Cardiac Short Stay: Pediatric Interventional Cardiology or Electrophysiology

Site Applicability

SPH Interventional Cardiology Unit

Practice Level

Specialized: Critical Care Nurses with post anesthetic recovery skills

Need to Know

- This standard is designed to highlight the specific and unique features of caring for a child/youth (under 19 years of age) in the Cardiac Short Stay Unit. Children and youth have unique clinical and developmental needs that vary from the standard adult patient population.
- When a child and/or family are identified as requiring case management for EP procedures; the Heart Rhythm Clinical Nurse Specialist (CNS) should be made aware through communication on the EP Booking form and emailed by the physician/MOA or Triage Coordinator.
- For pediatric patients associated with the PACH program, the CNS will communicate with the PACH team as case management is generally done by the PACH CNS.
- If not already communicated by the Triage Coordinator, the CNS will ensure that the impending admission of the child/youth is communicated to all services/groups including; anesthesiology, ECHO (if required), EP technologist, CNLs and nurses.
- Any specific patient needs or history should be provided on the EP Booking form. If an individualized plan of care is required; this will be developed by the CNS and shared with the team.
- Ideally, the vascular sheaths will be removed in the procedure room while child/youth is anesthetized and/or the use of vascular closure devices will be encouraged.
- Caring for a child/youth warrants increased vigilance. Subtle changes in a child's physical status (i.e. blood pressure decreasing by 10 mmHg) may be significant, and require the attention that similar findings in an adult would not.

Equipment and Supplies

The **Difficult Intubation Cart** contains pediatric sized respiratory equipment. The cart is located in the equipment storage closet and is maintained by anesthesia assistants.

Protocol

As per Cardiac Short Stay: Admission and Discharge (usual adult care) with additional considerations:

Assessment

Pre-Procedure:

- Complete focused cardiac assessment
  - HR & rhythm, BP, RR, temperature, SpO_2. See Appendix A
  - Pedal pulses including colour, sensation, strength, movement of lower extremities.
  - Pain assessment using the visual analog scale if appropriate. See Appendix B

Post-Procedure:

As outlined in Cardiac Cath Lab: Post Procedure, including:

- Uninterrupted one to one nursing care until the Modified Aldrete Scale is 8 or greater. See Appendix C. The receiving CSSU RN will meet the procedure room nurses and anesthesiologist at the child/youth's bedside.
- Re-establish SpO_2 monitoring, cardiac monitoring and BP monitoring. (usual order of preference)
- Auscultate breath sounds for stridor and adventitious sounds. Count respiration rate for one minute.
- Communicate admission vital signs to anesthesiologist.
- Pain assessment using the visual analog scale if appropriate. See Appendix B

Interventions

Environment

Nursing Assignment:

- The Nurse Educator/CNL will coordinate the nursing assignment to select RNs who have expressed an interest in caring for children/youth.
- The RN's assignment will be modified in order to attend to the unique needs of the child/youth.
- The Nurse Educator/CNL will inform the clerical staff to facilitate the timely clerical admission of the child/youth.

Bed Assignment:

- The child/youth will be admitted to a bed that is best able to meet their specific care needs, maximize their privacy and decrease environmental stimuli (to be determined by the CNL or nurse in charge).

Procedure Time:

- Whenever possible, a child/youth's procedure will be scheduled as the first case of the day.

Safety

Equipment:

- Ensure appropriate sized equipment at patient bedside. Perform safety check of emergency equipment.
- Set Cardiac Monitor alarm limits:
    - HR: High and low alarms 20 beats from baseline.
    - BP: High and low alarms set 10 mmHg from baseline.
    - SpO_2: Set minimum alarm at 92%
    - ST monitoring setting "on" as per standard practice
    - Adjust the alarm limits from initial settings as clinically appropriate.
    - See Appendix A for pediatric norms
- Both side-rails must be in the upright position when child/youth is left unattended in the bed.
- Show parent/caregiver how to lower and raise stretcher side rails.

Medication Administration:

- Refer to CST Medication Administration Policy and Independent Double Check and Double Check of Medication
- BC Children's Hospital Medication Administration – General Guidelines policy
- BC Children's Hospital Independent Double Check for Medication Administration - Policy

Radiation:

- A simple explanation of the x-ray room/ machine/ x-ray tube movements given to prepare the child. Consider music to achieve a psychologically calming atmosphere (goal is to require lower dose)
- Adaptation of positioning and set up for children to strive for reduction of patient motion. (This will help lower dose)
- Adaptation of technique for children to minimize dose; as outlined in the As Low As Reasonably Achievable (ALARA) principles of radiation safety.

Preparation:

- Nursing may apply EMLA cream as necessary. Ideally for 2 potential IV locations. (apply and cover with transparent dressing one hour pre-procedure).
- Communicate with attending anesthesiologist for IV insertion.

Documentation

Assessment and interventions are documented within the Cerner system in iView, Documentation and Adhoc Charting forms. Iview documentation includes Cath Lab Quick View, Periop Safety Departure and Intake and Output. Nursing Narrative Note may be documented in Documentation section.

Adhoc forms include:

- Periop Preprocedure Checklist Form
- Interventional Cardiology Assessment Form
- COVID-19 Patient Screening Form
- Nursing Discharge Checklist Form

Patient and Family Education

Family Assessment:

- Identify the primary caregiver
- Review the timeline of the day with the child/youth and family
- There is no minimum age of consent. Health care providers are encouraged to involve children and adolescents in the discussions involving their health and treatment. Where it is clear that the child or youth is competent to consent to treatment and that the treatment is in his/her best interest, the health care provider will obtain consent from the patient.
- Provide accurate, clear and simple information to family and child/youth regarding the procedure, highlighting the IV cannulation, transfer of child/youth into the lab, induction and emerging from anesthesia.
- Encourage the child/youth to ask questions
- Confirm the level of parental willingness, capacity and involvement with patient transfer into the lab and intubation process.
- Parents are encouraged and supported to accompany child/youth into the lab for induction. However, this may not be appropriate in every case.
- Discern whether the child/youth tends to be a distracter or an attender. Distracters require diversion while nursing/medical care is provided. Attenders seek to be involved and observe nursing/medical care provided.
- Consider other potential contributors to hospital experience, including past admissions/interventions, past health care experiences, needle/hospital phobia, input from past caregivers, individual concerns.

Discharge:

- Patient and family teaching regarding vascular access site care.
- Ensure attending physician communicates additional discharge instructions to patient and family.
- Review discharge guidelines and medication profile including anti-platelet medications

Related Documents

1. B-00-13-10086 – Cardiology Procedures: Monitored Anaesthesia Care/General Anesthetic CSSU
2. BD-00-07-40034 – Independent Double Check and Double Check of Medications.

References

1. Urden, LD, Stacy KM & Lough ME (2018). Critical Care Nursing (8th Edition). St Louis: Mosby.
2. Hockenberry, MJ & Wilson, D (2016). Essentials of Pediatric Nursing. St.Louis, MO: Mosby/Elsevier
3. International Association for the Study of Pain (IASP). Download the faces pain scale (FPS-R). https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1823&navItemNumber=1119

Appendix A: Pediatric Early Warning Signs (PEWS). Vital Sign Range in Children/Youth

BC PEWS Reference Card

Age	Heart Rate Beats per minute (CTAS 4-5)	Heart Rate Beats per minute (no PEWS score)	Respiratory Rate Breaths per minute (CTAS 4-5)	Respiratory Rate Breaths per minute (no PEWS score)	Systolic / Diastolic BP	MAP mmHg
0 – 28 days*	127 – 143	104 – 162	35 – 51	31 – 60	60 – 80 / 30 – 53	40 or higher
1 – 3 months*	127 – 143	104 – 162	35 – 51	31 – 60	73 – 105 / 36 – 68	48 or higher
4 – 11 months*	127 – 140	109 – 159	33 – 44	29 – 53	82 – 105 / 46 – 68	58 – 80
1 – 3 years†	112 – 120	89 – 139	29 – 30	25 – 39	85 – 109 / 37 – 67	53 – 81
4 – 6 years†	88 – 109	71 – 128	21 – 22	17 – 31	91 – 114 / 50 – 74	63 – 87
7 – 11 years†	78 – 95	60 – 114	19	15 – 28	96 – 121 / 57 – 80	70 – 94
12 plus years†	67 – 85	50 – 104	16	12 – 25	105 – 136 / 62 – 87	76 – 103
Temperature °C	**Oral:** 35.5 – 37.5, **Axilla:** 36.5 – 37.5, **Rectal:** 36.6 – 38, **Temporal:** 36.3 – 37.8					

HR, RR, and temperature ranges: CTAS 2013 BP ranges: *Modified from American Heart Association (2012). *Pediatric emergency assessment, recognition, and stabilization (PEARS) provider manual.*† National Heart, Lung and Blood Pressure Institute (2004). The fourth report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents. *Pediatrics, 114(2)*, 555-556.

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Appendix B: Visual Analogue Scale

Faces Pain Scale – Revised (FPS-R)

From *Pediatric Pain Sourcebook*, **www.painsourcebook.ca**
Version: 7 Aug 2007 CL von Baeyer

In the following instructions, say "hurt" or "pain," whichever seems right for a particular child.

"These faces show how much something can hurt. This face *[point to left-most face]* **shows no pain. The faces show more and more pain** *[point to each from left to right]* **up to this one** *[point to right-most face]* **– it shows very much pain. Point to the face that shows how much you hurt** [right now]**."**

Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so '0' = 'no pain' and '10' = 'very much pain.' Do not use words like 'happy' and 'sad'. This scale is intended to measure how children feel inside, not how their face looks.

Sources. Hicks CL, von Baeyer CL, Spafford P, van Korlaar I, Goodenough B. The Faces Pain Scale – Revised: Toward a common metric in pediatric pain measurement. *Pain* 2001;93:173-183. Bieri D, Reeve R, Champion GD, Addicoat L, Ziegler J. The Faces Pain Scale for the self-assessment of the severity of pain experienced by children: Development, initial validation and preliminary investigation for ratio scale properties. *Pain* 1990;41:139-150.

Fold here

0 2 4 6 8 10

From *Pediatric Pain Sourcebook*, **www.painsourcebook.ca**
Version: 7 Aug 2007 CL von Baeyer

Appendix C: Modified Aldrete Scale

Criteria for Discontinuing from One to One monitoring

- Modified Aldrete score for **Respirations** must be **2**; AND
- Modified Aldrete score for **Oxygen Saturation** must be **1 or greater;** AND
- **Total** Modified Aldrete score must be **8 or greater.**

Criteria for Discharge or Transfer from Procedure Clinic / Area

- 30 minutes after the last dose of sedation or analgesia is given; AND
- 120 minutes after the last dose of IV reversal agent administered (if given); AND
- **Total** Modified Aldrete score must be **10; (or return to pre anesthetic baseline)** AND
- Nausea and Vomiting must be acceptable to patient; AND
- Pain must be acceptable to patient; AND
- Dressing/operative site is dry or requires extra padding but marked and not increasing; hematoma present but not growing. Indication of potential internal bleeding absent.

Modified Aldrete Scale

Category	Criteria	Point Value
Respirations	Able to deep breath and cough freely	2
	Dyspnea or limited breathing	1
	Apneic	0
Oxygenation	Able to maintain SpO_2 greater than 92% on room air	2
	Requires supplemental oxygen to maintain SpO_2 greater than 90%	1
	SpO_2 below 90% even with supplemental oxygen	0
Circulation	Blood pressure +/- 20mmHg pre-procedure value	2
	Blood pressure +/- 20mmHg to 50mmHg pre-procedure value	1
	Blood pressure +/- greater than 50mmHg of pre-procedure value	0
Level of Consciousness	Awake and oriented	2
	Wakens with stimulation	1
	Not responding	0
Movement	Moves 4 limbs on own	2
	Moves 2 limbs on own	1
	Moves 0 limbs on own	0

Persons/Groups Consulted:

- Clinical Nurse Specialist, Interventional Cardiology, PHC
- Clinical Nurse Specialist, BC Children's Hospital
- Cardiologist, Electrophysiologist, PHC
- Clinical Nurse Educator Anesthetic Care Unit, BC Children's Hospital
- Anesthesiologist, Lead 5C/D
- Cardiac Anesthesiologist

Developed By:

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