Delegation Protocol Number: 18

Delegation Protocol Title:
Intensive Care Vasoactive Continuous Infusion Titration – Adult - Inpatient

Delegation Protocol Applies To:
UW Health critical care patient in an adult Intensive Care Unit (ICU) or the Emergency Department (ED)

Target Patient Population:
Any adult critical care patient requiring a titratable vasoactive agent as identified in Table 1.

Delegation Protocol Champions:
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Jeff Fish, PharmD - Clinical Pharmacist
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Responsible Department:
Department of Pharmacy

Purpose Statement:
To delegate authority from the attending physician to Registered Nurses (RNs) in the intensive care units and emergency department to titrate vasoactive agents infusions in critically ill adults and to provide a framework for the ordering, initiation and titration of these agents.

Who May Carry Out This Delegation Protocol:
Any Registered Nurse (RN) in an adult ICU or ED

Advanced Practice Nurse Prescribers, Physician Assistants and Nurse Midwives may not delegate medical authority. Orders may be pended and routed for signature to these individuals but may not be implemented until signed by the provider.

Guidelines for Implementation:
1. A physician enters an order for a vasoactive agent with an initial starting dose. The order must include instructions for titration per Intensive Care Vasoactive Continuous Infusion Titration – Adult - Inpatient Protocol, with a targeted objective response (such as mean arterial pressure or heart rate). If patient status necessitates titration outside of Table 1, then the protocol cannot be implemented.
2. The rate and frequency of dose titration is dependent upon the patient's individual hemodynamic

parameters, clinical status, and response to therapy, but will not occur more frequently than indicated in the "Titration Dose Increment" and "Rate of Titration" columns of Table 1.

3. The lowest effective dose achieving the stated objective response will be utilized. The nurse records each dose increase or decrease in the IV/IV MAR. Vital signs will be monitored and documented with each rate change while on a stable continuous infusion, with minimum vital sign documentation being hourly. If the patient requires frequent or emergent dose titration, the patient will have continuous or cycled monitoring of vital signs. Vital signs and rate will then be documented at least every 15 minutes until vital signs stable.
4. If the dose of the vasoactive agent reaches the maximum ordered dose as listed in Table 1, the provider must be notified for consideration of an additional agent or to order dose escalation outside of the protocol.
5. When additional vasoactive agents are ordered subsequent to the initial vasoactive agent, the following titration will occur:
   5.1. The initial agent or agents will remain at the current rate
   5.2. Subsequent vasoactive agents, except vasopressin, will be titrated up according to the "Titration Dose Increment" and "Rate of Titration" columns of Table 1
   5.3. If vasopressin is added per protocol, it will be initiated at the "Typical Starting Dose" listed in table 1 or per physician order, and the dose will not be titrated up without a physician order
6. Initiation of weaning the vasoactive medication(s) to off occurs after the patient maintains their blood pressure at goal for 1-2 hours or as directed after other therapies are begun. Vasoactive infusions will be titrated off in the reverse order as they were started unless directed by the physician. Vasoactive infusions will be weaned off as indicated in the "Titration Dose Increment" and "Rate of Titration" columns of Table 1 based on reverse order of initiation.

Table 1. Vasoactive Titration Table

Drug	Typical Dose Range	Typical Starting Dose	Titration Dose Increment	Rate of Titration	Maximum ordered Dose (notify physician when dose reached)
Diltiazem	1-20 mg/hr	2.5-5 mg/hr[b]	2.5 mg/hr	30-60 min	20 mg/hr
Dobutamine	2-20 mcg/kg/min	2 mcg/kg/min	2.5 mcg/kg/min	5-15 min	20 mcg/kg/min
Dopamine	2-20 mcg/kg/min	2-5 mcg/kg/min[a]	1-5 mcg/kg/min[a]	1-15 min	20 mcg/kg/min
Epinephrine	0.01mcg/kg/min to effect	0.02-0.1 mcg/kg/min[a]	0.01-0.05 mcg/kg/min[a]	1-15 min	2 mcg/kg/min
Esmolol	50-300 mcg/kg/min	25-50 mcg/kg/min[b]	50 mcg/kg/min	5-20 min	300 mcg/kg/min
Labetalol	5-180 mg/hr	10 mg/hr	10 mg/hr	10-30 min	180 mg/hr
Milrinone	0.375-0.75 mcg/kg/min	0.375 mcg/kg/min	0.125 mcg/kg/min	15-30 min	0.75 mcg/kg/min
Nicardipine	2.5-15 mg/hr	2.5-5 mg/hr[b]	2.5 mg/hr	15-30 min	15 mg/hr
Nitroglycerin (mcg/min)	5-300 mcg/min	5-10 mcg/min[b]	5-20 mcg/min[b]	5-15 min	300 mcg/min
Nitroglycerin (mcg/kg/min)	0.1-3 mcg/kg/min	0.2-0.3 mcg/kg/min[b]	0.2-0.5 mcg/kg/min[b]	5-15 min	3 mcg/kg/min
Nitroprusside	0.1-10 mcg/kg/min	0.1 mcg/kg/min	0.25-0.5 mcg/kg/min[b]	1-15 min	10 mcg/kg/min
Norepinephrine	0.01 mcg/kg/min to effect	0.02-0.1 mcg/kg/min[a]	0.01-0.05 mcg/kg/min[a]	1-15 min	2 mcg/kg/min
Phenylephrine	0.25 mcg/kg/min to effect	0.25-1 mcg/kg/min[a]	0.25-0.5 mcg/kg/min[a]	1-15 min	5 mcg/kg/min
Vasopressin (septic shock)	0.01-0.06 units/min	0.03 units/min	Do not increase rate without MD order. Wean off by 0.01 unit/min	30-60 min	0.06 units/min

a. To treat hypotension: For patients with moderate shock (i.e: a mean arterial pressure (MAP) of 50 mm Hg up to their MAP goal), the RN may start on the low to middle end of the range. For patients with severe shock (i.e. MAP less than 50 mmHg), the RN may start in the middle to high end of the range. If unclear as to which dose to initiate, the RN should consult with unit pharmacist or provider.

b. To treat hypertension: the RN may start on the high end of the range. If using the medication for another indication and systolic blood pressure is <100 mmHg, the RN may start on the low end of the range. If unclear as to which dose to initiate, the RN should consult with unit pharmacist or provider.

Order Mode: Protocol/Policy, Without Cosign

References:

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Collateral Documents/Tools:

UW Health Vasoactive Continuous Infusions in Adult Patients – Adult – Inpatient Clinical Practice Guideline

Approved By:

UWHC Critical Care Committee: June 2010; August 2014*; June 2017
UW Health Nursing Practice Committee: June 2010; September 2014*; August 2017
UWHC Pharmacy Practice Committee: May 2010; October 2014*; June 2017
UWCH Pharmacy and Therapeutics Committee: May 2010; September 2014*, August 2017
UWHC Medical Board: June 2010; October 2014*; *September 2017

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- Expedited Review Process