and pulmonary artery. The aortic and pulmonic valves open to permit ejection into the aorta and pulmonary artery and the mitral and tricuspid valves are closed.</p>
<p>2. Define the term preload and explore how it can be decreased and increased</p>	<ul style="list-style-type: none"> <li>• This is determined by the amount of blood remaining in the left ventricle at the end of diastole (ventricular filling pressure)</li> <li>• Preload can be increased by giving crystalloid, colloid or blood. Other causes include fluid overload, venous congestion, hypothermia and ventricular failure</li> <li>• Preload can be decreased by volume loss, venous dilation (for example from GTN), tachycardia or raised intra-thoracic pressure</li> </ul>
<p>3. Define the term afterload and explore how it can be decreased and increased</p>	<ul style="list-style-type: none"> <li>• The amount of pressure the left ventricle must work against to pump blood into the systemic circulation. Afterload is influenced by             <ul style="list-style-type: none"> <li>○ Ventricular chamber size</li> <li>○ Wall thickness, radius and pressure</li> <li>○ Intra cavity pressure</li> <li>○ Aortic impedance</li> <li>○ Negative intra-thoracic pressure</li> <li>○ Systemic vascular resistance</li> </ul> </li> </ul>

Assessment Criteria	Required knowledge and/or skill
	<ul style="list-style-type: none"> <li>○ Hypertension and aortic valve disease</li> <li>● Afterload is increased in hypertension, hypothermia, stress, anxiety, cardiogenic and hypovolaemic shock</li> <li>● Afterload is decreased in transfusion reactions, anaphylactic shock, septic shock and drugs that cause vasodilation i.e. ACEI</li> </ul>
4. Discuss the anatomy and physiology of coronary artery perfusion	<p>The coronary circulation comprises of:</p> <ul style="list-style-type: none"> <li>● The left main coronary artery that divides into left anterior descending and circumflex branches and the right main coronary artery.</li> <li>● The openings to the arteries originate at the base of the aorta from openings called the coronary ostia. These are located behind the aortic valve leaflets</li> <li>● The cardiac veins drain into the <b>coronary sinus</b> located on the posterior surface of the heart. This drains into the right atrium.</li> <li>● Contraction of the ventricle and opening of the aortic valves partially occlude the ostium. 80% of coronary artery oxygenation therefore occurs during the diastolic phase of the cardiac cycle</li> </ul>
<b><i>IABP insertion</i></b>	
5. State four reasons for the insertion of an IABP	<ul style="list-style-type: none"> <li>● Haemodynamic support during and after Percutaneous Coronary Intervention (PCI)</li> <li>● Unstable angina</li> <li>● Cardiogenic shock</li> <li>● Pre operatively in high risk patients</li> <li>● Mechanical complications post myocardial infarction</li> </ul>
6. State 4 contraindications for the insertion of an IABP	<ul style="list-style-type: none"> <li>● Severe aortic regurgitation</li> <li>● Abdominal or aortic aneurysm</li> <li>● Aortic dissection</li> <li>● Severe calcific aorta-iliac disease</li> </ul>

Assessment Criteria	Required knowledge and/or skill
	<ul style="list-style-type: none"> <li>• Severe peripheral vascular disease</li> <li>• Previous fem-pop bypass</li> </ul>
<p>7. Explore the term counter pulsation</p>	<p>Inflation of IABP occurs just after the closure of the aortic valve causing an increase in diastolic arterial pressure and an increase in cardiac output.</p>  <p><i>Balloon inflation</i> (source <a href="http://ca.maquet.com">http://ca.maquet.com</a>)</p> <p>Deflation of the IABP occurs in systole causing a decrease in aortic end diastolic pressure, ventricle wall tension and increase in stroke volume.</p>  <p><i>Balloon deflation</i> (source <a href="http://ca.maquet.com">http://ca.maquet.com</a>)</p>
<p>8. With reference to the cardiac cycle discuss the physiological effects of the therapy</p>	<ul style="list-style-type: none"> <li>• Increases coronary artery perfusion</li> <li>• Increases myocardial oxygen supply</li> <li>• Decreases myocardial oxygen demand</li> <li>• Decreases myocardial work by reducing afterload</li> <li>• Increases blood pressure</li> <li>• Decreases pulmonary artery pressure</li> </ul>

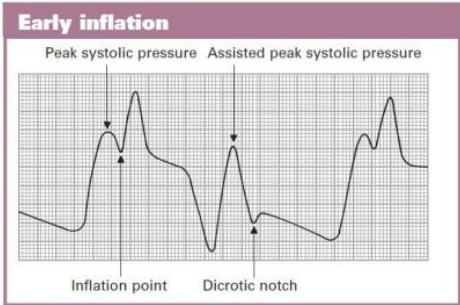
Assessment Criteria	Required knowledge and/or skill
<p>9. State nine complications associated with line placement and explore ways to minimize the occurrence</p>	<p style="text-align: center;"><b>Limb ischaemia</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• Femoral artery obstruction</li> <li>• Thrombus formation</li> <li>• Balloon migration up the aortic arch reducing blood supply to the left arm</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Ensure patient understands the rationale for not moving without nursing assistance</li> <li>• Support the balloon pump tubing when moving the patient</li> <li>• Follow the Trust anticoagulation policy</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Document hourly pedal pulses</li> <li>• Document hourly radial pulses</li> <li>• Document limb temperature</li> <li>• Document limb colour</li> </ul> <p style="text-align: center;"><b>Bleeding from insertion site</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• Secondary to coagulopathy</li> <li>• Secondary to vessel damage during insertion</li> <li>• Secondary to patient movement</li> <li>• Retro-peritoneal bleeding</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Follow the Trust anticoagulation policy</li> <li>• Minimise catheter movement</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Keep site exposed whilst maintaining patient dignity</li> <li>• Observe the insertion site anteriorly</li> <li>• Observe for bleeding posteriorly</li> <li>• Observe posteriorly for bruising to the flanks (Grey Turner's sign)</li> </ul>

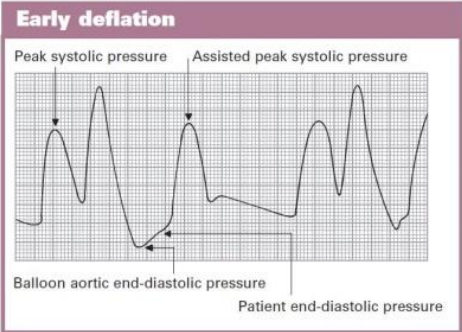
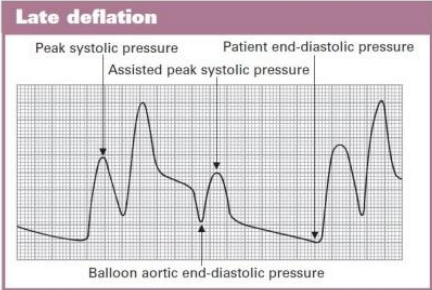
Assessment Criteria	Required knowledge and/or skill
	<ul style="list-style-type: none"> <li>• Prevent catheter movement</li> <li>• Hourly observations to detect the early signs of bleeding</li> </ul> <p style="text-align: center;"><b>Thromboembolism</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• Caused by the presence of the balloon</li> <li>• Higher risk if there is a lower inflation ratio or if pump stops</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Immediately respond to alarms to prevent balloon stasis</li> <li>• Follow the Trust anticoagulation policy</li> <li>• Minimise catheter movement</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Anticoagulation as per hospital policy</li> <li>• Check clotting studies as per hospital policy</li> </ul> <p style="text-align: center;"><b>Thrombocytopenia</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• Mechanical damage to platelets</li> <li>• Anticoagulation therapy</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Follow the Trust anticoagulation policy</li> <li>• Minimise catheter movement</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Observe patient for bruising, oozing and/or bleeding</li> <li>• Monitor platelet count</li> <li>• Replace where indicated</li> </ul> <p style="text-align: center;"><b>Balloon catheter rupture and gas loss</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• Contact with sharp object</li> <li>• Balloon membrane fatigue</li> </ul>

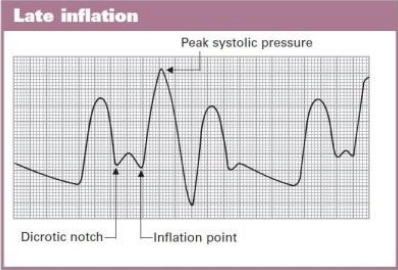
Assessment Criteria	Required knowledge and/or skill
	<p>Contact with a calcified plaque</p> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Early detection required</li> <li>• Minimise catheter movement</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Observe for backflow of blood into the tubing</li> <li>• Immediately respond to console alarms “gas leak”, “low augmentation” or “blood detect</li> </ul> <p style="text-align: center;"><b>Aortic dissection</b></p> <p><b>Causes</b> Increased risk in patients with a friable aorta i.e. Marfan’s disease</p> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Early detection required</li> </ul> <p><b>Observation</b> Observe patient for the following signs and symptoms:</p> <ul style="list-style-type: none"> <li>• Back pain</li> <li>• Abdominal pain</li> <li>• Cardiovascular instability</li> </ul> <p style="text-align: center;"><b>Compartment syndrome</b></p> <p><b>Causes</b> Temporary or partial limb ischaemia caused by occlusion or thrombus</p> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Ensure patient understands the rationale for not moving without nursing assistance</li> <li>• Support the balloon pump tubing when moving the patient</li> <li>• Follow the Trust anticoagulation policy</li> </ul> <p><b>Observation</b> Observe limb for</p> <ul style="list-style-type: none"> <li>• Swelling</li> </ul>



Assessment Criteria	Required knowledge and/or skill
	<ul style="list-style-type: none"> <li>• Loss of sensation and/or function</li> <li>• Pain</li> <li>• Measure and record calf girth</li> </ul> <p style="text-align: center;"><b>Line sepsis</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• During insertion procedure secondary to a failure to maintain site asepsis</li> <li>• Following insertion secondary to a failure to maintain site asepsis</li> <li>• Secondary to site contamination from incontinence</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Aseptic technique for all line interventions</li> <li>• Use semi-occlusive transparent dressings and change when soiled</li> <li>• Consider bowel management system if the patient has diarrhoea</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Hourly observations</li> <li>• Check septic markers daily</li> <li>• Check and record VIP score daily</li> </ul> <p style="text-align: center;"><b>Renal Failure</b></p> <p><b>Causes</b></p> <ul style="list-style-type: none"> <li>• Decreased urine output after the insertion of IABP can occur if the balloon moves distally occluding the renal arteries and reducing renal perfusion</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>• Ensure patient understands the rationale for not moving without nursing assistance</li> <li>• Support the balloon pump tubing when moving the patient</li> </ul> <p><b>Observation</b></p> <ul style="list-style-type: none"> <li>• Catheterise</li> </ul>

Assessment Criteria	Required knowledge and/or skill
	<ul style="list-style-type: none"> <li>• Hourly urine output</li> <li>• Check renal function</li> </ul>
<b>Interpreting the IABP waveform</b>	
10. Define the term augmentation	The ability of the balloon to fully expand and contain the full amount of helium for the catheter. During normal pumping this is maintained on full to prevent blood clots forming. Because augmentation occurs during the diastolic part of the cycle coronary artery blood flow is enhanced.
11. Discuss why timing is important	To maximize the physiological effects of the therapy and prevent complications
12. Analyse the waveform and evaluate the physiological effects of the trace and describe the actions  	<p><b>Waveform analysis</b> The balloon inflates during systole and when the aortic valve is closed i.e. before the dicrotic notch</p> <p><b>Physiological impact</b></p> <ul style="list-style-type: none"> <li>• Increases myocardial workload</li> <li>• Decreases stroke volume</li> <li>• Decreases cardiac output</li> </ul> <p><b>Actions</b> Contact the Cardiac Physiologist on Ext 4258 between 08.00 and 5.15pm or via switch board out of those hours</p>
13. Analyse the waveform and evaluate the physiological effects of the trace and describe	<p><b>Waveform analysis</b> With early deflation, a U shape appears and peak systolic pressure is less than or equal to assisted peak systolic pressure.</p>

Assessment Criteria	Required knowledge and/or skill
<p>the actions</p>  <p>The graph titled 'Early deflation' shows two pressure traces on a grid. The top trace is 'Peak systolic pressure' and the bottom trace is 'Assisted peak systolic pressure'. The 'Peak systolic pressure' trace shows a normal systolic peak. The 'Assisted peak systolic pressure' trace shows a lower systolic peak. The 'Balloon aortic end-diastolic pressure' trace shows a diastolic pressure that is lower than the 'Patient end-diastolic pressure' trace.</p>	<p><b>Physiological impact</b></p> <ul style="list-style-type: none"> <li>• Decreased coronary artery perfusion</li> <li>• Decreased afterload reduction</li> </ul> <p><b>Actions</b> Contact the Cardiac Physiologist on Ext 4258 between 08.00 and 5.15pm or via switch board out of those hours</p>
<p>14. Analyse the waveform and evaluate the physiological effects of the trace and describe the actions</p>  <p>The graph titled 'Late deflation' shows two pressure traces on a grid. The top trace is 'Peak systolic pressure' and the bottom trace is 'Assisted peak systolic pressure'. The 'Peak systolic pressure' trace shows a normal systolic peak. The 'Assisted peak systolic pressure' trace shows a lower systolic peak. The 'Balloon aortic end-diastolic pressure' trace shows a diastolic pressure that is lower than the 'Patient end-diastolic pressure' trace.</p>	<p><b>Waveform analysis</b> The balloon inflates after the closed aortic valve. The aortic valve closure precedes the inflation point.</p> <p><b>Physiological impact</b></p> <ul style="list-style-type: none"> <li>• Reduction in coronary artery perfusion pressure</li> </ul> <p><b>Actions</b> Contact the Cardiac Physiologist on Ext 4258 between 08.00 and 5.15pm or via switch board out of those hours</p>
<p>15. Analyse the waveform and evaluate the physiological effects of the trace and describe</p>	<p><b>Waveform analysis</b> The balloon has been inflated too long or inflates at the beginning of ventricular ejection. The left ventricle has to eject blood against the</p>

Assessment Criteria	Required knowledge and/or skill
<p>the actions</p> 	<p>resistance of the inflated balloon.</p> <p><b>Physiological impact</b></p> <ul style="list-style-type: none"> <li>• Increases afterload</li> <li>• Increases myocardial oxygen consumption</li> <li>• Increases cardiac workload</li> <li>• Increases preload</li> </ul> <p><b>Actions</b></p> <p>Contact the Cardiac Physiologist on Ext 4258 between 08.00 and 5.15pm or via switch board out of those hours</p>
<b><i>Troubleshooting the IABP pump</i></b>	
<p>16. The “IAB disconnection” alarm is triggered, explore the causes and immediate actions</p>	<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• Extension tubing has become disconnected</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Reconnect the extension tubing. Press IABP fill for 3 seconds then press assist/standby to start pumping</li> </ul>
<p>17. The “rapid gas loss” alarm is triggered, explore the causes and immediate actions</p>	<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• Leak, kink or hole in the tubing</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Check the patients leg is not bent up, check all connections and check tubing, if flecks of blood appear in the tubing the IABP may have ruptured- stop pumping and inform cardiologist immediately</li> </ul>
<p>18. The “check IABP catheter” alarm is triggered, explore the causes and immediate actions</p>	<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>• Means the catheter is kinked</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>• Check the markings on the sheath to ensure that the catheter has not</li> </ul>

Assessment Criteria	Required knowledge and/or skill
	migrated <ul style="list-style-type: none"> <li>• Examine catheter for signs of kinks and ensure patients leg is kept straight</li> <li>• Seek advice to exclude folded membrane</li> </ul>
19. The “low helium” alarm is triggered, explore the causes and immediate actions	<b>Cause</b> <ul style="list-style-type: none"> <li>• Helium level slow</li> </ul> <b>Actions</b> <ul style="list-style-type: none"> <li>• Inform cardiac technician to change helium tank</li> </ul>
20. The “low battery” alarm is triggered, explore the causes and immediate actions	<b>Cause</b> <ul style="list-style-type: none"> <li>• Not plugged into the main supply</li> </ul> <b>Actions</b> <ul style="list-style-type: none"> <li>• Plug into wall socket</li> </ul>
21. The “IAB failure” alarm is triggered, explore the causes and immediate actions	<b>Cause</b> <ul style="list-style-type: none"> <li>• IABP console fails to function as a result of technical malfunction or presence of blood in the condenser</li> </ul> <b>Action</b> <ul style="list-style-type: none"> <li>• Contact cardiologist and technician immediately</li> </ul>
22. The “augmentation below limit set” alarm is triggered, explore the causes and immediate actions	<b>Cause</b> <ul style="list-style-type: none"> <li>• Augmentation outside of set parameters</li> </ul> <b>Actions</b> <ul style="list-style-type: none"> <li>• Check patients vital signs</li> <li>• Review alarm parameters</li> <li>• Check the transducer is in line with the patient.</li> <li>• Contact cardiologist</li> </ul>
23. The “prolonged time in standby” alarm is	<b>Actions</b>

Assessment Criteria	Required knowledge and/or skill
triggered, explore the causes and immediate actions	<ul style="list-style-type: none"> <li>Do not recommence intra-aortic balloon pumping if the balloon has been stopped for 20 minutes.</li> <li>Contact the cardiologist immediately</li> </ul>
24. The “leak in IAB circuit” alarm is triggered, explore the causes and immediate actions	<p><b>Cause</b></p> <ul style="list-style-type: none"> <li>Loose connection, high rate of helium diffusion from the balloon or ruptured balloon</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>Check connections.</li> <li>If blood is evident in the line stop the pump and contact the cardiologist immediately.</li> </ul>
<b><i>Nursing care</i></b>	
25. Describe the process for checking a bed space, setting parameters and giving a safe handover	<p><b>Prior to the patients arrival</b></p> <ul style="list-style-type: none"> <li>Check that monitoring equipment, oxygen and suction are in good working order</li> </ul> <p><b>On arrival</b></p> <ul style="list-style-type: none"> <li>Receive handover from the cardiac catheterisation lab nurse detailing the procedure</li> <li>Assess patient by evaluating pain score, cardiovascular observations, checking the entry site, pedal and radial pulses</li> <li>Check that all of the lines are secure and labelled correctly</li> <li>Set the monitor alarms to the patients parameters</li> <li>Check IABP settings and parameters ensuring that all pumps are plugged in</li> <li>Discuss any drug that has been given or to be given</li> <li>Confirm any bloods taken or to be taken</li> </ul>
26. Discuss the patients cardiovascular nursing care needs and explore the rationale	<p><b>Action</b></p> <ul style="list-style-type: none"> <li>Monitor temperature, pulse, systolic, diastolic and mean arterial blood</li> </ul>

Assessment Criteria	Required knowledge and/or skill
	<p>pressure hourly</p> <ul style="list-style-type: none"> <li>• Monitor EWSS hourly</li> <li>• Monitor patient level of consciousness using AVPU</li> <li>• Observe and record the IABP waveform</li> <li>• Ensure ECG leads are secure</li> <li>• Monitor and treat arrhythmia's</li> <li>• Maintain therapeutic anticoagulation</li> <li>• Monitor radial and pedal pulses hourly</li> </ul> <p><b>Rationale</b></p> <ul style="list-style-type: none"> <li>• CVS observations and waveform analysis is carried out to monitor the effectiveness of treatment and identify complications such as bleeding</li> <li>• Radial pulses are checked because if the balloon moves upwards, the patient may lose perfusion to the left arm, because the left subclavian artery will be occluded.</li> <li>• The patient's level of consciousness is monitored because if the balloon moves upwards it may occlude cerebral blood supply. Also inadequate anticoagulation or pump cessation may cause arterial emboli to form and cause a stroke</li> </ul>
<p>27. Discuss the patients respiratory nursing care needs and explore the rationale</p>	<p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Monitor respiratory rate and pulse oximetry hourly</li> <li>• Provide supplementary oxygen as required</li> <li>• Encourage deep breathing exercises</li> </ul> <p><b>Rationale</b></p> <ul style="list-style-type: none"> <li>• Prolonged bed rest increased the risk of developing a hospital acquired pneumonia</li> </ul>

Assessment Criteria	Required knowledge and/or skill
<p>28. Discuss the patients renal care needs and explore the rationale</p>	<p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Catheterise and monitor urine output hourly</li> <li>• Monitor fluid balance</li> <li>• Monitor renal function daily</li> </ul> <p><b>Rationale</b></p> <ul style="list-style-type: none"> <li>• If the balloon is too low, the renal arteries can be occluded – urine output will fall dramatically, and the patient will be at risk for kidney injury</li> </ul>
<p>29. Discuss the patients gastrointestinal care needs and explore the rationale</p>	<p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Assist and monitor patients dietary and food intake</li> <li>• Consider a food and fluid chart to monitor intake</li> <li>• Use of nutritional supplements if required</li> <li>• Refer to dietician as needed</li> <li>• Monitor bowels and give laxatives as required</li> <li>• Consider gut protection</li> </ul> <p><b>Rationale</b></p> <ul style="list-style-type: none"> <li>• To prevent malnutrition</li> <li>• To prevent gastric ulceration</li> </ul>
<p>30. Discuss the patients integumentary care needs and explore the rationale</p>	<p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Educate the patient about the need to be elevated no more than 30 degrees and to keep the affected leg straight</li> <li>• Observe pressure areas</li> <li>• Use the SKIN bundle and turn patient every 2- 4 hours. Use a minimum of three members of staff to ensure that the balloon is not moved</li> <li>• Ensure that the insertion site is visible whilst maintaining patient dignity</li> </ul>



Assessment Criteria	Required knowledge and/or skill
	<ul style="list-style-type: none"> <li>• Check IABP entry site hourly and observe for bleeding and /or haematoma formation. Remember also to check behind the patients buttocks as blood flow may be retrograde.</li> <li>• Check flanks for any signs of bruising</li> <li>• Monitor limb perfusion hourly</li> </ul> <p><b>Rationale</b></p> <ul style="list-style-type: none"> <li>• Limitation to patient positioning will reduce the likelihood that the IABP line will migrate inwards, and upwards.</li> <li>• Bed rest and movement limitation increased the risk of developing pressure ulcers</li> <li>• The presence of the balloon in the aorta will damage the platelets causing a thrombocytopenia. In addition the patient will be anticoagulated. Both these factors increase the risk of bleeding from the site</li> <li>• The femoral artery may become damaged causing internal bleeding. Bruising in the flanks (Grey Turners sign) is a sign of retroperitoneal bleeding.</li> </ul>
<p>31. Discuss the patients psychological and educational care needs and explore the rationale</p>	<p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Fully inform patient and family about what is happening</li> <li>• Keep noise levels to a minimum</li> <li>• Cluster care to allow for periods of uninterrupted sleep</li> <li>• Monitor pain score hourly and ensure adequate pain control</li> <li>• Educate the patient about the need to avoid sitting up more than 30 degrees</li> <li>• Educate the patient about the need to keep the affected leg straight</li> </ul> <p><b>Rationale</b></p> <ul style="list-style-type: none"> <li>• To ensure informed consent and treatment compliance</li> <li>• To support the patient at a stressful time</li> </ul>

Assessment Criteria	Required knowledge and/or skill
32. Discuss how you would reduce the incidence of line infection	<ul style="list-style-type: none"> <li>• Aseptic technique for all line interventions</li> <li>• Check and record VIP score daily</li> <li>• Use semi-occlusive transparent dressings and change when soiled</li> <li>• Consider bowel management system if the patient has diarrhoea</li> </ul>
33. Discuss the actions to be taken in the event of a cardiac arrest	<ul style="list-style-type: none"> <li>• The IABP can be left in mode of ECG or pressure as it will synchronise to the rate and rhythm of chest compressions</li> <li>• If put into standby mode can be left in this mode for NO MORE than 20 minutes</li> <li>• The IABP is completely isolated from the patient and is safe to defibrillate</li> </ul>
34. Discuss the observations required following IABP removal	<ul style="list-style-type: none"> <li>• Patient should remain lying flat for 4 hours following removal of catheter</li> <li>• The patient should not flex the hip greater than 30 degrees for 24 hours</li> <li>• Circulation observations to both legs to be done every 30 minutes for 1 hour, hourly for 4 hours then 2 hourly for 24 hours</li> <li>• Cardiovascular observations to be done every 15 minutes for 1 hour, hourly for 4 hours then 2 hourly for 24 hours</li> </ul>
35. Discuss the impact on the patient and family if the treatment is withdrawn	<p><b>Patient</b> The medical and nursing team where appropriate should ensure that:</p> <ul style="list-style-type: none"> <li>• The patient understands the underlying condition and treatment options</li> <li>• The patient is informed of the prognosis</li> <li>• The patient understands any alternative options to treatment withdrawal</li> <li>• The patient understands what will happen following withdrawal</li> </ul>

Assessment Criteria	Required knowledge and/or skill
	<p><b>Family and friends</b></p> <ul style="list-style-type: none"> <li>• Can be traumatic for patient and family as the treatment is not working and withdrawal of treatment, be there to support patient and family and ensure they are fully involved and updated in decisions</li> <li>• Explain to the family that end of life care for the patient will focus on managing pain and other distressing symptoms, providing psychological, social and spiritual support as required</li> <li>• Ensure they understand that death may occur rapidly after treatment withdrawal</li> </ul>
<p>36. Discuss the impact on the staff if the treatment is withdrawn</p>	<ul style="list-style-type: none"> <li>• Patient deterioration and death may be rapid following withdrawal of treatment and the action will be viewed as a cause and effect.</li> <li>• Although it is a team decision, the member of staff responsible for terminating the therapy can experience emotions of guilt.</li> <li>• The family and friends may be present at the time of and therefore exhibit sudden rises in stress and anxiety.</li> <li>• The team will need also need to support the patient who may start to experience more chest pain following withdrawal of the IABP</li> <li>• Members of the health care team who participated in the experience should be given an opportunity to discuss their responses to the patient's death. This can be achieved by facilitating formal debriefing session several days after the event.</li> <li>• Debriefing will allow members of the health care team to get a sense of closure regarding the event. It may also offer learning opportunities.</li> </ul>