INTRA-ARTERIAL LINE SAFESET® BLOOD SAMPLING SYSTEM - NETS

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- The SafeSet® Blood Sampling System has been designed as a closed loop system to prevent blood loss, maintain infection control and make efficient use of time and resources when obtaining blood samples
- Key points when in use:
- Pull back reservoir prior to priming and ensure it locks into place afterwards
- Ensure stopcock at patient end is turned opposite to sample port when drawing back blood or flushing the line, before and after taking a blood sample

CHANGE SUMMARY

- Safety Alert from manufacturer now included regarding over and under reading of BP
- 10/01/22: Minor review, updated Date Effective to 1st January 2022.

READ ACKNOWLEDGEMENT

- All NETS clinical staff should read and acknowledge they understand the contents of this document.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy Procedure and Guideline Committee	
Date Effective:	1st January 2022	**Review Period**: 3 years
Team Leader:	Clinical Nurse Educator	**Area/Dept**: NETS

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This Guideline may be varied, withdrawn or replaced at any time.

Rationale/Background

- Intra-arterial lines provide the most accurate beat to beat continuous monitoring blood pressure for critically ill patients, as well as providing a non-painful source for arterial blood sampling
- Ensure efficient use of the SafeSet® Blood Sampling System

Equipment

- SafeSet® intra-arterial line connector
- SafeSet® intra-arterial line system
- 50IU heparinised saline in 50mL 0.9% sodium chloride syringe
- Heparinised syringe for blood sample
- 2x Alcohol wipes
- Transducer cable

Procedure

System set up

- SafeSet® intra-arterial line connector should be connected to patient's cannula after insertion
- Ensure all connections of SafeSet® system are secure
- Connect heparinised saline syringe to extension tubing of SafeSet® system
- Once primed, connect SafeSet® system to patient via SafeSet® intra-arterial line connector
- Connect transducer and cable to monitoring and zero, ensuring transducer is placed in line with the Phlebostatic axis

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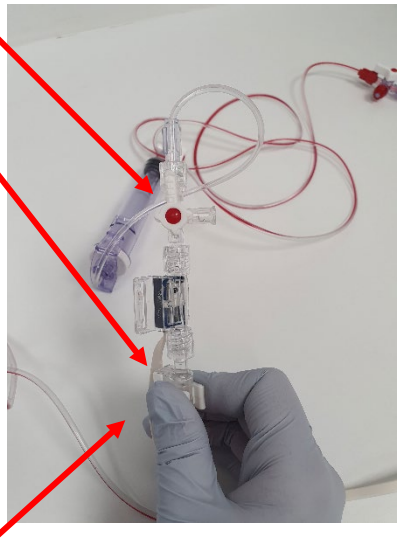
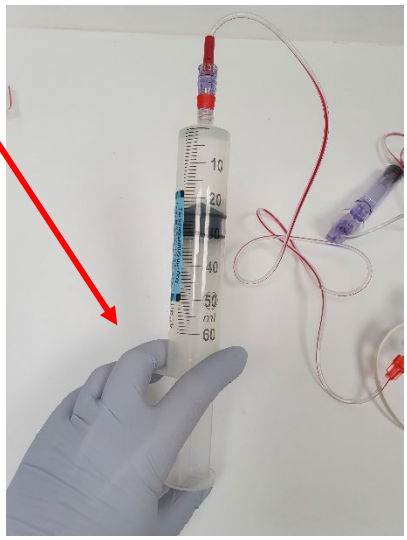
Priming the Line

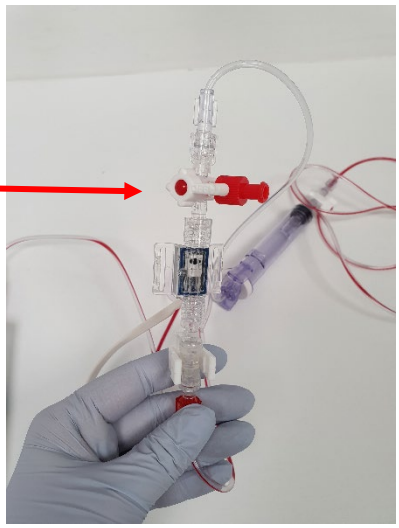
- Open stopcock closest to the transducer to air and then activate flush device to prime the zeroing port.



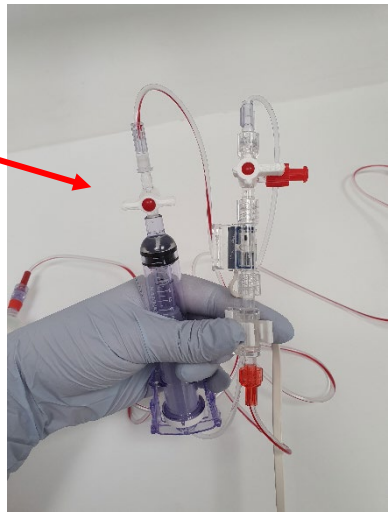
- Use manual pressure of the heparinised saline syringe to prime (keep flush device activated)



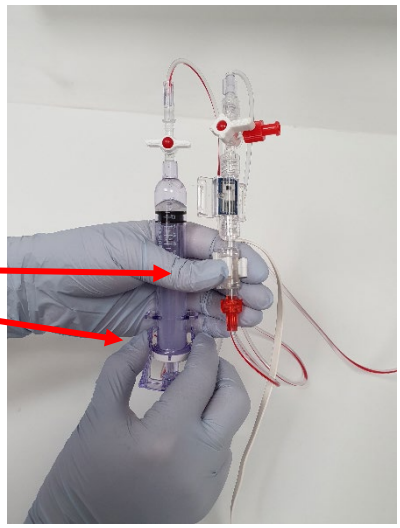
- Turn stopcock to 'off' position and close port with non-vented cap



- Turn reservoir stopcock 'off'

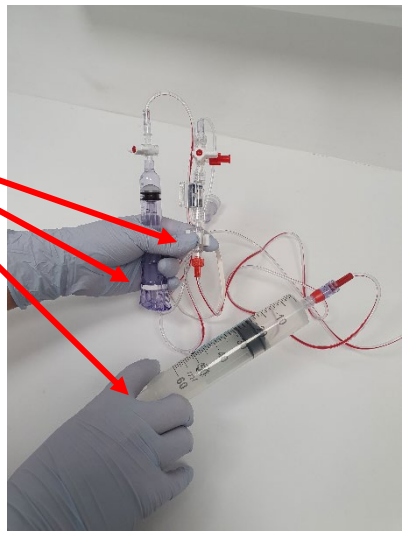


- Draw back reservoir to 6mL, keeping it in an upright position
    - Activate flush device and unlock reservoir, continue to draw back to 6mL



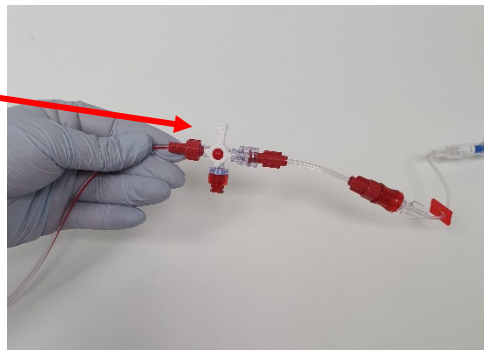
OR

    - Activate flush device and unlock reservoir, continue to prime from heparinised saline syringe to 6mL

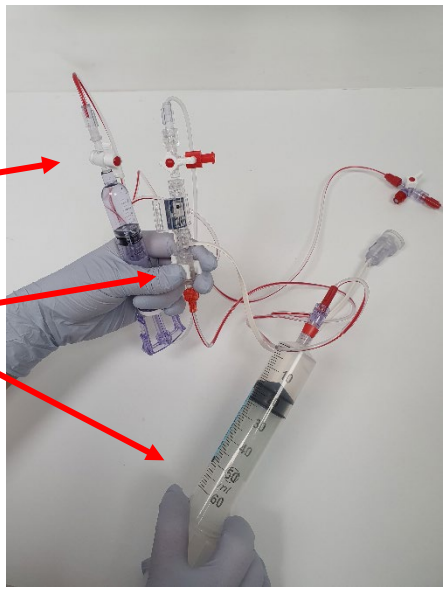


- Firmly tap side of reservoir to ensure any bubbles rise to the top of the reservoir

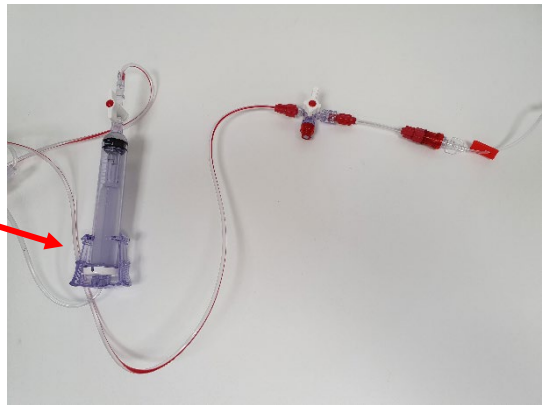
- Turn stopcock at patient end to 'on' position (opposite sample port)



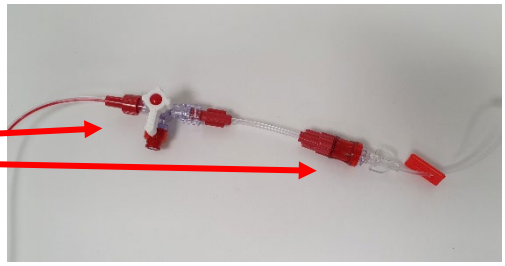
- Open reservoir stopcock, activate flush device and manually prime the line



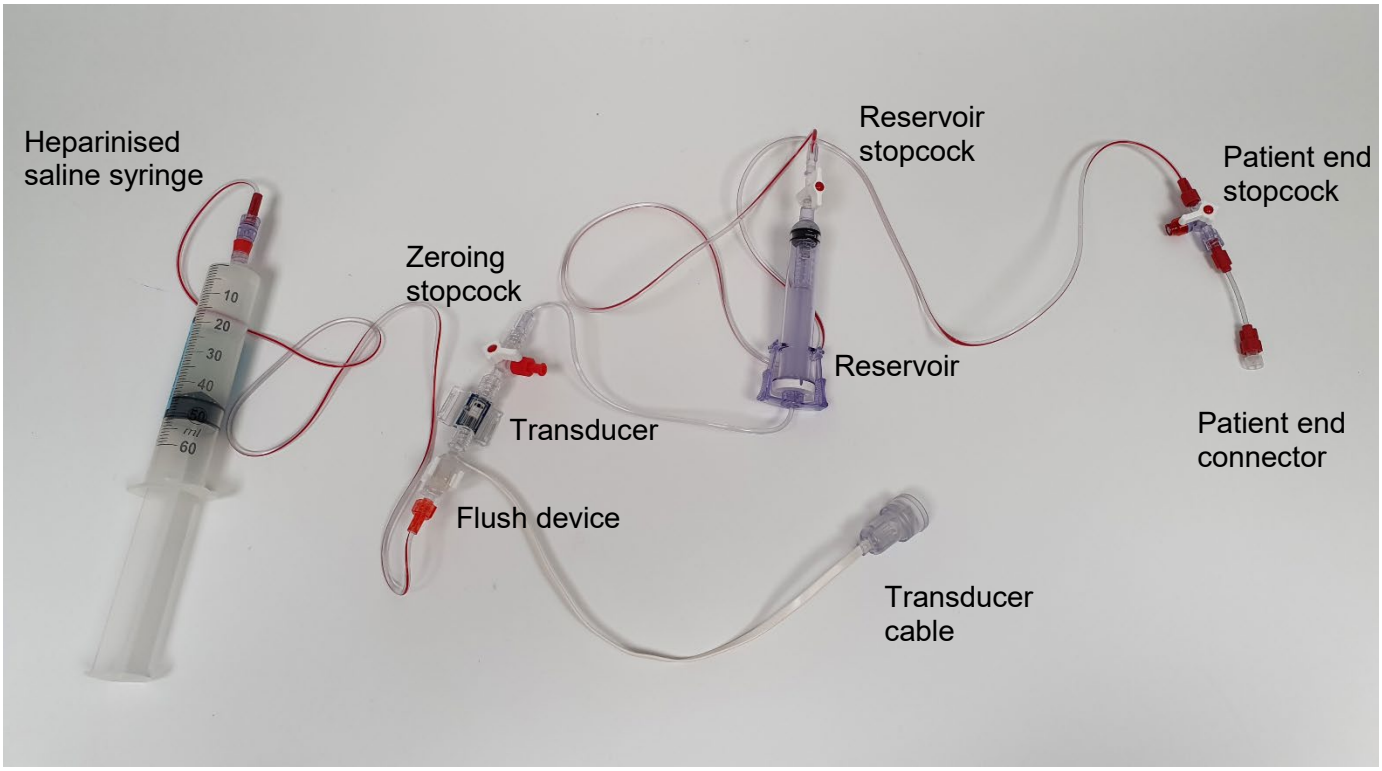
- Ensure there are no air bubbles within the reservoir then push and click the reservoir into the lock position



- Ensure there are no air bubbles throughout the rest of the line, attach to the patient and turn stopcock to 'off' position (in line with sample port

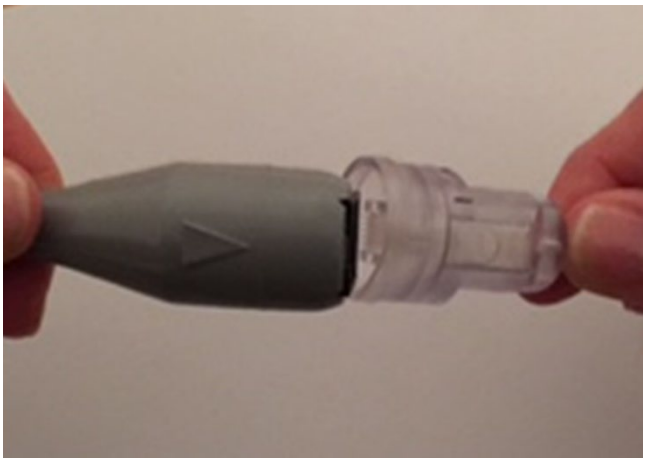
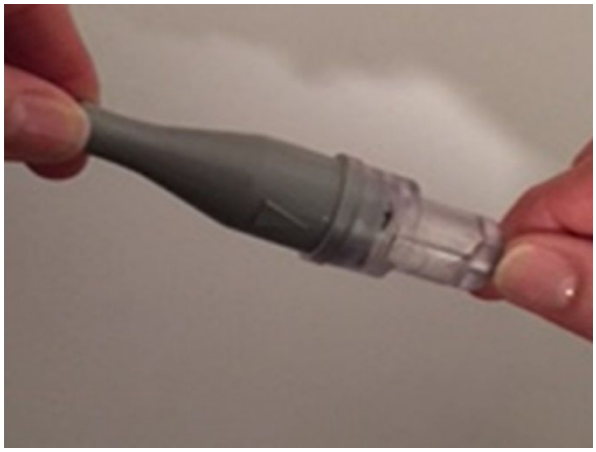


Complete system set up and prime



Connection/Disconnection of cable and transducer

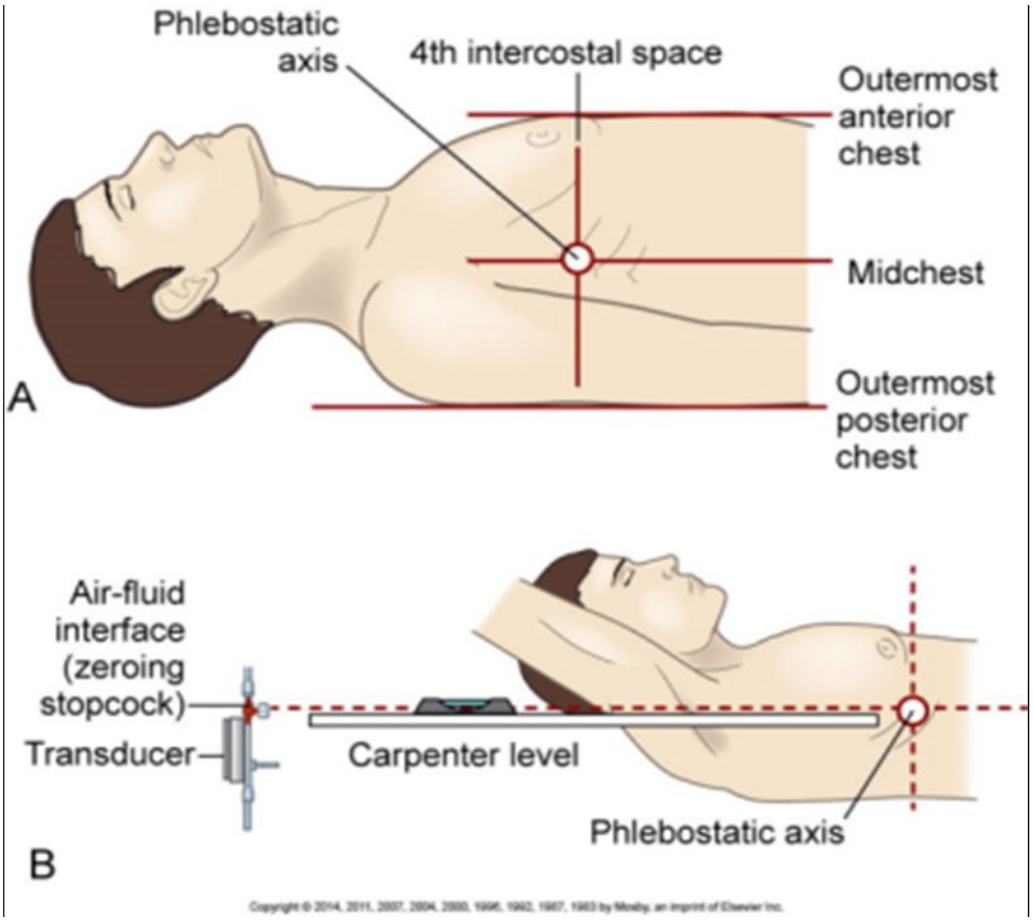
- To connect: Align arrows of pressure monitoring cable and transducer Transpac IT ‘boot’ and click into place

- To disconnect: **DO NOT PULL APART** – Press down over locking lever within clear ‘boot’ and wriggle out of connection until loosened


Transducer calibration (zeroing)

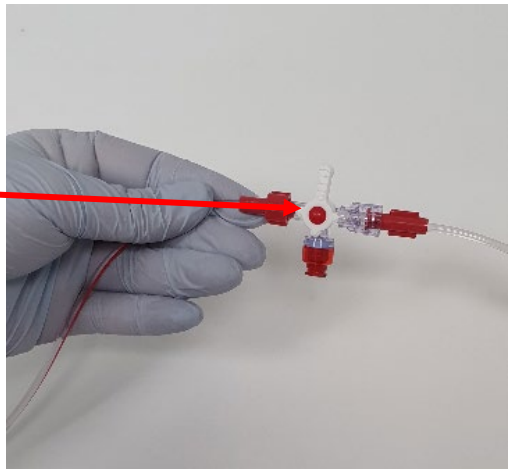
- Place the transducer at the level of the Phlebostatic axis



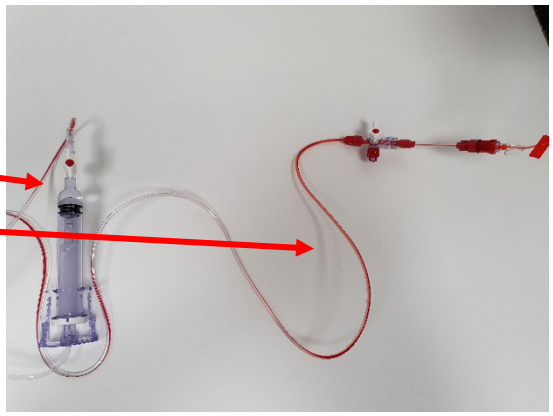
- Turn stopcock closest to the transducer off to the patient
- Remove non-vented cap and zero with port open to air
- Replace non-vented cap once calibration is complete and turn stopcock to off position
- Check monitoring commences and waveform is appropriate to patient's clinical condition

Blood sampling

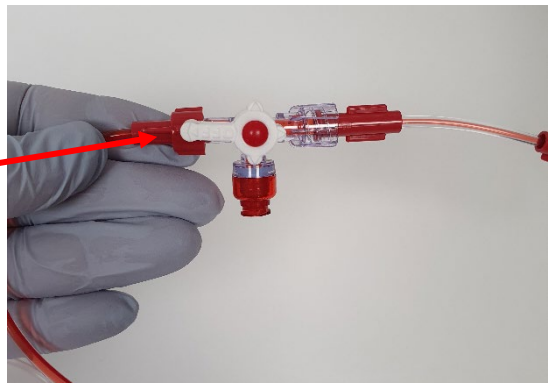
- Stopcock at patient end is turned to opposite of sampling port



- Draw back a minimum of 1.5mL into reservoir from patient, ensuring enough blood is cleared past the stopcock

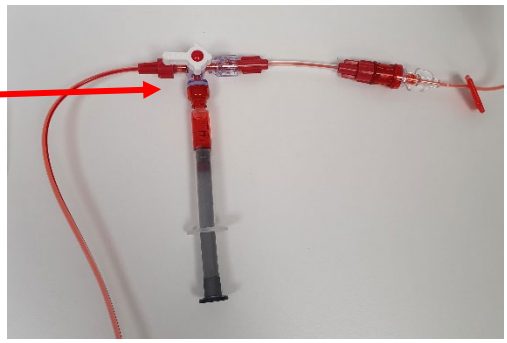


- Turn stopcock perpendicular to sample port (open to the patient and off to the line)



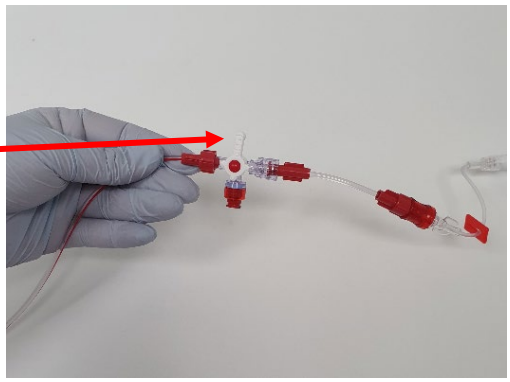
- Clean sample port with alcohol wipe

- Attach heparinised syringe and take required sample (NB for slip tip syringe push in and quarter turn to lock into place)

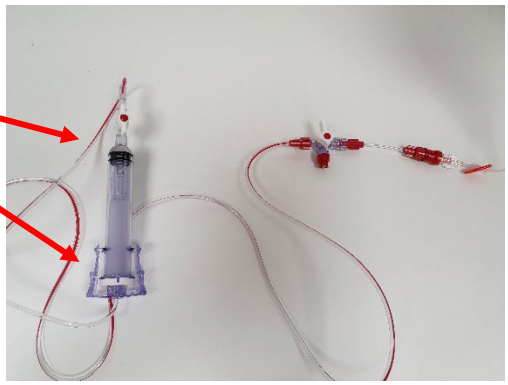


- Re-clean sample port with alcohol wipe after detaching syringe

- Turn stopcock back to opposite of sample port

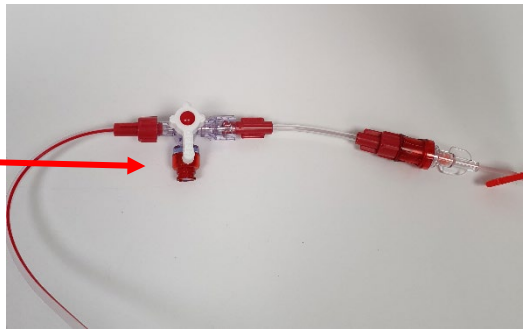


- Return 1.5mL from reservoir and lock into closed position



- Ensure the line is cleared of blood and no air bubbles are present

- Turn stopcock to off position (in line with the sample port)



This Guideline may be varied, withdrawn or replaced at any time.

Troubleshooting

- **Removal of blood or air in the line:**
  - Turn stopcock closest to the patient, off to the patient
  - Draw back required fluid into reservoir from syringe driver
  - Clean sample port closest to patient and attach syringe
  - Flush the line, ensuring all blood or air is removed
  - Detach syringe and clean sample port
  - Turn stopcock off to the sample port and ensure monitoring recommences
- **Ineffective monitoring of blood pressure:**
  - Check the patient
  - Check position of transducer to ensure at phlebostatic axis and re zero and level
  - Check intra-arterial line insertion site, check line for kinks, check limb
  - Ensure all cables are correctly placed, ensure taps are fully open
  - Ensure reservoir is clicked into the lock position
  - Check for air bubbles and clots – remove clots and bubbles with syringe via sampling port and change system if needed
  - Administer a small flush through the line to check patency
  - Check for any other environmental or technical factors that may influence or interfere with monitoring – check scale setting on monitor
  - Seek further assistance before changing the SafeSet® Blood Sampling System or removing the intra-arterial line

CAUSES FOR:

- **Underestimated blood pressure reading:** wide, slurred, flattened tracing
  - Air bubbles or clots
  - Catheter kinks, pressure against vessel wall
  - Added soft tubing
  - Arterial line is not getting continuously flushed – backflow
  - Inaccurate transducer position
- **Overestimated blood pressure reading:** narrow, high peaked tracing
  - Long tubing
  - Added stiff tubing
  - Stopcock valve/tap not completely opened
  - Micro air bubbles in line
  - Inaccurate transducer position (too low)

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Documentation

- Document the site of the intra-arterial line and perfusion of the limb on the observation chart and nursing report
- Document any adverse events
- Document the heparinised saline infusion, rate and volume infused on the observation and medication charts
- Document arterial blood pressure reading on observation chart

Further resources

- Arterial Catheter Management in Neonates – GCNC CHW Practice Guideline: www.schn.health.nsw.gov.au/_policies/pdf/2012-0004.pdf
- Invasive Arterial Monitoring – CICU – SCH Practice Guideline: www.schn.health.nsw.gov.au/_policies/pdf/2013-1025.pdf

References

1. ICU Medical 2017, SafeSet® Blood Sampling System, San Clemente, https://www.icumed.com/products/critical-care/closed-blood-sampling-and-conservation/safeset
2. ICU Medical 2017, SafeSet® Blood Sampling System Brochure, San Clemente, https://www.icumed.com/media/14813/m1-1226-safeset-sell-sheet-rev-03_ada_web.pdf
3. ICU Medical 2017, SafeSet® Blood Sampling System Troubleshooting Guide, San Clemente, https://www.icumed.com/media/14814/m1-1228-safeset-troubleshoot-rev-02_ada_web.pdf

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