CHBC Provincial Asthma Sim – Ongoing Management

Section 1: Case Summary

Scenario Title:	Ongoing Management of Pediatric Asthma
Keywords:	
Brief Description of Case:	This is a case of an 8-year-old child with a past medical history of asthma, who presented to the emergency department with a PRAM of 9. The child has improved after treatment (with PRAM scores fluctuating between 3-5) and is being admitted. The scenario starts as the child arrives to your inpatient unit.

Goals and Objectives	
Educational Goal:	Demonstrate ongoing assessment and management of pediatric asthma using the ongoing management recommendations in the CHBC Provincial Pediatric Asthma Management Guideline
Objectives: (Medical and Crisis Resource Management (CRM))	**Knowledge:** 1. Discuss and demonstrate recognition of pediatric asthma and illness severity (PRAM scoring) 2. Outline important education to support discharge of pediatric asthma patients **Technical Skills:** 1. Recognition of asthma severity utilizing the Pediatric Respiratory Assessment Measure (PRAM) Scoring Table 2. Demonstrate knowledge of ongoing asthma management 3. Demonstrate use of the CHBC Provincial Pediatric Asthma Management Guideline **Non-technical Skills:** 1. Demonstrate effective closed loop communication and defined role clarity. 2. Demonstrate crisis resource management and critical thinking 3. Demonstrate utilization of regional and provincial resources ***NOTE:*** *The BC Simulation Network's Crisis Resource Management Reference (CRM model v9) in Appendix A outlines the components of effective CRM and can also be downloaded from the BC Simulation Network Simulation Resources Page*
Entrustable Professional Activities (EPAs) Assessed:	N/A

Learners, Setting and Personnel				
Target Learners:	☒ Junior Learners	☒ Senior Learners	☐ Staff	
	☒ Physicians	☒ Nurses	☒ RTs	☒ Inter-professional
	☐ Other Learners:			
Location:	☒ Sim Lab	☒ In Situ	☐ Other:	
Recommended Number of Facilitators:	Instructors: 2			
	Sim Actors: 1-2 (parents, physician)			
	Sim Techs: 1			

Scenario Development	
Date of Development:	October 2024
Scenario Developer(s):	Trisha Thomson (CHBC), Matthew Thacker (CHBC), Catherine Marshall (CHBC, Claire Seaton (BCCH)
Affiliations/Institutions(s):	Child Health BC
Contact E-mail:	CHBCEducation@phsa.ca
Last Revision Date:	
Revised By:	
Version Number:	1

Facilitator Notes

BEFORE THE SIMULATION

1) **Pre-brief the group:**
   a. Welcome – introductions, sign-in
   b. Review overall format including approximate time for simulation and debrief. Remind that debrief often takes longer than scenario, but is the most important part
   c. Confidentiality – Review the steps taken to ensure the psychological safety of participants
   d. Engagement – Recognize this is a simulated environment but try to buy-in, the more you put into it and the more you'll get out of it
2) **Provide Orientation** (failing to give proper orientation may set participants up for failure):
   a. Manikin, monitors, code cart, meds & fluids, diagnostics, calling for help
   b. Child Health BC Provincial Documents
      1. Child Health BC Provincial Pediatric Asthma Management Guideline
      2. Child Health BC Pediatric Respiratory Assessment Measure (PRAM) Scoring Table
      3. Child Health BC Patient Education Resources:
         a. CHBC Pediatric Asthma Education Checklist
         b. Asthma Action Plan – 6 to 11 years (English)
         c. CHBC Asthma Wallet Card
      4. Ongoing Management of Pediatric Asthma Exacerbations Algorithm and Medication Reference
      5. PEWS Inpatient Flowsheet 7 to 11 years
   c. Equipment/Procedures in the case as needed – do a needs assessment (i.e. How to use Broselow tape and cart, IO insertion, pediatric fluid bolus etc.)
3) **Scenario briefing:**
   a. Review learning objectives with participants (knowledge/technical and non-technical skills)
   b. Roles – discuss roles, assign as needed

Section 2A: Initial Patient Information

A. Patient Chart					
Patient Name: Jamie			**Age:** 8 years	**Gender: N/A**	**Weight:** 30 kg
Presenting complaint: Shortness of Breath (CTAS 2)			**Admitting Diagnosis:** Asthma Exacerbation		
Temp: 36.7	**HR:** 132	**BP:** 98/64	**RR:** 28	**O_2 sat:** 96%	**FiO_2:** RA

Cap glucose: N/A	**GCS:** 15 (E: 4 V: 5 M: 6); Alert; **PAT**: Alert, Tracheal tug, Pink
Triage note: Cough and runny nose x 3 days. Woke up this am with shortness of breath. No relief with reliever MDI. Not using a spacer with the MDI.	
Patient History: In the emergency department Jamie received 3 doses of salbutamol and ipratropium via MDI in the first 60 minutes of presentation. Since the first hour, Jamie has needed salbutamol every 30-90 minutes. With a PRAM score between 3-5. The emergency room physician consulted the pediatrician on call, who has decided to admit Jamie to the in-patient ward. It has been 5 hours since the child arrived at the ED and the child is now arriving to the in-patient setting.	
Allergies: Environmental	
Past Medical History: Asthma.	**Current Medications:** Salbutamol MDI and Flovent MDI **Last dose of salbutamol in ED**: 2 hours ago

Section 2B: Extra Patient Information

A. Further History	
Include any relevant history not included in triage note above. What information will only be given to learners if they ask? Who will provide this information (mannequin's voice, sim actors, SP, etc.)? Patient has poor medication adherence (**Sim actor/facilitator** can play role of **guardian** to relay information: (eg. "patient has been too busy with school and forgets to take puffers") No systemic steroid was provided as part of the patient's management in the ED	
B. Physical Exam	
List any pertinent positive and negative findings	
Cardio: Sinus tachycardia	**Neuro**: Alert, orientated x3
Resp: Tracheal tug, auscultated wheeze on inspiration/expiration, decreased air entry (a/e) to bases	**Head & Neck:** Unremarkable
Abdo: Unremarkable	**MSK/skin:** Skin pink. Peripheral/Central cap refill 1sec
Other:	

Section 3: Technical Requirements/Room Vision

A. Patient
☒ Mannequin *(specify type and whether infant/child/adult) Child – 8 years approx..*
☐ Standardized Patient
☐ Task Trainer
☐ Hybrid

B. Special Equipment Required
☐ Cardiac monitor or vital signs machine (eg. Dynamap, etc.) and/or: saturation monitor, blood pressure cuff ☐ Age-appropriate PEWS documentation tools ☐ Child Health BC Pediatric Asthma Management Guideline ☐ Medication safe dosages reference guide ☐ Regional Pediatric Asthma Pre-Printed Orders or electronic order set if available ☐ Methylprednisolone parenteral drug therapy instructions ☐ Personal protective equipment ☐ MDI spacer with mouthpiece ☐ IV pump ☐ IV line

C. Required Medications
☐ Salbutamol MDI/nebules ☐ D5NS 1L bag ☐ Dexamethasone liquid 16 mg ☐ Methylprednisolone 30mg IV

D. Moulage
IV insitu to one hand

E. Monitors at Case Onset
☐ Patient on monitor with vitals displayed ☒ Patient not yet on monitor

F. Patient Reactions and Exam
Include any relevant physical exam findings that require mannequin programming or cues from patient (e.g. – abnormal breath sounds, moaning when RUQ palpated, etc.) May be helpful to frame in ABCDE format. **A:** alert, no foreign bodies/debris, no drooling/swelling, c-spine clear **B:** decreased air entry to bases, wheeze inspiratory/expiratory on auscultation, tracheal tug **C:** skin pink, pulses strong, rapid, regular, capillary refill 1 second, warm/dry skin **D:** alert **E:** no rash

Section 4: Sim Actor and Standardized Patients

Sim Actor and Standardized Patient Roles and Scripts	
Role	*Description of role, expected behavior, and key moments to intervene/prompt learners. Include any script required (including conveying patient information if patient is unable)*
Parent	Answers questions related to patient exam, as applicable. Cooperative with care.

Section 5: Scenario Progression

Scenario States, Modifiers and Triggers				
Patient State/Vitals	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State		Facilitator Notes
1. Baseline State **HR:** 132 **BP:** 98/64 **RR**: 28; inspiratory/expiratory wheeze on auscultation **O_2 sat:** 96% RA **T:** 36.7 ^oC **Glucose:** 5.6 mmol **Weight**: 30 kg **PEWS**: 4 **CVS**: cap refill 1 sec **PAT**: Pink, alert, suprasternal indrawing	*The child arrives to the in-patient unit. Last salbutamol 2 hours ago. Alert and cooperative, laying in bed.*	Expected Learner Actions ☐ Calculate PRAM score = 5 *Suprasternal indrawing - 2* *Inspiratory/expiratory wheeze – 2* *Air entry decreased bases - 1* ☐ Check and record HR, RR & SpO_2 ☐ Salbutamol 10 puffs via MDI ☐ Dexamethasone 0.6 mg/kg PO (max 16mg) ☐ Voice timeframe when next assessment to be completed (VS and PRAM score every 30 to 60 minutes)	**Modifiers** *Changes to patient condition based on learner action* ▪ 10 puffs salbutamol given --> wheeze improve to expiratory only, air entry improves bilaterally (and progress to State 3) **Triggers** *For progression to next state* • 10 puffs not given properly or within 10 minutes --> State 2 (severe PRAM) • 10 puffs salbutamol given and PO dexamethasone provided -- > State 3 (mild PRAM)	Physicians Orders: • Follow CHBC Provincial Pediatric Asthma Management Guideline for Vital Signs and PRAM frequency • Follow CHBC Provincial Pediatric Asthma Management Guideline for medication administration frequency • Dexamethasone 0.6mg/kg PO (max 16mg) • Diet as tolerated • O_2 to keep saturations equal to or greater than 92% ***Notes:*** Facilitator can verbally progress scenario to state 3 once learners have provided 10 puffs of salbutamol and voiced timeframe for next reassessment *"It is now 1 hour since you provided salbutamol to your patient, it is now time to reassess"* If the learners do not provide 10 puffs of salbutamol, the scenario would move to state 2
State 2. Severe PRAM	*Patients becomes more tachypneic with a decreasing saturation.*	Expected Learner Actions ☐ Reassess PRAM score = 8	**Modifiers**	Physicians Orders:

Rhythm: Sinus tachy **HR:** 146 **BP:** 98/64 **RR:** 41; audible wheeze **O_2 sat:** 91% **T**: 36.7 ^oC **PEWS**: 5 **CVS:** cap refill 1 sec **PAT:** Pink, alert, tachypnea/audible wheeze, suprasternal indrawing	*Wheezes worsen and air entry diminishes requiring an increase in PRAM score and a move to the severe PRAM pathway*	*O_2 saturation (less than 92%) – 1* *Suprasternal indrawing - 2* *Decreased air entry to apex & bases – 2* *Audible wheeze – 3* ☐ Call most responsible physician (update on new PRAM score) ☐ Administer salbutamol q 20 minutes x3 via MDI w/ mouthpiece ☐ Insert IV ☐ Hang maintenance fluids D5NS @ 60mL/hr ☐ Administer methylprednisolone 30mg IV over 20 minutes ☐ Administer O_2 via nasal prongs 1-3 L/min ☐ Place on continuous monitoring of HR, RR, SpO_2 ☐ Consult Respiratory Therapist (RRT)& Higher Level Of Care (HLOC)/CHARLiE (*if appropriate based on setting/site*)	• O_2 applied --> saturations increase by 3% • 1st round of salbutamol provided --> saturations increase by 3%, audible wheeze becomes inspiratory/expiratory wheeze only on auscultation, respiratory rate decrease by 5 • 2nd round of salbutamol provided --> inspiratory/expiratory wheeze becomes expiratory wheeze only, respiratory rate decrease by 5 **<u>Triggers</u>** *For progression to next state* • Medication management incomplete/not rapid --> end sim • after 2nd round of salbutamol and IV methylprednisolone initiated, facilitator can verbally progress scenario *'you have provided a 3rd dose of salbutamol, and it is 1 hour since beginning the severe pathway'* ---> State 3 (condition improvement)	• Follow CHBC Provincial Pediatric Asthma Management Guideline for Vital Sign and PRAM frequency • Follow CHBC Provincial Pediatric Asthma Management Guideline for medication administration frequency • Insert IV • D5NS @ 60ml/hr • Methylprednisolone 30 mg IV over 20 minutes

State 3. Recovery **Rhythm:** Sinus tachy **HR:** 140 **BP:** 98/64 **RR:** 31; inspiratory & expiratory wheeze throughout on auscultation. decreased air entry to bases **O_2 sat:** 97% on O_2, 94% on room air T: 36.7 ^oC **PEWS:** 4 **PAT:** Alert, tachypnea with suprasternal indrawing, pink	*After managing patient in the ongoing pathway, the patient improves with a decrease in Respiratory Rate and improvement in lung sounds/saturations.*	Expected Learner Actions ☐ Calculate PRAM Score = 5 *O_2 saturation -1 (if students do not take off oxygen this score is 0 – and a point of discussion for debrief – **oxygen needs to be removed for an accurate PRAM score**)* *Expiratory wheezing – 1* *Suprasternal retractions – 2* *Decreases air entry to base - 1* ☐ Reassess vital signs (HR, RR, SpO_2) ☐ Salbutamol 10 puffs via MDI ☐ Verbalize **management plan** (reassess PRAM & vital signs in 30 minutes and move to pathway according to PRAM score) and **education plan** (utilize CHBC asthma education checklist, advocate for Asthma Action Plan completion, fill out Asthma Wallet Card)	Modifiers • • Triggers • After verbalize plan of care and all actions complete --> end sim •	Physicians Orders: • Follow CHBC Provincial Pediatric Asthma Management Guideline for Vital Sign and PRAM frequency • Follow CHBC Provincial Pediatric Asthma Management Guideline for medication administration frequency ***Notes:*** Facilitator can verbally encourage participants to discuss education strategies once the students have outlined the care plan for their patient *"The physician agrees with your care plan and wants you to support patient education in preparation for discharge in the next 24 hours"*

Appendix A: Facilitator Cheat Sheet & Debriefing Tips

Include key errors to watch for and common challenges with the case. List issues expected to be part of the debriefing discussion. Supplemental information regarding any relevant pathophysiology, guidelines, or management information that may be reviewed during debriefing should be provided for facilitators to have as a reference.

Facilitator Debrief Guide: *Facilitate a conversation with the group following the BC Hot Debriefing Guide (Appendix C) which can be downloaded from the BC Simulation Network Simulation Resources Page*	
S	**Summarize the Case** Example Question: *"Can someone summarize the case in one or two sentences?"*
T	**Things that went well** Example Question: *"What did you think you did well?"*
	Review: Did we accomplish the Learning Objectives? Knowledge: ☐ Discuss and demonstrate recognition of pediatric asthma and illness severity (PRAM scoring) ☐ Outline important education to support discharge of pediatric asthma patients Technical Skills: ☐ Recognition of asthma severity utilizing the Pediatric Respiratory Assessment Measure (PRAM) Scoring Table ☐ Demonstrate skills of ongoing asthma management ☐ Demonstrate use of the CHBC Provincial Pediatric Asthma Guideline Non-technical Skills: ☐ Demonstrate effective closed loop communication and defined role clarity. ☐ Demonstrate crisis resource management and critical thinking ☐ Demonstrate utilization of regional and provincial resources
O	**Opportunities to Improve** Example Question: *"What would you change next time?"*
	KEY DEBRIEF POINTS: • Regardless of their previous PRAM score or management history, all patients moving to the ongoing pathway require assessment within 30 minutes of transitioning to this pathway/arrival to new care setting • Calculating the PRAM score guides assessment and intervention frequency throughout care • A severe PRAM score requires immediate notification to the MRP and escalation of salbutamol frequency • Consultation with RRT (where available) is important during severe asthma management • An accurate PRAM score includes removal of oxygen for oxygen saturation scoring • Doses of salbutamol are the same as the initial management algorithm, until weaning frequency with a prolonged mild PRAM score • Engage pediatrician on-call through local operator/on call system; or CHARLiE via Zoom at charlie1@rccbc.ca or phone (236)305-5352 • Early consultation to discuss patient management and transport is advised when the patient has persistent/severe respiratory distress or impending respiratory failure. Contact a higher level of care referral center to consult with a pediatrician/pediatric intensivist via Patient Transfer Network (PTN) (1-866-233-2337)

	• Nursing & Respiratory Therapist Support from Provincial Pediatric Intensive Care Units (PICU) • Further airway management resources can be found on the CHBC Pediatric Critical Care Resources In A Hurry website. • Education is an important piece of asthma management, and opportunities should be utilized throughout the patient's care when stable to provide education on how to best manage their asthma. Tools are provided throughout the CHBC guideline to support the education and knowledge acquisition
P	**Points of Action** Example Question: *"What additional support or resources do you need to be able to incorporate what you have learned today into your practice?"*

References

1) Canadian Pediatric Society (2021). *Managing an acute asthma exacerbation in children*. Canadian Pediatric Society Position Statement. Retrieved from: Managing an acute asthma exacerbation in children | Canadian Paediatric Society (cps.ca)

2) Translating Emergency Knowledge for Kids (TREKK). (2024). *Bottom line recommendations: asthma*. Retrieved from 2024_02_26_Asthma-BLR_FINAL_v2.1.pdf (trekk.ca)