Administration of Inotropes in Critical Care

Policy
This policy pertains to the use of inotropes and vasopressors within critical care.

Aim
To ensure safe administration of high risk medications.

Guidelines
All staff should have complete and up to date competencies on administration of drugs via Central Venous Catheter and Alaris Signature/B Braun Infusion Device.

Administration

- Use Central line lumen with three way tap for administration of inotropes.
- Use a designated lumen only.
- **Do not** under any circumstances bolus inotropes.
- Label bag clearly with NHS Lothian additive labels, use labels on infusion lines.
- Use drug library on B Braun pumps.
- Use photosensitive covers for infusion bags.
- Calculation of Drug Doses can be found on the intranet under
  Directory > Critical Care > Critical Care Drugs A to Z
- Be aware of specific actions and side effects of drugs used.
- Ensure patient has an arterial line in situ for invasive monitoring.
- Follow correct PPE recommendations and ANTT guidelines.
- Check blood sugars every 4 hourly or more frequently as required.
- It is recommended that 2 nurses should commence and change rate as per administration of medication policy.

Critical Care Guidelines
FOR CRITICAL CARE USE ONLY

Commencing Inotropes/Vasopressors

Apply Full Personal Protective Equipment

Follow ANTT Guidelines for cleaning designated lumen with Chlorhexidine 2% wipes

To assess line and smart site patency bleed back 5 mls blood and flush with 10mls of NaCL 0.9% prior to drug administration.

- Use Alaris Signature/B-Braun pumps specific to your service area.
- Enter inotrope/vaspressor on drug library (B- Braun).
- Insert line into device.
- Purge the line through to the end before connecting to patient.
- Commence starting rate at 2mls/hr.
- Ensure infusion is running continuously without alarming prior to connection.
- Connect line to three-way tap on CVC lumen, ensure tap is open to patient and no clamps are engaged.
- Titrate rate of infusion to achieve desired Arterial Blood Pressure.

For Inotrope infusions of the same drug and concentration, new bags can be spiked onto an existing line providing the line is in date and changed every 72hours.

Changing Inotrope/Vasopressor Infusion (due to expiry of infusion line)
Rapid changeover technique is recommended due to short drug half life.

- Ensure an extra pump is available at the bed space for rapid changeover technique. If the patient requires other inotropes/vaspressors consider another 3 way tap.
- Prepare new infusion in time to prevent interruption to delivery. Prepare the same strength of infusion as prescribed.
- Purge infusion line through to the end before connecting to patient.
- Commence new infusion rate at the same rate as existing infusion.
- Prior to connection, ensure new infusion is running continuously without alarming prior to connection.
- Connect the new infusion to the designated 3 way tap. Run the new infusion rate, observe for a small rise in ABP (MAP ≤5mmHg). When this occurs, stop old infusion rate and turn tap to ensure no flow is administered from old infusion.
- Keep old infusion line connected to lumen and within infusion pump for 1 hour **maximum** and then remove and discard.

Critical Care Guidelines
FOR CRITICAL CARE USE ONLY

Changing Concentration of Inotrope infusion

<u>INCREASING</u> concentration

- Prepare new infusion in time to prevent interruption to delivery.
- Prepare new strength as prescribed.
- Work out infusion rate as per infusion strength.

For instance if you are increasing noradrenaline strength from

80mcg/ml(8mg%) to
160mcg/ml(16mg%)

then your new infusion rate should be half of the existing rate i.e.

20mls/hr of 8mg% = 10mls/hr of 16mg%.

- Connect new infusion to the designated 3 way tap, run the new infusion rate, observe for a small rise in ABP (MAP ≤5mmHg). When this occurs, stop old infusion rate and turn tap to ensure no flow is administered from old infusion.

- Keep old infusion line connected to lumen and within infusion pump for 1 hour **maximum** and then discard.

<u>DECREASING</u> concentration

Please be very aware that starting a lower concentration at a higher rate will initially push the original higher concentration through the line at a faster rate than it has been running at.
You may need to start the new inotrope infusion **<u>at less</u>** than double the rate of the current infusion initially and titrate to effect.

N.B
Changing inotrope concentration will require a line change.

***Ensure ANTT guidelines** are adhered to when connecting new infusions to central lines.*

New central line placement and new inotrope infusion
Ensure new central line has been x-rayed (if chest line).
Prepare new infusion at the same strength as existing prescription.
The best practice for central line changeover is double pumping technique.
Commence new infusion via new central line at 2mls/hr.
Observe ABP continually for a rise in systolic pressure.
When this occurs, decrease old infusion by 2mls/hr and continue to follow this practice until the desired rate is achieved via the new central line.
Stop old infusion and keep connected to lumen in infusion pump for 1 hour maximum, discard and remove line as per medical staff instructions.

Discontinuation of inotropes and disconnection
Following discontinuation, keep inotropes attached for **maximum** of one hour with tap off to infusion line and CVC lumen clamped.
After disconnection, ensure line is patent by bleeding 5mls of discard blood and flushing lumen with 10mls of NaCL 0.9%. If unable to bleed back seek medical and/or nurse in charge advice.

References

Argaud L, Cour M, Martin O, et al. Changeover of vasoactive drug infusion pumps: impact of a quality improvement program.Crit Care 2007; 11: R133
https://www.ncbi.nlm.nih.gov/pubmed/18163908

Aseptic Non Touch Technique The ANTT Clinical Practice Framework
http://intranet.lothian.scot.nhs.uk/Directory/ANTT/Documents/Introduction%20to%20ANTT/ANTT%20Framework%204.0.pdf

Bangash MN, Kong ML, Pearse RM. (2012) Use of inotropes and vasopressor agents in critically ill patients. *Br J Pharmacol.* Apr; 165(7): 2015–2033.
https://www.ncbi.nlm.nih.gov/pubmed/21740415

Cour M, Bénet T et al (2016) Predictors of haemodynamic instability during the changeover of norepinephrine infusion pumps *Ann Intensive Care.;* 6: 38.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4840124/

Cour M, Heru R et al (2013) Benefits of smart pumps for automated changeovers of vasoactive drug infusion pumps: a quasi-experimental study *Br J Anaesth.* Nov;111(5):818-24
http://bja.oxfordjournals.org/content/early/2013/06/11/bja.aet199.full.pdf+html

Intensive Care Society (2010) Medication concentrations in critical care areas
http://www.ics.ac.uk/ICS/guidelines-and-standards.aspx?WebsiteKey=10967510-ae0c-4d85-8143-a62bf0ca5f3c

NHS Lothian Safe Use of Medicines Policy & Procedures (2019)
http://intranet.lothian.scot.nhs.uk/Directory/medicinespolicysubcommittee/Documents/Safe%20Use%20of%20Medicines%20Policy%20and%20Procedures.pdf

Title: Administration of Inotropes in Critical Care	
	Authors: Fiona Pollock, Jade MacKay
Status Draft/Final: Final	**Approved by:** QIT editorial group
Reviewed by: Kathryn Fitzsimons	**Written:** September 2017
Reviewed on: May 2019	**Next review : May 2021**