

## **UCLH ICU PRACTICE GUIDELINES**

### **ARTERIAL LINES**

#### **Set up, care of and blood sampling from arterial lines**

**Reviewed June 2006 E Morton**

### **ARTERIAL LINE INSERTION**

#### **INDICATIONS**

- To obtain uncontaminated samples of arterial blood from an indwelling arterial cannula for accurate analysis and assessment of patient blood gases, respiratory and acid-base status or other haematological investigations, with as little discomfort to the patient as possible.
- To provide accurate and continuous haemodynamic data regarding patients' status - especially during the administration of any drugs which may have a vasoactive effect or when there may be a risk of arrhythmia or during a period of haemodynamic instability.

#### **OBSERVATIONS PRIOR TO INSERTION**

- The vessel used should be large enough to measure pressure accurately without the catheter occluding the artery or causing thrombosis.
- The artery used should have adequate collateral circulation should occlusion occur.
- The site should be easily accessible for nursing care.
- The site used should be an area not prone to contamination. The radial artery is most often used and is easily observed therefore any potential complications should be prevented.

#### **EQUIPMENT CHECKLIST**

- 500mls Sodium Chloride 0.9%.
- Sterile field for insertion using ANTT.
- Sterile dressing eg.IV3000.
- Closed circuit flush kit with sampling port.
- Pressure transducer.
- Pressure bag.
- Date and time label for flush kit.

## PROCEDURE

ACTION	RATIONALE
Wash hands.	To reduce the risk of cross infection.
Explain the procedure to the patient.	To ensure that the patient understands & to alleviate anxiety
Prepare equipment for insertion using ANTT.	To reduce the risk of contamination
Perform procedure using ANTT	To reduce the risk of contamination
Ensure flush kit is primed and labelled & transducer attached.	To avoid infusing air into the patient and to observe waveform.
When cannula is in situ, using ANTT attach flush kit & transducer system.	To allow flushing of cannula & to observe waveform and pressure.
Using ANTT dress the cannula site with sterile dressing	To secure the cannula & prevent contamination.
Zero transducer and check the monitor pressure against the cuff pressure.	To ensure accuracy of readings

## OBTAINING AN ARTERIAL BLOOD SAMPLE

### EQUIPMENT

- ANTT tray
- One 2ml pre-heparinised syringe (for ABG's only)
- Sterile red bung
- Protective goggles.
- Blood sampling requests (except for ABG)
- Blood sampling containers (for haematology, biochemistry etc. requests)
- Single use Vacutainer holder (for haematology, biochemistry etc. requests)

## PROCEDURE

ACTION	RATIONALE
Wash hands.	To reduce the risk of cross infection.
Explain the procedure to the patient.	To ensure that the patient understands & to alleviate anxiety
Prepare equipment for sampling using ANTT.	To reduce the risk of contamination
Confirm patient identity using name band	To confirm correct patient identity.
Don goggles	To prevent splash injuries
Examine cannula site for signs of infection, inflammation, redness, swelling or misplacement	To check for signs of infection and to ensure correct position of cannula.

Check monitor waveform	To ensure patent system and adequate blood flow
Suspend alarms and continue to observe patient visually	To reduce noise during the procedure and ensure patient safety.
Expose sampling port and swab with alcohol swab – allow to dry min 15 secs.	To reduce the risk of contamination
Using ANTT attach sterile syringe to the 3-way tap nearest the arterial line site and open sampling system to syringe.	To allow the saline in the dead space tubing to be withdrawn
Gently aspirate 5mls of blood (this is diluted with saline - the amount of blood aspirated will vary depending on the length of tubing). Close the 3-way tap to halfway and remove the syringe.	To allow the saline in the dead space tubing to be withdrawn and to obtain a pure sample of arterial blood.
Obtain blood samples with appropriate containers - (ABG syringe or connect sampling adaptor / holder if required for other blood sampling investigations). Close three-way tap.	To safely and accurately obtain required blood samples.
Remove sampling device. Flush the arterial line using brief intermittent flushing technique. Open the 3-way tap from the flush kit to the receiver and flush the sampling port until it is clear of blood.	3-way taps can become contaminated even when changed frequently. Often they carry the same organism that may be found elsewhere in the system, e.g. at the insertion site, so strict asepsis on obtaining samples is necessary to eliminate infection. It is essential to clear all traces of blood from the port of the 3-way tap. This reduces potential for organism growth.
Swab sampling port and cover with sterile red bung.	To reduce the risk of contamination
Re-zero the arterial line. Enable alarm system.	To ensure accuracy of readings and safely monitor the patient.
Observe limb for colour and pulse	To ensure procedure has been carried out with no detrimental effects.

## Notes

Be aware of risk of blocked line, air entrainment into line, thrombus formation, haemorrhage from line, infection, leaking flush system, age of flush system, blanching of limb, pain, tingling in limb

## RE-ZEROING

### AIM

To ensure accurate data is collected.

### INDICATIONS

- Upon insertion of an arterial cannula.
- At the beginning of each shift.
- If a discrepancy is noted.
- After a blood sample has been taken.
- After changing the flush kit.

### PROCEDURE

ACTION	RATIONALE
Use ANTT principles	To reduce the risk of contamination
Level the transducer with the insertion site	The arterial pressure will reflect changes on a moveable diaphragm, the transducer dome, through a fluid filled column. The arterial transducer should be level with the insertion point, i.e.. on the bed if the radial artery is used and the arm is on the bed.
Suspend alarms and continue to observe patient visually	To reduce noise during the procedure and ensure patient safety.
Using ANTT, switch the 3-way tap at the transducer off to the patient and open to the air and transducer.	
Press zero on appropriate channel on monitor. When digital display reads zero close port to air and open system to patient. Swab port and replace sterile bung.	
Keeping transducer level with the insertion site read the blood pressure from the monitor	
Observe the pressure waveform	

## CARE OF ARTERIAL LINE SITE

### AIM

To decrease the incidence of infection, phlebitis, and cannula related sepsis, to allow the opportunity to assess the patient for thrombus formation, infection, infiltration and leakage of fluid at the insertion site and circulation blanching. To preserve skin integrity.

### INDICATIONS

Daily or more often if indicated.

### EQUIPMENT

- ANTT tray & dressing pack
- Normal saline sachets
- Sterile adhesive dressing e.g.. IV 3000.

### PROCEDURE

ACTION	RATIONALE
Wash hands.	To reduce the risk of cross infection.
Explain the procedure to the patient.	To ensure that the patient understands & to alleviate anxiety
Prepare equipment using ANTT.	To reduce the risk of contamination
Suspend alarms and continue to observe patient visually	To reduce noise during the procedure and ensure patient safety.
Remove old dressing and inspect site. Examine cannula site for signs of infection, inflammation, redness, swelling or misplacement	To check for signs of infection and ensure correct position of the cannula.
Clean with saline and if necessary, change flush kit.	To observe and prevent contamination of insertion site and to change flush kit every 48hrs.
Dry site and secure with adhesive dressing	Maintain integrity of system.

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