McMaster Children's Hospital Green Book

For Residents and Clinical Clerks 2024-2025

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Welcome to MacPeds!

This handbook was designed for the large number of learners and staff from a variety of programs that rotate through McMaster Children's Hospital during their training. It may also be helpful for clinical clerks during their time on the pediatric wards.

Hopefully this demystifies some of the 'pediatric specific' logistics. This is intended only to act as a guideline for general pediatrics use.

We would very much appreciate any feedback, suggestions or contributions emailed to peded@mcmaster.ca.

Sincerely,
Bojana Babic and MacPeds Editors

Paging

To page someone from within the hospital:

1. dial 87
2. enter the person's pager number (4 digits)
3. enter the call-back extension (5 digits)
4. enter priority code (* then 1 for CODE/STAT, 2 for ROUTINE, 3 for ANYTIME, 4 denotes PHYSICIAN paging)

If you don't know their pager #, wish to leave a typed message, or to wait on an outside line: call **x76443.**

To inactivate/activate your own pager:

1. dial 88
2. enter your own pager #
3. dial 08

Pediatric CTU notes and Templates

SmartTexts

Save these templates as SmartPhrases to edit them, or add them to your favorites as-is.

Progress Notes	
HHS IP PED PROGRESS NOTE	HHS AMB PED COMPLEX CARE PLAN [23313] (to be used by Ped Complex Care in the Complex Care Emergency Action Plan section – not as a progress note)
HHS AMB COMPLEX CARE PLAN NOTE [21762] (to be used by Ped Complex Care for interdisciplinary group note whenever the Complex Care Plan is updated)	HHS AMB PED COMPLEX CARE FOLLOW-UP CLINIC NOTE [22120] (to be used by Ped Complex Care for interdisciplinary group note)
HHS AMB PED COMPLEX CARE INITIAL CLINIC NOTE [22117] (to be used by Ped Complex Care for interdisciplinary group note)	HHS AMB PED COMPLEX CARE VIRTUAL CLINIC NOTE [22121] (to be used by Ped Complex Care for interdisciplinary group note)

Consults	
HHS IP PED CONSULT NOTE	

Discharge	
HHS IP PED DISCHARGE SUMMARY	
HHS GEN PEDS REFERRAL	Search this template in the Communications tab and use it to send referrals to outside providers

Handoff Template	
HHS IP GEN HANDOFF SUMMARY	HHS IP HANDOFF TO DO
HHS HANDOFF SECTION TEXT	HHS HANDOFF PATIENT TEXT (PRINT - LONGER)
HHS HANDOFF PATIENT TEXT (PRINT - BRIEF)	

SmartLinks

Consider adding these SmartLinks within SmartPhrases that you create.

Helpful SmartLinks	
.SCRHRVIS: pull in the data from the hearing and vision screening	.BMI
.SSHADESS: pull in the SHHADESS assessment	

Orders

Order Sets

Save your own versions and edit them, or add them to your favorites as-is.

Order Sets	
GEN PED Admission: Kawasaki Disease or MIS-C	GEN PED Admission: Asthma
GEN PED Admission: Community-Acquired Pneumonia (CAP) (3 months of age and older)	GEN PED Admission: General
GEN PED Admission: Meningitis (3 months and older)	GEN PED Admission: Urinary Tract Infection
GEN PED Admission: Bronchiolitis	GEN PED Discharge to Home or Self Care

Provider Teams

Provider Team System Lists

There are system lists created for your provider teams. Consider saving these lists in a My List for easier access to your teams patients.

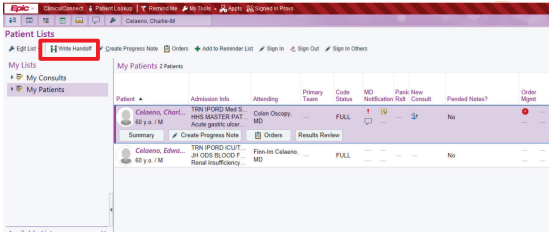
General Pediatric Teams	
General Pediatrics Acute Team 1 -MM	General Pediatrics Acute Team 2 - MM
General Pediatrics Complex Care Team - MM	General Pediatrics Consult and Surge Team - MM

Handover

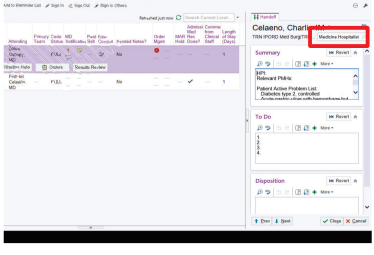
There are multiple tools within Epic to assist in handoff between providers. These tools function both within Patient Lists activity, and in an individual patient charts. This provides functionality for provider teams by combining all individual handover notes into one central list for every member of the provier team.

Writing a handoff report from Patient Lists

1. After selecting a patient, click the **Write Handoff** button pictured below:



2. A template will populate into the sidebar. With this activity, a physician can specify their discipline, note summary details about a patient, and specify 'To Do' items for the receiving provider:

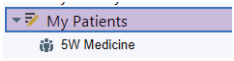


3. Pressing the next button will automatically save the note, and move on to the next patient on the list for documentation on their handover. A provider can alternatively press close to just save the note and close the report.

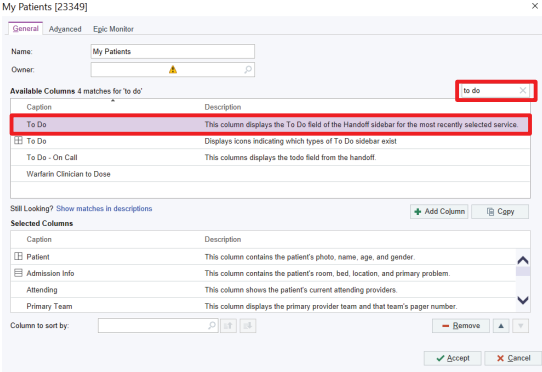
Adding the 'To Do' column to your Patient List

If you would like to see To Do items from the handoff report directly on your patient list, you can! This configuration can be achieved from any of your My Lists:

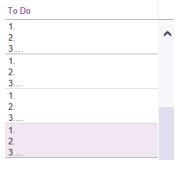
1. Right-Click on the My List you would like to add the column to, then select *Properties*.



2. Within the *General* tab, use the Search text field to find the 'To Do' column:

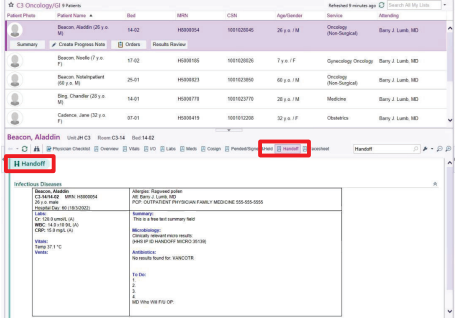


3. Double-click the column from the *Available Columns* list. It will then add the selected column to the *Selected Columns* list and default the column to the right-most position on the patient list. This position is customizable using the arrows below the *Selected Columns* list.
    a. Note: You can utilize this screen to remove or adjust the positioning of othe columns on your My List. The order you set them will match the order they display in the printed list.
4. The column will then appear, representing the To Do items from the handoff report:



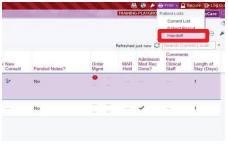
Viewing the handoff report from Patient Lists

1. To view a handoff report from Patient Lists, single click on the patient to expand the patient snapshot reports.
2. Click on the **Handoff** report (pictured below), and see that handoff notes are organized by the provider's specialty. The content of the specialty-specific handoff notes may vary per clinical specialty.
   a. *If the Handoff report is not available for quick select, expand report options with the magnifying glass!*

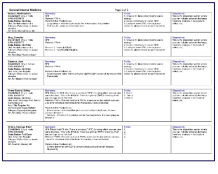


Printing a handoff report

1. To print out all handoff reports associated with a patient list, select the **Print** option from the right corner of the top toolbar. Within the dropdown select **Handoff,** to print Handoff reports:

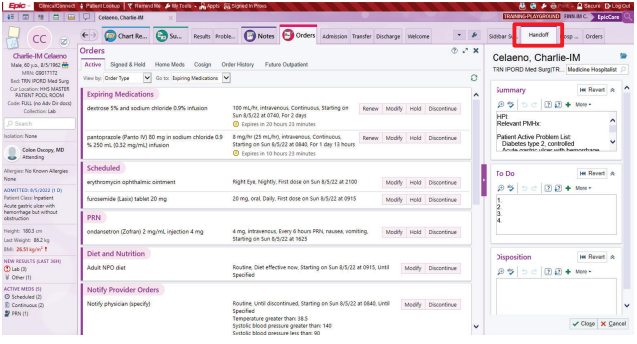


2. An example of the printout is included below:



Writing a handoff from a patient's chart

1. Within a patient's chart, a provider can select the Handoff activity in the sidebar. A template will populate into the sidebar. This sidebar functions identically to the one found from the Patient Lists activity. A physician can specify their discipline, note summary details about a patient, and specify 'To Do' items for the receiving provider:



Clinical Staff - Collect Sexual Orientation and Gender Identity

Update a patient's name **11**
Ask about sexuality, gender identity, sex assigned at birth, and pronouns **12**
Ask about sexuality 12
Ask about gender identity 12
Ask about sex assigned at birth 12
Ask about pronouns 12
Respond to patient concerns **13**

Collecting sexual orientation and gender identity information from patients allows your organization to monitor trends in care that are impacted by those factors. It also helps to ensure that patients receive appropriate care for risks they might face or organs they have present. Having easy access to information like the gender and name that the patient goes by also facilitates positive interactions between providers and patients.

Use this script to help start conversations with your patients about these topics. Feel free to adapt these scripts as needed, for example, you might have pediatric patients who identify as transgender, but aren't ready to talk about their sexual orientation. We recommend having these conversations with patients somewhere private without parents, guardians, or partners present, because the patient might not feel ready, or safe, disclosing this information in front of others.

Update a patient's name

If a patient goes by a name other than their legal one, record the name so that staff members interacting with the patient see what the patient wants to be called.

1. Ask: "Do you use a different name than your legal name that I should refer to you by?"
2. Click the patient's name from Storyboard.
3. Click next to the patient's name to open Name Edit.
4. Enter the name by which the patient should be addressed by in the **Preferred name** field and press **Tab.**
    - When you add the patient's preferred name, the **Preferred type** field defaults to First name, Preferred. If you're recording a complete preferred name, update the **Preferred type** field to reflect that.
5. Save your changes.
    - The patient's preferred name now appears on all patient documentation. The patient's legal name still appears on guarantor accounts and coverages, and both names appear on the Interactive Face Sheet.

Ask about sexuality, gender identity, sex assigned at birth, and pronouns

Collect sexual orientation, gender identity, pronouns, and other relevant information by accessing the SOGI SmartForm.

1. Click the patient's gender identity from Storyboard.
2. For guidance on how to collect this information from the patient, use the scripts below.

Ask about sexuality

1. Tell the patient: "To make sure all patients get the best possible care, we would like you to tell us about your sexuality and gender identity. Your answers are confidential, and only visible to those with access to your medical record."
2. Ask: "Which of the following best describes your sexuality? You can choose more than one answer."
3. Read all of the options to the patient.
4. Record the answer or answers in the **Patient's sexual orientation** field. If their answer is not an option, select **Something else**.

Ask about gender identity

1. Ask: "Which of the following best describes your gender identity?"
2. Read all of the options to the patient.
3. Record the answer or answers in the **Patient's gender identity** field. If their answer is not an option, select **Other.**

Ask about sex assigned at birth

1. Ask: "Which of the following best describes the sex that you were assigned at birth? This is the sex that someone observed when you were born, and likely was on your original birth certificate."
2. Read all of the options to the patient.
3. Record the answer in the **Patient's sex assigned at birth** field. If their answer is not an option, select **Uncertain.**

Ask about pronouns

1. Tell the patient: "I use [insert your pronouns here]. What pronouns do you use?"
2. Record the answer in the **Patient pronouns** field.

Respond to patient concerns

You might encounter patients who feel uncomfortable providing their sexuality and gender identity. It's important to be sympathetic to their perspective, because for some patients, disclosing their sexuality or gender might have had negative repercussions in the past.

The table below contains recommended answer to some potential patient responses.

Patient Response	Staff Response	What to Record
"Why do you need to know my sex assigned at birth?"	"It's important for me to have the complete picture so that I can accurately diagnose diseases and suggest the appropriate preventative care for you."	Whatever option the patient ultimately selects, or **Choose not to disclose** if they decline to answer.
"Can't you tell by looking at me?"	"I'm trained not to make assumptions so that I can record the information accurately. Would you like to hear the options again?"	Whatever option the patient ultimately selects, or **Choose not to disclose** if they decline to answer.
"It's not your business."	"I understand. I'll record that you don't wish to share."	**Choose not to disclose**.
"What are pronouns?"	"Pronouns are the words used to refer to a person without using their name. Common pronouns include he/him/his, she/her/hers, and they/them/theirs."	Whatever option the patient ultimately selects, or **Decline to answer** if they decline to answer.

Division of Pediatric Medicine – CTU 1 and 2 Expectations

Orientation:

At the beginning of each block, the attending should meet with their team members to review the objectives, expectation and schedule of the rotation. The senior resident and/or general pediatric fellow may have valuable input during this time.

Morning Handover:

Morning handover starts at 7:15 or 7:35. Team 1 will be late handover on odd days of the month. Team 2 will be late handover on even days of the month. At 8am the attending will meet with the NP and all trainees to review and divide the patients (10 min). A 20-minute morning report stye teaching on one of the admitted patients will occur after. It is therefore important to complete a succinct handover within your team's allotted 20 minutes.

On weekends, morning handover takes place at 8:30 for both teams.

Morning Huddle:

Morning huddles occur daily to discuss anticipated discharges as well as anticipated length of stay of all patients. These will occur with the attending pediatrician/fellow from 9:15-9:30am in 3Z conference room along with nursing and allied health staff. Discharge planning should always be occurring, and the team should be aware of potential discharges each day. The attending and SPR should aim to assess and discharge those patients promptly before the start of ward rounds.

See Patients:

After teaching, learners will see their assigned patients. The chart and nursing notes should be reviewed to identify any issues that have arisen overnight. The patient should be seen and examined. All lab work and radiological procedures that are pending should be reviewed. The house staff should then come up with a plan for the day and be ready to present that patient during ward rounds. It is not necessary that full notes be written at this time, as there will be time allotted for that later in the day. Potential consults for patients should be discussed with the attending and called during this time to facilitate timely assessments by subspeciality services.

Ward Rounds:

Ward rounds are to take place from 10:00-12:30. During ward rounds the attending pediatrician, SPR, and house staff will round on patients for their team. These are family-centered rounds. An effort should be made to have the family present, either at the bedside or outside the room, while the team is discussing the patient status and management plan. These are also work rounds and orders should be written while rounding on each patient. Some spontaneous teaching during rounds and at the bedside can occur during this time, however there is allotted time for that later in the day.

Multidisciplinary Rounds:

Multidisciplinary rounds take place for senior team members at 1pm on Monday, Wednesday and Friday in the 3Z conference room. When there is a long weekend MDR will occur the Tuesday after the long weekend at 1pm in the 3Z conference room. All team members are welcome to attend as interested, but not mandatory.

Patient Care:

During this afternoon residents will follow through with decisions made during ward rounds. This may include arranging investigations, consulting other services, or following up on results. Progress notes, dictations, and other documentation should be completed during this time. Team 1 and 2 members might be called upon to help the Consult admitting in the afternoon if there is a high number of consults.

Afternoon Teaching Sessions:

Afternoon teaching will take place at 2:00pm. The Division of General Pediatric Rounds will occur on the second Tuesday of the month from 12:30-1:30 pm. Please refer to the CTU teaching schedule for locations – this can be found following the QR code provided in your welcome e-mail OR clicking here.

Evaluations:

Time is left in the schedule for evaluations. This would be the time to give residents mid-way evaluations, as well as end of rotation evaluations.

Evening Handover:

Evening handover occurs at 16:40 or 17:00. The day team should provide the night team with printed patient lists. The team will then run the list and handover to the on-call team in iPASS format.

Division of Pediatric Medicine, CTU 1, 2, and 5 Weekly Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
7:15 - 8:00	Resident/Fellow Handover	Resident/Fellow Handover	Resident/Fellow Handover	Resident/Fellow Handover	Resident/Fellow Handover
7:30 - 8:00	Staff Handover	Staff Handover	Staff Handover	Staff Handover	Staff Handover
8:00 - 8:10	+Staff and Team meet to review and distribute patients	+Staff and Team meet to review and distribute patients	+Staff and Team meet to review and distribute patients	+Staff and Team meet to review and distribute patients	+Staff and Team meet to review and distribute patients
8:10 - 8:30	+Staff and Team Morning Report Teaching Pediatric Learner Led	+Staff and Team Morning Report Teaching Pediatric Learner Led	+Staff and Team Morning Report Teaching Staff/Fellow Led	+Staff and Team Morning Report Teaching Pediatric Learner Led	+Staff and Team Morning Report Teaching Staff/Fellow Led
8:30 - 10:00	Team to see patients, call subspecialists for consults	Team to see patients, call subspecialists for consults	Team to see patients, call subspecialists for consults	Team to see patients, call subspecialists for consults	Team to see patients, call subspecialists for consults
9:15 - 9:30	**Discharge Rounds	**Discharge Rounds	**Discharge Rounds	**Discharge Rounds	**Discharge Rounds
9:00 - 9:15	CQI (3C)	CQI (3Z)	CQI (3C)	CQI (3Z)	CQI (3C)
10:00 - 12:30	Team Rounds	Team Rounds	Team Rounds	Team Rounds	Team Rounds
12:30 - 13:00	Lunch		Lunch	**12:30 - 13:30** Lunch/ ^Academic Meeting - 1st Thursday **Clinical Meeting - 3rd Thursday	Lunch
13:00 - 13:30	**Team 1 MDR Rounds	**12:30 - 13:30** Lunch/ APM Rounds - 2nd Tuesday	**Team 1 MDR Rounds		**Team 1 MDR Rounds
13:30 - 14:00	**Team 2 MDR Rounds	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults	**Team 2 MDR Rounds	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults	**Team 2 MDR Rounds
14:00 - 15:00	^Teaching 3E26	ASP Rounds	^Teaching 3E26	^Teaching 3E26	^Teaching 3E26
15:00 - 16:20	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults	Patient care, follow up with subspecialists regarding consults, Team 1 and 2 support consults
16:20 - 17:20	Evening Handover	Evening Handover	Evening Handover	Evening Handover	Evening Handover

Resident Half Day (13:00 - 18:00)

Fellow Half Day (13:00 - 18:00)

+TEAM 1 TOUCH BASE AND MORNING REPORT WILL BE IN THE 3C CONFERENCE ROOM
+TEAM 2 TOUCH BASE AND MORNING REPORT WILL BE IN THE 3Z CONFERENCE ROOM
^These meetings to be attended by Faculty | **These meetings to be attended by Attendings and Nurse Practitioners
The CTU teaching schedule (along with this schedule) can be found on:
Medportal -> Postgrad -> Program -> Core Pediatric Residency Program -> Rotations – goals/objectives… -> CTU

MDR: Multi-Disciplinary Rounds
APM: Acute Pediatric Medicine Rounds
DPM: Divisional Pediatric Medicine Rounds
ASP Rounds: Antibiotic Stewardship Programme Rounds

Updated May 2024

Rounding Process: 3C – McMaster Children's Hospital

Purpose of rounds is to:

- collaboratively develop and communicate a plan of action for each patient with the Interprofessional health care team, the patient and the patient's family
- facilitate safe and timely patient discharge planning
- provide a forum for education
- provide excellent patient care

Pre-Rounding Agenda

*(to be done before round start time of **10:00**)*

Team Member	Pre-Round Tasks
SPR/Fellow/Staff/NP	• See watchers and new admissions as needed • See patients for pre-round discharge • Call urgent consultants and arrange urgent investigations/procedures
Resident/Clerk/NP	• Talk to patient/family and bedside nurse • Examine patient • Review physician progress notes, interprofessional team notes, medication profile, flow sheet data (VS, I/O, weight) and new investigation results • **Obtain computer for rounds**
Bedside RN	• Gather pertinent data to be presented (weight change, I/O, Urine Output, Fluid Balance, VS, etc)
Charge RN	• Create list showing patient rooms for each nursing assignment • Help with coverage while bedside nurse attends rounds

Notes for Rounds:

- Rounding time goal: **(10:00-12:30)**
- **Team 1 starts on 3C, Team 2 Starts on 3Z** unless watcher needs to be seen first
- SPR/Staff to monitor time and lead brief teaching points (1 per patient)
- Once a bedside RN joins rounds aim to round on all of their assigned patients
- Rounds to be completed in patient room unless otherwise requested by patient/family
- Information to be presented in a sensitive manner for all patients/families
- Pharmacist will attend rounds with each team on alternate days to assist in reviewing of medications

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Post-Rounding Agenda

Team Member	Afternoon Tasks
SPR/Fellow/ Staff/NP	• Help facilitate and arrange consults, investigations, or procedures • Complete family update if not already done at rounds (include junior learner if possible) • Ensure learners attend afternoon teaching on time • Ensure Handoff list is updated and review iPASS with learners before evening handover
Resident/ Clerk/ NP	• Arrange investigations/consults as discussed at rounds • Follow-up on any outstanding investigations • Attend afternoon teaching • Complete progress notes, update problem list and orders if there are any changes post rounds • If done early, help with new admissions/consults or transfers • Ensure **Handoff list is updated** with clear plan for oncoming night-time team • Communicate any changes to the plan made at rounds with bedside nurse/family *Note: Patient care to be completed **before** evening handover*
Bedside RN	• Implement orders
Charge RN	• Ongoing updates on plan from bedside RN and NP as applicable
Business Clerk	• Fax forms/consults for LHIN and Community providers and upload into Media folder on EPIC • Print Stickers for referral forms as needed

Rounding Process: 3C – McMaster Children's Hospital

Rounding Template

Section	Details		Presenter
ID	Brief sentence: gender, age, reason for admission and pertinent PMHx ***Note:*** *Only discuss presentation and initial workup if pt is new to team* Does this patient have a POST?		Resident/ Clerk/NP
Prioritized Issue List:	1. Issue #1 2. Issue #2 …		Resident/ Clerk/NP
Note: Nurse to present information below but resident/clerk/NP to review prior to rounds.			
Systems Review *Focus on concerns or pertinent negatives*	**VS & HPEWS**	Values for most recent VS & HPEWS score & team to visually review VS trends on WOW (***no longer saying VSS) *Reassess frequency of VS & continuous monitoring daily*	
	CNS:	LOC, Pain Management, Withdrawal (WAT Scores), NVS	Bedside Nurse
	CVS:	Perfusion, IV access (difficult?), IVF & Rate, Consider TKVO?	
	RESP:	Cough, Breath Sounds, WOB details, FiO_2, Secretions, Suctioning, NS Drops, Incentive Spirometry, Chest Tube	
	GI/GU:	Diet, Feed Amount (Route), TPN, Last BM (Consistency), G/JT?, Ostomy?, Drains? Abdo Girth, Emesis, **Today's Wt (↓or ↑from previous)**, Foley or I/O Cath? **Urine Output (ml/kg/h), Fluid Balance**	
	MSK/Skin:	Ambulation/Mobility, Pressure Sore Risk, Breakdown, Rashes, Wounds/Dressings	
	ID:	Isolation, New Diarrhea/Vomiting/Cough	
	Social:	Patient/Family Questions & Concerns, Stressors/Coping, Safety Concerns, **BSR**	
	Investigation /Procedures:	Frequency of Bloodwork, Outstanding Investigations or Procedures	Pharmacist will join rounds when available
	Medications	Review MAR, PRNs Given, **Held/Refused,** Stop Dates	
	Which Disciplines are Currently Involved → ☐CLS ☐OT ☐PT ☐RD ☐RT ☐SLP ☐SW ☐Wound Nurse ☐**Other**		
Assessment and Plan:	• Summary of relevant information from Systems Review, Physical Exam and Investigations/procedures. • Review subspecialists involved • **Present active issue list with assessment & plan for each** 1. Issue #1 – Assessment (i.e. cause of issue/differential) & Plan (further investigations, reassess meds, consult services, etc) 2. Issue #2 – Assessment & Plan … **Consider →** Hydration, Growth and Nutrition, and Discharge Planning → If Home & Community Care Support Services – HCCSS (formerly LHIN) services are needed: **Make sure to order in EPIC & give forms/order to Business clerk to E-fax**. • **Reassess Daily →** CRM/Cont $SP0_2$, Accurate I/O, freq of VS/Wt/bloodwork • **Orders →** review all active orders, learner/NP who is not presenting on current patient to update orders before moving on to next patient • **Review and Update Problem List**		Resident/ Clerk/NP
Conclusion	Final Summary (+/- revisions) of Plan		SPR/Fellow NP/Staff
Outstanding Questions and Concerns			Pt, Family & Team
Post Rounding Multi-D Rounds (MDR)	Mon-Wed-Fri → Team 1 at 13:00 & Team 2 at 13:20 Meet in the 3Z Conference Room with the Multidisciplinary Team to run through the patient lists.		NP/Staff

MacPeds
Training the next generation of pediatricians

AM Handover Guidelines

7:15 am
Early Team Handover

The **Early Team** will receive handover at this time
- ❑ **Team 1: Even** Days
- ❑ **Team 2**: **Odd** Days

Please bring your own printed list to handover

Weekend & Holiday AM Handover starts at 8:30am

The overnight JRs (junior residents) & clinical clerks will present new patients
Spend **2 to 3 min** for each patient and discuss:
- ❑ Name, age, main presenting complaint(s)
- ❑ Brief history with the most important pertinent positives/negatives
- ❑ Relevant past medical history
- ❑ Brief summary of objective findings (physical exam, investigations)
- ❑ Admitting diagnosis and plan

Try to remember to focus on information that will change or inform patient management!

Subspecialty AM Handover occurs in the PICU at either 7:30am or 9:00am on weekdays and at 9:30am on weekends & holidays

JRs present team issues:
- ❑ Briefly state overnight issue(s) and management
- ❑ Inform the team of any issues that need follow-up or task(s) that were handed over the night before
- ❑ If there are no overnight issues or follow-up, simply state "No issues" or skip the patient and move on

7:35 am
Teaching Session

Clinical Clerk/JR/SR will present a case seen overnight or a topic of interest. Points to include:
- ❑ Salient clinical features
- ❑ Diagnosis and differential diagnosis for the patient
- ❑ Acute treatment options and brief long-term management goals (evidence-based, if possible)

7:35 am
Late Team Handover

The **Late Team** will receive handover at this time:
"Team on Take = Handover Late"
- ❑ **Team 1**: Late Handover on **Odd** Days
- ❑ **Team 2**: Late Handover on **Even** days

7:50 am
Heme-Onc & Team 3 Handover

Heme-Onc & **Team** 3 will handover at this time to incoming residents, fellows or staff

MacPeds
Training the next generation of pediatricians

PM Handover Guidelines

*CTU Seniors are expected to contact the Weekend Day SPR to handover the weekend plans for patients on their respective teams

4:30 pm
Team 3

The incoming team will print their own lists – please have them updated by 4:30pm

- **Team 3** will give handover to the covering JPR (junior pediatric resident) along with the SPR (senior pediatric resident)
- Note: If this handover is expected to take longer than 10 minutes, the JPR will accept the rest of handover outside of the room and Team 1 or 2 will start handover

4:40 pm
Early Team Handover

The outgoing team will present team handover
Please follow the IPASS format

I-PASS
IMPROVING PATIENT HANDOFFS, SAFER CARE

I	Illness Severity	• Stable, "watcher," unstable
P	Patient Summary	• Summary statement • Events leading up to admission • Hospital course • Ongoing assessment • Plan
A	Action List	• To do list • Time line and ownership
S	Situation Awareness and Contingency Planning	• Know what's going on • Plan for what might happen
S	Synthesis by Receiver	• Receiver summarizes what was heard • Asks questions • Restates key action/to do items

(Starmer et. al, 2012)

Subspecialty **PM** Handover occurs at **5:30pm** in the PICU on weekdays, weekends and holidays

5:00 pm
Late Team Handover

The **Late Team** will give handover at this time:
"Team on Take = Handover Late"
- **Team 1**: Late Handover on **Odd** Days
- **Team 2**: Late Handover on **Even** days

Note: If the early team arrives late for handover, or has exceeded the allotted handover time, their handover will be interrupted by the Late Team Handover at 5:00pm. The Early Team can then resume handover once the Late Team has finished

5:20 pm
Heme-Onc Handover

Heme-Onc will handover to the JPR & SPR at this time.
Please ensure that patient lists are updated.

I	Illness Severity	• Stable, "watcher," unstable
P	Patient Summary	• Summary statement • Events leading up to admission • Hospital course • Ongoing assessment • Plan
A	Action List	• To do list • Time line and ownership
S	Situation Awareness and Contingency Planning	• Know what's going on • Plan for what might happen
S	Synthesis by Receiver	• Receiver summarizes what was heard • Asks questions • Restates key action/to do items

FIGURE 1
Elements of the I-PASS mnemonic.

Handover Format – the I-PASS breakdown

I: Status: stable vs. watcher

P: One-line summary of child and reason for admission
List of active issues +/- relevant management

A: Overnight action list

S: Anticipated overnight issues with management plans

S: Brief clarification from receiver (1-2 questions) if needed. If further questions, defer to end

PEDIATRIC HISTORY & PHYSICAL EXAMINATION

HISTORY

Identifying Data:
- Name, sex, age (years + months), race, who accompanies child, significant PMHx

Chief Complaint: in patient's or parent's words

History of Presenting Illness (HPI):
- Open-ended questions, allow parents/child to express their concerns
- Similar HPI details to an adult history
- Establish time line: "when was your child last well?", "what happened next?" etc.
- Select key symptoms and expand:
  - colour, character, quantity of vomit etc,
  - OPQRST of pain, aggravating/relieving factors etc
- Always ask about recent exposures to ill contacts – family, school

Past Medical History (PMHx):
- Significant ongoing medical problems
- Prenatal history:
  - Mother's age, gravida, live births, abortions etc
  - Planned vs unplanned pregnancy, onset of prenatal care
  - Complications, smoking, drinking, meds, drug use in pregnancy
  - Gestational age at birth
- Birth history:
  - Spontaneous vs induced labour, duration, complications
  - Presentation: breech, vertex, transverse
  - Interventions required: forceps, vacuum, c-section
  - Resuscitation required, Apgars, birth weight (conversion chart)
  - NICU, Level 2 nursery admission, duration
- Newborn history:
  - Common problems: jaundice, poor feeding, difficulty breathing
- Hospitalizations and significant accidents
- Surgical history

Medications – including dose changes, compliance
Allergies – list specific reaction
*** Immunizations** – ask specifically about Prevnar, Menjugate, Varivax, Synagis (if neonate).

Feeding History (if relevant):

- Breast feeding: exclusively?, duration, frequency
- Formula: brand, how is it prepared/diluted, # of feedings/day, quantity
- Solids: when started, tolerated, any reactions
- Vitamins (especially iron and Vit D): which ones, how often, dose
- Present diet: cereals, fruit, vegs, eggs, meat, amt of cow's milk
- Any difficulties with feeding? Any concerns from primary physician about poor weight gain?

Developmental Milestones (if relevant)**:**

- "Have you ever had any concerns about your child's development?"
- "How does child compare with siblings/peers?"
- Ask about current milestones in each category as appropriate for their age:
    - Gross motor
    - Fine motor, vision
    - Speech, hearing
    - Social skills
- Use major milestones (walking, first word, toilet training, etc) to assess previous development *(Reference in Development Section)*
- Use Denver II charts etc. to assess current stage of development

Social History

- Who lives at home? Who are primary caregivers? Parents work outside the home?
- Does the child attend daycare? How many other children? In a home vs. institution?
- Stability of support network: relationship stability, frequent moves, major events (death in family etc), financial problems, substance abuse in the home
- Has CAS ever been involved?
- School adjustment, behaviour problems, habits (nail-biting, thumb sucking etc), sleep changes

- How has this disease affected your child/ your family?
- What does your family do for fun? What does your child do for fun?
- For an asthma history: smoke, pets, carpets, allergens in the home, family history of asthma / atopy.

Family History:

- Are parents both alive and well? How many siblings? Are they healthy?
- Are there any childhood diseases in the family?
- Consanguinity – are mother and father related in any way?
- Relevant family history (3 generations) – autoimmune hx in Type I DM, atopic hx in asthma etc
- Draw pedigree if possible for genetic assessment

Review of Systems:

General: feeding, sleeping, growing, energy level
Signs of illness in kids: *activity, appetite, attitude (3 A's)*

HEENT: infections (how often, fever, duration): otitis, nasal discharge, colds, sore throats, coughs, nosebleeds, swollen glands, coughing or choking with feeding

Cardio:
Infants: fatigue/sweating during feedings, cyanosis, apneas/bradycardic episodes
Older kids: syncope, murmurs, palpitations, exercise intolerance

Resp: cough, wheezing, croup, snoring, respiratory infections

GI: appetite, weight gain (growth chart), nausea/vomiting, bowel habits, abdominal pains

GU: urinary: pain/frequency/urgency, sexually active, menarche/menses, discharge/pruritis/STDs

MSK: weakness, sensory changes, myalgias, arthralgias, 'growing pains'

Neuro: headaches, seizures (febrile vs afebrile, onset, frequency, type), tics, staring spells, head trauma

Skin: rashes, petechiae, jaundice, infection, birthmarks

PHYSICAL EXAMINATION

General Inspection

- Sick vs not sick?
- Toxic appearance? listlessness, agitation, failure to recognize parents, inadequate circulation (cool extremities; weak, rapid pulse; poor capillary refill; cyanotic, gray, or mottled colour), respiratory distress, purpura
- Level of consciousness
- Nutritional status – well nourished?
- Developmental status ("pulling up to stand in crib", "running around room")
- Dysmorphic features – look specifically at face, ears, hands, feet, genitalia

Vital Signs:

- Include Temperature, Heart Rate, Respiratory Rate, Blood Pressure and O_2 saturation

NORMAL PEDIATRIC VITAL SIGNS

Age	HR	SBP	RR
Newborn (<1 wk)	120-160	60-70	30-60
Neonate (<1 mos)	120-160	75-90	30-60
Infant (<1 year)	110-140	75-120	20-40
Preschool (3-5yrs)	90-120	75-125	20-25
Child (6-12 yrs)	80-110	83-120	16-24
Adolescent (>12 y)	70-100	90-130	12-18
Adult (>18 yrs)	60-100	90-130	12-18

Anthropometrics (plot on growth curves at every visit!):
- Height (supine length to 2 years, then standing height)
- Weight
- Head circumference (generally birth to 2 years, >2 yrs if specific concerns)
- Plot BMI (kg/m^2) on updated CDC growth curves for appropriate BMI for age

Hydration Status
- Comment on mucous membranes, tears, skin turgor, sunken eyes, in addition to appropriateness of vital signs, etc.
- For classification of mild, moderate, severe dehydration – see "Fluids & Electrolytes"

HEENT:
- Head: dysmorphic features, shape of skull, head circumference, fontanels in infants
- Eyes: strabismus, pupillary response, fundoscopy, red reflex in infants, conjunctivitis
- Ears & pharynx exam in any child with a fever!
- Nose: turbinates, deviation of septum, presence of polyps?
- Mouth: lips (lesions, colour), mucous membranes including gingiva, tongue, hard/soft palate,
- Dentition: presence of teeth, tooth decay
- Neck: lymphadenopathy, palpation of thyroid, webbing (Noonan, Turner syndrome), torticollis

Cardiovascular:
- HR, BP, apical beat, heaves/thrills
- Perfusion:
    - Pulses – strength/quality, femoral pulses in all infants
    - Capillary refill time
    - Skin colour: pink, central/peripheral cyanosis, mottling, pallor
- S1/S2, extra heart sounds (S3, S4)
- Murmurs:
    - Timing (systole, diastole, continuous)
    - Location of maximal intensity, radiation
    - Pitch and quality (machinery, vibratory, etc),
    - Loudness (I – VI / VI)

Respiratory:

- Audible stridor, sturtor, wheeze, snoring
- Position of child, ability to handle secretions
- Signs of distress: nasal flaring, tracheal tug, indrawing
- RR, O_2 saturation (current FiO_2), level of distress
- Able to speak in full sentences (if age appropriate)
- Depth and rhythm of respiration
- Chest wall deformities: kyphosis, scoliosis, pectus excavatum/carinatum
- Finger clubbing

Abdomen:

- For peritoneal signs: ask child to jump up and down or wiggle hips, to distend and retract abdomen "blow up your belly and then suck it in"
- Inspection: scaphoid/distended, umbilical hernias, diastasis recti
- Auscultation: presence of bowel sounds
- Percussion: ascites, liver span, Traube's space for splenomegaly
- Palpation: hepatosplenomegaly?, tenderness, guarding (voluntary, involuntary), masses (particularly stool presence in LLQ)
- Stigmata of liver disease: jaundice, pruritis, bruising/bleeding, palmar erythema, caput medusa, telangiectasia, ascites, hepatosplenomegaly

Genito-urinary:

- Anal position, external inspection (digital rectal examination in kids ONLY with clinical indication), Sexual Maturity Rating
- Male infants: both testes descended, hypospadias, inguinal hernias
- Females: labia majora/minora, vaginal discharge, erythema/excoriation of vulvovaginitis (NO speculum exam if pre-pubertal), Hymenal exam if indicated.

MSK:

- Gait assessment, flat feet vs toe walking vs normal foot arches
- Standing: genu valgum "knock knee" vs genu varum "bow legged"
- Joints: erythema, swelling, position, active/passive range of motion, strength, muscle symmetry
- Back: kyphosis, scoliosis

Neurological:

- Overall developmental assessment
    - Try playing ball with younger children, or even peek-a-boo!
- Level of consciousness (Glasgow Coma Scale if appropriate)
- Newborns: primitive reflexes, moving all limbs, presence of fisting?
- Cranial nerves: by observation in infants, formal testing in older children
- Motor: strength, tone, deep tendon reflexes, coordination
- Sensory: touch, temperature, position/vibration sense
- Cerebellar: gait (heel to toe, on heels, on toes, finger-to-nose, rapid alternating movements in older children, Romberg (eyes open then closed)

Derm:

- Jaundice, pallor, mottling, petechiae/purpura
- Rashes, birthmarks, hemangiomas, stigmata of neurocutaneous disorders

For helpful physical exam videos: http://learnpediatrics.com/videos/

ADOLESCENT INTERVIEWING (SSHADESS Screen)

- Interview teens alone with parents invited to join at the end (Alternatively, you can start with the parents in the room and have them leave at some point)
- Allow adequate, uninterrupted time to inquire about all aspects of their life, and high-risk behaviours in private setting
- Assure **confidentiality** at beginning of interview, and prior to discussing drug use and sexuality. Remember caveats of confidentiality (ie. if you are at risk of harm to yourself or others, or if someone is hurting you)
- Remember to obtain routine history including: Past Medical History, Meds, Allergies and Vaccines (HPV, hepatitis, meningococcal in particular)

Strengths

- What do you like doing?
- How would you describe yourself? How would your best friends describe you?
- Tell me what you are most proud of.

School

- Name of school, grade level
- What do you enjoy most/least about school?
- How many days have you missed or arrived late to school?
- How are your grades? Any different from last year?
- Do you feel like you are doing your best at school? (If no) Why not?
- What would you like to do when you get older?

Home

- Tell me what home is like…
- Who lives at home? How does everyone get along? What do you argue about? What are the rules like at home?

- Family members – ages, occupations/education, health status, substance abuse

Activities

- What do you do for fun? On weekends?
- Do you feel you have enough friends? Who are your best friends? What do you do together?
- Do you have any extra-curricular activities?

Drugs/Substance Use

- Have you ever tried cigarettes? Alcohol? Marijuana?
- Do you drink alcohol? Binge drinking on weekends?
- For younger teens: ask about friends' use and peer pressure
- Cover all drug classes: hallucinogens, amphetamines, rave drugs, IV drugs, crack cocaine, OTC meds, anabolic steroids. If D positive see M-SSTEP for next steps to screen for risk of withdrawal.
- What age did you start? Frequency of use? How much?
- What do you like/dislike about X? Why do you use X ?
- Do you use alone? Any police involvement? Dealing?

Emotions/Eating/Depression

- Have you been feeling stressed? Do you feel nervous a lot?
- Do people get on your nerves more than they used to?
- Have you been having trouble sleeping lately?
- Do you have concerns about your weight/shape?
- Have you tried to change your weight/shape in any way?
- Any bingeing or purging behaviours (includes diuretics/laxatives)
- Tell me what you eat/drink in an average day…
- ***TIP: Use growth curves to estimate 'healthy weight' based on height*
- Have you been feeling down, sad, or depressed?
- Depression screen – SIGECAPS

- Have you thought of hurting yourself or someone else? Have you ever tried to hurt yourself?

Sexuality

- Are you attracted to anyone? Tell me about that person. (Using gender-neutral language)
- Are you attracted to guys, girls, or both?
- What kind of things have you done sexually? Kissing? Touching? Oral Sex? Have you ever had sexual intercourse?
- How many sexual partners have you had?
- What do you use for contraception/STI prevention (condoms, OCP, Depo-provera, Emergency Contraception etc.)
- Any history of sexually transmitted infections?
- Have you ever been pregnant or gotten someone pregnant?
- Have you ever been forced or pressured into having sex?

Safety

- Do you regularly use: seatbelts? Bike helmets? Appropriate gear when snowboarding/skateboarding or other sports?
- Do you feel safe at school? Have you ever been bullied?
- Does anyone at home own a gun?
- Have you ever been the victim of violence at home, in your neighbourhood or at school?
- Has anyone ever hurt you or touched you in a way that was hurtful or inappropriate

M-SSTEP Algorithm

Positive Drug Use on SHADES?

NO → Provide positive reinforcement and education on substance use

YES → Assess Withdrawal Risk

STEP A - Assess Acute Withdrawal Risk

1. Assess risk of acute withdrawal from alcohol, opioids and benzodiazepines, by asking detailed substance history. Use "Step-A" questions.
   S – What **substances** are being used and how (i.e. smoking, injecting, oral, snorting)
   T – What was the **timing** of last use?
   E – Have they had **experience** with overdose or withdrawal?
   P – What is the **pattern** of use (i.e. daily, weekly, monthly, binge)?
   A – What **amount** is being used (i.e. quantity)?
2. Assess for current withdrawal signs and symptoms (from alcohol, opioids and benzodiazepines) using appropriate withdrawal assessments tools:
   - Alcohol (CIWA-Ar)
   - Opioids (COWS)
   - Benzodiazepines (CIWA-B)
3. Check urine (order UDRUGCOMP) if STEP A questions indicate use of opioids and/or benzodiazepines. Consider adding serum ethanol, ASA, Acetominophen. Inform patient and obtain consent. **see M-SSTEP Clinical Resource Guide for additional support**

Current symptoms of withdrawal? = Crisis Presentation

No current symptoms of withdrawal but possibility of future withdrawal? = Incidental Withdrawal

No current symptoms of withdrawal and no perceived risk for future incidental withdrawal?

Withdrawal plan needed NOW

STEP B - Assess Acute Withdrawal Risk

1. With data from the STEP A questions and the MSSTEP resource guide, develop a withdrawal plan. Ensure MRP is aware.
2. Communicate withdrawal risk (crisis or incidental) to front-line RN.
3. Consult Addiction Medicine Team (AMT) (via HHS paging, available Mon-Sun 0800-1700), for help with pharmacological management of acute withdrawal.
4. Consult pediatric social worker to provide supportive counselling as part of the admission order set.
5. Consider psychiatry consult if needed for assistance with the co-management of psychiatric issues
6. Consider nicotine replacement therapy (if applicable). See HHS policy and HHS order set

1. Continue to monitor vitals. If abnormal HPEWS or development of withdrawal symptoms, reconsider if patient is in crisis presentation and need for withdrawal plan
2. Use M-SSTEP Clinical Resource Guide for help
3. Notify SPR & MRP for further assesment

STEP C and Step D (see page 2)

Critical Reminders

- Risk of withdrawal warrants EARLY assessment and planning at admission.
- Withdrawal can be life threatening and can begin within hours of last use.
- Abrupt stops in substance use or periods of abstinence can initiate withdrawal. Patients with prior history of withdrawal are more likely to experience withdrawal. **Know your STEP-A answers!**
- Unintentional/unknown polysubstance use (Fentanyl lacing) is common. Youth are often unaware of this risk and may not disclose polysubstance history.
- Abrupt stops/period of abstinence lowers tolerance and this increases risks of poisoning and death. At discharge, or AMA consider role of Naloxone education (see M-SSTTEP Resource Guide for Naloxone information).
- In benzodiazepine withdrawal, avoid using antipsychotic medication due to the risk of lowered seizure threshold
- In opioid withdrawal, avoid benzodiazepines due to the added risk of respiratory depression; and avoid Clonidine due to false lowering of the patient's opioid requirements without preserving tolerance.

STEP C – Optimization of Withdrawal Plan

1. If not already done, consult AMT. Consider consulting again if optimization is needed.
2. Consider nicotine replacement therapy (if applicable) to ease withdrawal symptoms.
    a. See HHS policy and HHS order set
3. Consult Child Life Specialist to provide support re hospitalization and coping strategies.
4. Consult pediatric social worker (if not already done) for supportive counselling and support during hospitalization.
5. Consult Adolescent Medicine (during daytime hours) for:
    a. Any youth presenting with withdrawal (either crisis or incidental).
    b. Any youth with substance use and co-existing chronic illness (i.e. diabetes, cystic fibrosis)
6. Consult Psychiatry Consult Liaison (Mon-Fri 0800-1600) to assist with withdrawal plan, mental health issues.
7. Screen patient for the presence of a substance use disorder (within 24 hours of admission). Use the CRAFFT Screening Tool for Adolescent Substance Abuse

STEP D – Discharge Treatment Planning

1. Ensure appropriate follow up referrals are made *
    - Rapid Access Addictions Medicine Clinic (RAAM): for ongoing withdrawal management and/or diagnostic assessment for presence of a substance use disorder
    - Alternatives for Youth (AY): substance use and/or disorder support; family resources
    - Young Adult Substance Use Program (YA-SUP): Youth 17+ only for substance use assessment and treatment; concurrent disorder treatment; family support
2. Provide education about Naloxone Kits and where to access kits
3. Provide resources – pamphlets, resource list*

*Refer to M-SSTEP Resource for more information (Found here)

M-SSTEP (McMaster's Substance Support for Teens Through Education and Partnership)

Hamilton Health Sciences | St. Joseph's Healthcare Hamilton | McMaster University Health Sciences

Child & Youth Poverty Tool: Hamilton Region

A practical tool for clinicians

By Orianna Mak, MD & Ania Van Meer, MD
Updated February 2022

Poverty poses a significant risk to child and youth health, and should be addressed as such.

What can we do as healthcare providers to address this risk factor and reduce inequities?

ASK...

1. Do you have trouble making ends meet?
2. Do you have trouble feeding your family?
3. Do you receive the child tax benefit?
4. Do you have legal or immigration challenges?
5. Do you have a safe and clean place to live?
6. Are you/your child in need of dental care?
7. Are you concerned about your/your child's mental health?

TURN OVER FOR RESOURCES

Adapted for Hamilton from the Ontario Child Poverty Tool developed by Julia Morris MSc MD, Leo Levin MD, Barbara Neilson MSW, Barbara Muskat RSW PhD, Lee Ann Chapman, Gary Bloch MD, Maureen MacDonald RECE MEd and E. Lee Ford-Jones MD

1. Do you have trouble making ends meet?

Benefits & Supports
https://benefitswayfinder.org/

Special Support Program & Affordable Transit Pass
https://www.hamilton.ca/social-services/support-programs

Income Tax Clinics
https://hamiltontaxhelp.ca

2. Do you have trouble feeding your family?

Food Banks
Search "food banks" at https://redbook.hpl.ca/

Good Food Box
Affordable fresh fruit & veg program - on hold due to COVID
https://www.environmenthamilton.org/good_food_box

City of Hamilton Food Access Guide
Information on free/low-cost meals, student nutrition programs, food cooperatives, & more
http://foodaccessguide.ca/

Student Nutrition Programs
View their "Impact Report" for a list of program locations
http://www.tastebudshamilton.ca

Children's Breakfast Club
Nutritious, hot breakfast for children & families every school day from 7:45-8:45am at Compass Community Health (438 Hughson St N).

Community Fridges
24/7 access to free food in a community fridge & freezer

- 44 Greendale Dr, Hamilton, ON, L9C 5Z4
- 249 John St N, Hamilton, ON, L8L 4P4
- 204 Ottawa St N, Hamilton, ON, L8H 3Z5
- Corner of Locke St & Stanley Ave

Essential Aid - Infant & Toddler Food Bank
100 Main St E, Suite 201, Hamilton, ON, L8N 3W4
Mon/Wed/Fri 10am-12pm, Tues/Thurs 7pm-9pm

3. Do you receive child & family benefits?

Tax-free payments to eligible families to help with the cost of raising children <18. Includes the **Canada Child Benefit**, **Ontario Child Benefit**, & **Child Disability Benefit**
https://www.canada.ca/en/revenue-agency/services/child-family-benefits.html

Child Care Subsidy
Financial support for child care through the City of Hamilton
https://www.hamilton.ca/social-services

4. Do you have legal or immigration challenges?

Hamilton Community Legal Clinic
(905) 527-4572, https://hamiltonjustice.ca/

Ontario Council of Agencies Serving Immigrants
Information & services for newcomers https://settlement.org/

Community Legal Education Ontario https://www.cleo.on.ca/en

Legal Aid Ontario
Legal aid services for those who financially qualify. Call 1-800-668-8258 (Mon-Fri 8am-7:30pm) or visit http://www.legalaid.on.ca/

Hamilton Immigration Partnership Council
https://www.hamiltonimmigration.ca/

Justice For Children & Youth
Legal services for youth under 18 and homeless youth under 25
https://jfcy.org/en/

5. Do you have a safe and clean place to live?

Hamilton Housing Help Centre
(905) 526-8100 www.housinghelpcentre.ca

Ontario Renovates Program
Financial assistance for low-income families to repair substandard housing to a minimum level of health & safety
https://www.hamilton.ca/social-services/support-programs/ontario-renovates-program-homeowners

Good Shepherd Family Centre
24-hour intake line (905) 528-9442

Notre Dame House & Community Outreach Services
Youth-only (16-21) shelter & services (905) 308-8090

6. In need of dental care?

Healthy Smiles Ontario
Free dental care for children 17 & younger from low-income households. Automatic enrolment for families on OW/ODSP.
https://ontario.ca/healthsmiles

Dental Health Bus
Mobile outreach clinic offering free emergency dental services
https://www.hamilton.ca/public-health/clinics-services/dental-health-bus

Public Health Services Dental
Currently closed https://www.hamilton.ca/public-health/clinics-services/public-health-services-childrens-preventive-dental-clinic
For urgent dental needs, call (905) 546-2424 ext. 5369

Further list of dental programs & services in Hamilton
https://chs.hwcdsb.ca/support/parentresources/?fileID=172209

7. Mental health concerns?

Crisis Outreach & Support Team (COAST) 24/7 (905) 972-8338

Trans Lifeline 24/7 (877) 330-6366

Contact Hamilton
Entry point for child & youth mental health & developmental services. Self-refer at (905) 570-8888 or info@contacthamilton.ca
https://contacthamilton.ca/

Alternatives for Youth
Free substance use & mental health services (905) 527-4469
https://ay.on.ca/

Canadian Mental Health Association - Hamilton
(905) 521-0090, https://cmhahamilton.ca/

Free mental health phone apps for youth
Clear Fear, Smiling Minds

Need more help? Call the Community Health Help Line at 211 or visit www.211ontario.ca. 24/7, 365 days a year support in more than 150 languages[2]

FLUID MANAGEMENT IN CHILDREN

Children are at high risk of dehydration:
- Higher % total body water compared to adults
- Higher body surface area : mass ratio
- Higher metabolic rates
- Higher insensible losses
- Limited access to free water

Management of Dehydration
1. Assess severity and type of dehydration
2. Deficit Replacement
3. Maintenance Fluids
4. Replace Ongoing Losses
5. Reassessment and Monitoring

1. Assess Severity and Type of Dehydration
- Severity of dehydration dictates urgency of situation and need for acute resuscitation
- Degree of dehydration represents the percentage of body weight lost due to acute loss of fluids and electrolytes
- Degree of dehydration estimated based on history and physical exam (See Table on next page)
- Type of dehydration reflects relative net losses of water and electrolytes – based on serum Na+ or osmolality

Type of Dehydration	Electrolyte Status	Clinical Features
Hypotonic or Hyponatremic	Serum Na+ < 130 mEq/L Serum Osm < 270	Exacerbated signs of dehydration Risk of seizure
Isotonic or Isonatremic	Serum Na+ 130-150 mEq/L Serum Osm 270 – 300	
Hypertonic or Hypernatremic	Serum Na+ > 150 mEq/L Serum Osm > 300	Decreased signs of dehydration Irritable, increased tone and reflexes

Assessment of Degree of Dehydration			
	Mild	**Moderate**	**Severe**
% Weight Loss (by age)	5% (< 1 year) 3% (> 1 year)	10% (< 1 year) 6% (> 1 year)	15% (< 1 year) 9% (> 1 year)
General Appearance	Alert Thirsty	Drowsy Restless	Lethargic Cold, mottled limbs
Tachycardia	Absent	Present	Present
BP	Normal	Orthostatic Hypotension	Hypotension
Respirations	Normal	Deep +/- rapid	Deep + rapid
Fontanel or Eyes	Normal	Slightly depressed	Sunken
Tears	Present	+/-	Absent
Mucous membranes	Moist	Dry	Very dry
Skin turgor	Normal	Reduced	Tenting
Cap Refill	Normal	>2 secs	>>2 secs
Pulses	Present	Weak	Not palpable
Urine output	Normal	Oliguria	Anuria

2. Deficit Replacement

- To calculate fluid deficit:

Fluid Deficit = % Dehydration x 10 x body weight

- Each 1% dehydration = 10 ml/kg fluid deficit

Oral Rehydration Therapy

- ORT is the first-line treatment for mild - moderate dehydration
- Requires close monitoring and compliance of patient and parents
- Goal is to replace the deficit over 4 – 6 hours and replace ongoing losses by oral intake
- Initial rates of ORT:
  Mild – 1 mL/kg/5 mins
  Moderate – 2 mL/kg/5 mins
- Prefer solutions with balanced amounts of sodium and glucose (see table below)
- Feeding should be continued throughout oral rehydration to help maintain gut nutrition

Solution	Glucose (mEq/L)	Na (mEq/L)	K (mEq/L)	Base (mEq/L)	Osmolality
WHO	111	90	20	30	310
Rehydrate	140	75	20	30	310
Pedialyte	*140*	*45*	*20*	*30*	*250*
Pediatric Electrolyte	140	45	20	30	250
Infantlyte	70	50	25	30	200
Naturlyte	140	45	21	48	265

Parenteral Therapy (IV)

- IV therapy indicated for severe dehydration and patients who fail ORT due to: vomiting, refusal, or difficulty keeping up with losses
- Preferable site is IV, if unable to start IV use IO

(i) Restore Intravascular Volume

- Goal: expand ECF volume to prevent or treat shock and maintain perfusion

IV Bolus 10 – 20 ml/kg of N/S or RL
run over 15-20 mins or rapid push

- NEVER use hypotonic solution for boluses
- Avoid dextrose-containing solutions
- Monitor for improvement following each bolus – assess HR, BP, mental status, etc.
- May repeat boluses until patient is hemodynamically stable – If unstable, call Peds 1000!

(ii) Ongoing Deficit Replacement

- Goal: replace remainder of fluid deficit over next 24 hours
- Subtract boluses from deficit calculation
- Replace ½ deficit in first 8 hours, second ½ deficit over next 16 hours
- Solution:
  - D5 NS + 20 mEq/L KCL in isotonic dehydration
  - D5 ½NS + 20 mEq/L KCL in hypernatremic dehydration
- Solution chosen based on type of dehydration and serum electrolytes
- IV fluid rate should include deficit replacement + maintenance fluids (see next section)

3. Maintenance Fluids

- Fluid and electrolyte requirements are directly related to metabolic rate
- All patients, regardless of degree of dehydration, should be considered for maintenance fluids if oral intake is impaired
- Holliday-Segar Rule – maintenance fluid requirements calculated based on body weight for resting hospitalized patients (based on 100 ml for each 100 kcal expended)

Body Wt (kg)	Daily Rate (100-50-20)	Hourly Rate (4-2-1 rule)
The first 10 kg (1-10 kg)	100 mL/kg/day	4 mL/kg/hr
The 2nd 10 kg (11-20 kg)	+ 50 mL/kg/day	+ 2 mL/kg/hr
Any Additional kg (>20 kg)	+ 20 mL/kg/day	+ 1 mL/kg/hr

- Insensible water losses = cutaneous + pulmonary water losses which are calculated as ~ 300 – 500 cc/m^2
- Important to assess factors affecting insensible and/or urinary fluid losses – may need higher maintenance rate
- Normal Na+ and K+ requirements 2 – 4 mEq/kg/day
- Also affect factors affecting Na and K balance – may need to include additional supplementation
- Solution:
  - D5 ½ NS + 20 mEq/L KCL
  - D5 NS + 20 mEq/L KCL
- Adding 5% dextrose to maintenance solution prevents protein catabolism (Use D10W in neonates and hypoglycemia)
- Solution chosen based on type of dehydration and serum electrolytes
- D5 ½ NS + 20 mEq/L KCl provides 4 mEq/100 mL Na+ and 2 mEq/100 mL K+
- Only add K+ if patient is voiding

4. Replace Ongoing Losses

- Assess patient for additional fluid losses – diarrhea, vomiting, polyuria, drains, etc
- Estimate output over 4-6 hours then replace volume
- Replacement fluid dependent on source of losses

Replace…	With…
Gastric Losses (Vomiting)	½ NS + 10 – 20 mEq/L KCl
Stool or Intestinal losses (Diarrhea)	Add HCO_3^- to ½ NS + 10 – 20 mEq/L KCl
CSF losses	0.9% NS
Urine Output	As indicated
Losses due to Burns	Increase fluid administration (Parkland formula)

5. Reassessment and Monitoring

- Important to continually assess patient's hydration status and fluid requirements
- Monitor HR, BP, Cap refill, mental status and urine output
- Accurate INS and OUTS, repeat weight measurements
- May require cardiorespiratory monitor, CVP, ECG
- Check serum electrolytes routinely while patient on maintenance fluids
- Other labs as indicated: BUN, Cr, serum osmolality, urine specific gravity, urine osmolality
- Adjust type and rate of IV fluids depending on clinical and biochemical indicators of volume status
- Discontinue IV fluids once patient has returned to normal status and tolerating normal feeding

Comparison of IV Solutions

IV Solution	Na^+ (mEq/L)	K^+ (mEq/L)	Cl^- (mEq/L)	Dextrose (g/L)	Osmolarity (mOsm/L)
Sodium Chloride 0.45%	77			0	154
Sodium Chloride 0.9% (0.9 NaCl, NS)	154		154	0	308
Sodium Chloride 3%	513			0	1030
Dextrose 5%	0			50	250
Dextrose 5% Sodium Chloride 0.2%* (D5 0.2NS)	39			50	320
Dextrose 5% Sodium Chloride 0.45% (D5 ½NS)	77		77	50	405
Dextrose 5 % Sodium Chloride 0.9%	154			50	560
Dextrose 10%	0			100	505
Dextrose 10% Sodium Chloride 0.2%*	39			100	575
Dextrose 10% Sodium Chloride 0.45%*	77			100	660
Dextrose 10% Sodium Chloride 0.9%*	154			100	813
Dextrose 3.3% Sodium Chloride 0.3% (⅔ * ⅓)	51		51	33.3	273
Lactated Ringers†	130	4	109	0	273

†Also contains Calcium (Ca^{2+}) 1.5 mmol/L, and Lactate (HCO_3^-) 28 mmol/L
*These solutions are not commercially available
Commonly used solutions are highlighted

Guidelines for Prescribing Maintenance IV Fluids in Children

- These are general guidelines for ordering maintenance IV fluids (IVF) only, and do not apply to resuscitation or complicated fluid and electrolyte disorders. ***Seek additional advise/appropriate consultation in the event of fluid and electrolyte abnormalities.***
- Consider IV fluids as DRUGS - individualize prescriptions *daily* according to objectives, and monitor for potential side effects.
- Be aware that the commonest side effect of IVF therapy is HYPONATREMIA, particularly in patients at risk, and if hypotonic solutions are used

Step 1:

Determine IV fluid rate, according to "maintenance fluid" requirements, and replacement of deficit or ongoing losses (Total Fluid intake (TFI). In general maintenance fluid rate is calculated by the "4:2:1" guideline, but should be individualized according to the clinical condition and patient assessment

Weight (kg)	ml/hour
0-10	4/kg/hour
11-20	40 + (2/kg/hr)
>20	60 + (1/kg/hr)

Step 2: The choice of fluid is dependent the individual patient.

Consider **ISOTONIC** IVF for the following patients:

- CNS disorder, Diabetic ketoacidosis
- Patients at risk of hyponatremia: acute infection, post-operative patients and burns, Plasma Na < 138

Add K^+ to provide 1-2 mEq/kg/day, if patient has urine output

Add Dextrose to prevent hypoglycemia/ketosis (exceptions: hyperglycemia,brain injury)

Consider **HYPOTONIC** IVF for the following patients:

- Patients with an EFW deficit - e.g. hypernatremia, ongoing EFW losses (renal, GI, skin)
- Patients with established 3rd space overload - e.g CHF, nephrotic syndrome, oliguric renal failure, liver failure
- Limited renal solute handling indicated - e.g. neonatal population, hypertension

IV solution		Na (mEq/L)	K (mEq/L)	Cl (mEq/L)	% Electrolyte Free Water (EFW)*
Hypotonic	0.2% NaCl in D5W	34	0	34	78
	0.45% NaCl in D5W	77	0	77	50
	Lactated Ringers	130	4	109	16
0.9% NaCl in D5W (ISOTONIC)		154	0	154	0

*Based on a sodium plus potassium concentration in the aqueous phase of plasma of 154mEq/L, assuming that plasma is 93% water with a plasma sodium of 140 mEq/L and a potassium concentration of 4 mEq/L

Step 3: MONITORING while on IV fluid	Measure and record as accurately as possible	
Clinical status: hydration status,urine output, ongoing losses, pain, vomiting, peripheral edema, and general well-being. **Daily weights** ***Reassess TFI, indications for and fluid prescription at least every 12 hours.*** Version date : April 2011	**Fluid balance:** must be assessed at least every 12 hours Intake: All IV *and* oral intake (including medication). Ensure this matches desired TFI. Output: all losses (urine, vomiting, diarrhea etc.)	**Labs:** Serum Electrolytes - at least daily if primary source of intake remains IV, or more frequently depending on clinical course, or in the presence of documented electrolyte abnormality. Urine osmolarity/sodium and plasma osmolarity as indicated, for determining etiology of hyponatraemia.

2 bag system for DKA

	BAG A (No dextrose)			BAG B (dextrose)			
Glucose (mmol/L)	**% of IVF rate**	**mL/h** (fill in below)		**% of IVF rate**	**mL/h** (fill in below)		**Combined Dextrose Concentration**
Greater than 18.0	100%		+	0%	zero	Equals IVF rate (D) ——— mL/h	0%
15-18.0	75%			25%			2.5%
12-14.9	50%			50%			5%
9-11.9	25%			75%			7.5%
Less than 9.0	0%	zero		100%			10%

What to do as a Resident/Fellow if you learn of possible child maltreatment while working at McMaster Children's Hospital or the Ron Joyce Children's Centre

Legend
PG trainee = Resident or Fellow
HCP = Health Care Professional
MRP = Most Responsible Physician
CPA = Child Protection Agency (CAS, FACS etc)
CAAP = Child Advocacy and Assessment Program (the McMaster Child Maltreatment team)

1. You can discuss a case with the CPA without providing the child or family's name. If a report is required you will have to provide this information.

2. If, after consulting, you still feel that you should call CPA, you must do so. No one can lawfully prevent you from calling.

Understanding Your Professional Duty to Report Suspected Child Maltreatment

Neglect: Failing to ensure that one or more of a child's needs are met (e.g. nutrition, safe home environment, supervision, clothing, education) **resulting in harm or a risk of harm**. Medical neglect occurs if the child has a medical, mental or developmental condition that requires treatment and the caregiver does not ensure that the child receives the necessary care. Neglect makes no reference to what the caregiver's feelings or intentions are.

Physical Abuse: Any deliberate physical force inflicted on a child by a caregiver that results in pain, injury or creates a genuine risk of harm to the child.

Sexual Abuse: Involvement of a child in any form of sexual activity by a person with a duty of care to the child (e.g. family member, family friend, care provider).

Emotional Abuse: Repeatedly treating a child in a way that negatively impacts their sense of self-worth and self-esteem, such as repeatedly yelling, ignoring, rejecting, demeaning, isolating.

Exposure to Intimate Partner/Family Violence/Conflict: Direct and indirect exposure to violence, threats, verbal abuse etc. between people (usually adults) in the home.

Caregiver Fabricated Illness in a Child: The caregiver actively engages in behaviour which causes the child to undergo unnecessary medical care; such as by providing false information and/or directly causing symptoms in the child.

What are your reporting responsibilities as a Health Care Professional?

The law makes it clear.

Child, Youth and Family Services Act of Ontario

The duty to report applies to children 15 and under. Reporting on behalf of 16 and 17 year-olds is lawful and encouraged, but not legally required.

"Despite the provisions of any other Act" – Your duty to report supersedes all other legislation, including PHIPA

"A person who performs professional…duties with respect to children has reasonable grounds to suspect" that a child "has suffered" or "there is a risk that the child is likely to suffer" any form of maltreatment. – You don't have to be sure. You just have to have a reason to suspect that maltreatment has occurred or may occur.

"the person shall immediately report the suspicion and the information on which it is based to a society."- You have to manage with the situation when it arises.

"A person who has a duty to report…shall make the report directly to the society *and shall not rely on any other person to report on the person's behalf*" – The person who acquires the concerning information must be the person to report it to the Child Protection Agency. You must not get someone else to do it for you and nobody can lawfully compel you to do so on their behalf.

However, if a group of clinicians concludes that a report is required (e.g. a team concludes that medical neglect is occurring) one person can be delegated to make the report. This should be the person most capable of explaining the risk of harm.

"A person who has additional reasonable grounds…shall make a further report" - Every new concern must be reported, even if it happens the same day.

And,

It is unlawful for someone to use their authority to prevent you from making a report.

Please refer to the accompanying flow-chart for guidance on what to do if you become aware of possible child maltreatment while working at McMaster Children's Hospital or RJCC

Pronouncing Death

Before the Death:

Understand the patient's symptom management plan:

- Which medications/dosing to give for which symptoms

Goals of Care:

- What are the family's hopes? (ex: minimizing symptoms, promoting wakefulness)

Communication:

- Any tips about communication strategies to help support the child and family

Understand who is involved and who wants to be notified:

- This will likely include the MRP, QoLA Care and the Senior Resident/Fellow

Before Pronouncing:

Don't rush: The pronouncement does not need to occur at the exact moment death is suspected. Take time to collect your thoughts before entering the room.

Know your patient and setting: Know the name of the child and the family members. Ensure there is adequate seating. The child may be in their parent's arms.

You will need: 1) Death certificate, 2) Death notification checklist, 3) Consent for autopsy, 4) autopsy request (if applicable). These documents can be found in the pediatric ward document cabinet, PICU or NICU.

Pronouncing Death:

Introductions and expectations:

- Take time to briefly introduce yourself if this is your first time meeting the family. Explain your role and that you will be listening to the child's chest for what will seem like a long time. Plan to listen for a period of **two minutes.**

Death Pronunciation Exam:

- Listening for breathing and heartbeat is all that is needed. It is **not** necessary to check pupil reactivity, pain response or peripheral reflexes. If there is any visible respiratory effort, or an audible heart beat, then the child cannot be pronounced dead. You may then stop listening, explain there is still a heart rate and that you will listen again after some time. You can explain that it is common for a child's heart to take time to completely stop.

Language recommendations:

- Make eye contact and use a phrase like, *"Mr/Mrs (Last Name), I am sad to say that (Child's Name) has died."*
- Use the word *"died/dead."* Do not use euphemisms.

Give space:

- Tell the family you will give them some time and that you will check in with them to answer questions and discuss next steps. Some families like to have someone with them after their child has died, provide what support feels right to you.
- Ask the family if there is anyone they would like you to contact on their behalf.

Give anticipatory guidance:

- Explain the next steps and offer to answer any questions. Explain that the family can stay with the child as long as they wish. The child's body can be picked up from the hospital room by the funeral home or be picked up from the morgue. If an autopsy is planned, the child will go to the morgue.
- Ask the family about their wishes for an autopsy.
    - *"We always ask about the option of having an autopsy. This is something we offer to all families whose children have died. Not all families choose this for their child, but some do. Would you like to hear more about what this means?"*
    - If yes: "*An autopsy is usually performed in the event that the cause of death is unknown or if families want more answers about their child's death. Their organs will be examined closely by a physician specially trained to do so. The autopsy leaves a scar on the chest, which can be covered up. Some families worry that their child's autopsy will delay burial or cremation. In our experience, the delay is usually 24 to 48 hours."*
      Note: If the autopsy includes the brain, it may take longer.

After Patient Death:

Notify relevant parties:

- Must include: MRP, Next of Kin (if not present), Coroner (if meets requirements), Trillium Gift of Life
- Might include: QoLA Care (if involved), Child Protective Services (if open file), Social Work (if involved), CAAP (if involved), Chaplaincy (if requested)

Submit documentation:

- Place death certificate, death notification checklist +/- autopsy consent and request into manila folder in chart marked "*Death Documents*". These will be sent to health records.
- Complete a death dictation (see below).
- It's **strongly** encouraged to debrief with the MRP or another member of the care team. This can be after the event, or can be planned for a later date.

Death Dictation:

Use “Discharge Summary” dictation code. Copies to MRP and Family Physician.

“E.g. Admission date: (Date). Date and time of death (Date, Time). Admission diagnosis (Diagnosis). Cause of death: (use cause from death certificate). Other diagnoses at time of death: (List). Course in Hospital: (brief highlight of events surrounding admission and death). The family has been notified of the patient’s death. The death packet has been completed. Autopsy was offered to the family and the family has elected to have/not have an autopsy.”

Special Considerations:

Coroner’s Case: Must call 1-855-299-4100 if one of the following: Cause of death is uncertain, CAS has been involved in the last year, child is a ward of the state, suspected abuse or neglect

Trillium Gift of Life Network (TGL): 416-363-4001

- Call if there is currently an open file or if the family is willing to receive a call from TGL.
- Inform the family that TGL can provide more detailed information on tissue donation.

“E.g. Many families are interested in learning more about tissue donation. If you would like more information, Trillium Gift of Life will connect with you. Trillium Gift of Life is the government organization responsible for coordinating tissue donation services across the province.”

Appendix A: Sample Medical Certificate of Death

Cause of Death

11. **Part I**		I	Approximate interval between onset and death
Immediate cause of death	**(a)**	Neuroblastoma	3 years
		due to, or as a consequence of	
Antecedent causes, if any,	**(b)**		
		due to, or as a consequence of	
	(c)		
		due to, or as a consequence of	
Underlying cause of death (Stated last)	**(d)**		
Part II		II	
Other significant conditions contributing to the death but not resulting in the underlying cause given in Part I			

Cause of Death

11. **Part I**		I	Approximate interval between onset and death
Immediate cause of death	**(a)**	Aspiration Pneumonia	1 Day
		due to, or as a consequence of	
Antecedent causes, if any,	**(b)**	Cerebral Palsy	5 Years
		due to, or as a consequence of	
	(c)		
		due to, or as a consequence of	
Underlying cause of death (Stated last)	**(d)**		
Part II		II	
Other significant conditions contributing to the death but not resulting in the underlying cause given in Part I		Other diagnoses, not related to death: ex. Diabetes	

Situation

Pressure injuries are a common harm experienced by hospitalized patients. Patients with darker skin are more likely to be diagnosed with a pressure injury at a later stage (eg. Stage 3, 4, or unstageable) than patients with lighter skin.

Background

Patients with darker skin are at similar risk for pressure injuries as people with paler skin, but their injuries are usually only found at a later stage, leading to larger/deeper wounds and worse outcomes.

Health care providers are educated with resources that do not explain how to assess dark skin. Images showing normal and abnormal skin in medical textbooks and online overwhelmingly feature pale skin. Symptoms of skin problems are often taught as "erythema," "paleness," or "cyanosis" which are only visible on pale skin. Dark skin displays milder visible symptoms when the skin is deteriorating.

Health care providers need to learn the more subtle signs of damage to dark skin. Assessment of dark skin needs to go beyond a visual inspection and include palpation and assessment of pain.

When health care providers only learn to recognize problems in pale skin, we are unknowingly providing biased care that puts our patients with darker skin at risk. We all need to be aware of how to assess ALL tones of skin to provide the best care for our patients.

Assessment

Within Hamilton Health Sciences and McMaster Children's Hospital, skin tone is not currently being assessed and classified with a validated tool. There is no specific place in the existing documentation system (Epic) to record a skin tone assessment at baseline and throughout care period. Due to the lack of skin tone documentation, there is no capacity to track the incidence of hospital-acquired pressure injuries by skin colour. There are multiple skin tone assessment tools available, but some are patented which limits use.

A multidisciplinary pressure injury team at MCH have created a tool to assess dark skin tones more accurately, titled "The 4 Ts" which incorporates the modified Colour Bar Tool. The 4 Ts include tone, texture, temperature, and twinge. The 4Ts model was created for the purpose of assessing for pressure-related skin breakdown, but could potentially be used to address other skin issues such as rashes, cellulitis, and impaired peripheral blood flow.

Recommendations

The SWO team and MCH educators should update skin-related internal educational resources to include photos of dark skin at all pressure injury stages.

Wallet-sized cards explaining the 4 Ts of skin assessment should be distributed to frontline staff that regularly assess skin (eg. nurses, physiotherapy, occupational therapy, health care aides). The cards should include a skin tone assessment tool. Cards should be laminated to allow cleaning before and after bedside use.

A one-page informational resource expanding on the content of the wallet card should be distributed to units.

The 4 Ts model should be assessed and validated for both pressure injuries and other skin issues.

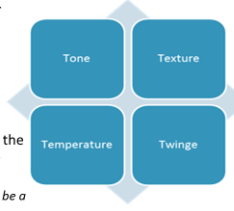
Wallet Card Content:

Use the 4 Ts to assess dark skin for early signs of pressure injury (PI)

★ **Moisturize skin before assessment. Use supplemental lighting (eg. flashlight)**

Tone: Use the Colour Bar tool (**see over**).
A change in skin tone (eg. brown to darker brown, blue or grey) may signal skin breakdown

Temperature: Palpate the skin. Is the skin warmer or cooler than nearby skin?
A change in temperature can be a warning sign for skin breakdown

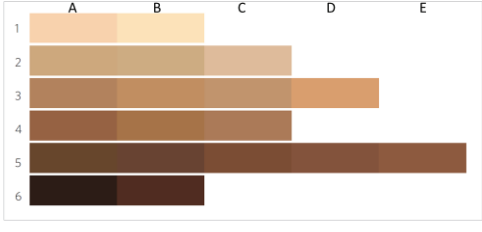


Texture: Palpate the skin. Is it shiny, taut, hardened, or boggy compared to healthy skin?
Any of the above can be signs of skin breakdown

Twinge: Assess for pain at pressure points including under medical devices.
Pain often precedes changes in skin colour

Colour Bar Tool

Adapted from Ho & Robinson, 2015



Upon admission, assess and document the skin tone of the inner forearm. During skin checks, assess skin over pressure points and compare to baseline. Redness and blanching are not easily detectable in dark skin. A change in skin colour/tone over time is concerning for skin damage.

Please note that there is currently no specific place to document the results of the Colour Bar Tool assessment in Epic. Please document as a comment under "Integumentary" in the Review of Systems or Head to Toe flowsheets.

This content represents the first phase of the initiative to improve assessment of dark skin tones. Please send any feedback on the wallet card or this one-page summary to monachino@hhsc.ca.

Dark Skin Tone Card

Developed by Rebecca Dyck, Daniela Monachino, and Charmaine Neu

Hamilton Health Sciences

March 20, 2024

Use the 4 Ts to assess dark skin for early signs of pressure injury (PI)

Hamilton Health Sciences

Moisturize skin before assessment. Use supplemental lighting (eg. flashlight)

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Temperature: Palpate the skin. Is the skin warmer or cooler than nearby skin?
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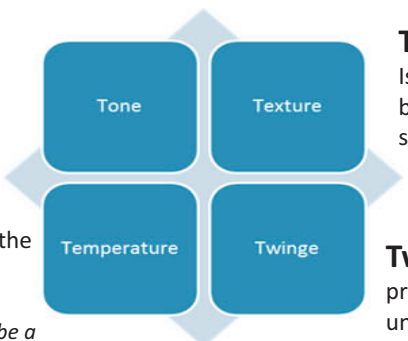

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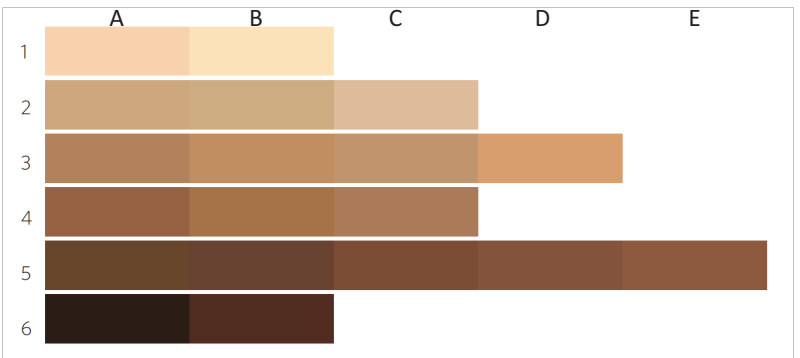

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Mandatory Infectious Diseases Consultations

As a move towards achieving accreditation goals, and quality indicators the following list of conditions has been developed to help to improve clinical outcomes for rare but severe infections.

ID consultation:
Please call ID for consultation within 24 hours for all patients with the following conditions.

Condition-based

1) Any proven meningitis or encephalitis
2) Any proven orbital cellulitis or mastoiditis with intracranial extension
3) Any suspected/proven bone or joint infection
4) Any suspected/proven necrotizing skin infection
5) Any suspected/proven endocarditis
6) Any severe pneumonia complicated by parapneumonic effusion requiring drainage
7) Fluid refractory septic shock requiring admission to PICU with >24hours of persisting end organ dysfunction
8) Severe COVID requiring medical intervention beyond dexamethasone
9) Prolonged febrile neutropenia (e.g. >7days) or when commencing antifungal therapy

Organism-based:

1) Severe *C. difficile* infection (including toxic mega colon, admission to ICU, or significant lab abnormalities)
2) *Staphylococcus aureus* bacteremia
3) Invasive Candida infection (Candidemia, Candida meningitis, Hepatosplenic candidiasis)
4) Any suspected infection with multi-drug resistant pathogens or requiring a carbapenem, such as a patient with a known current or past history of infection or colonization with: ESBL producers, multi-drug resistant Pseudomonas, septic patient worsening despite >24 hours of broad spectrum antimicrobials
5) Any suspected/proven infection requiring broad spectrum antimicrobials (carbapenems, caspofungin, amphotericin B, voriconazole, posaconazole)
6) Complex pathogens requiring specific microbiologic information
7) Any suspected/proven malaria
8) Any suspected/proven TB (tuberculosis infection)

9) Syphilis
10) Invasive Salmonella infection (e.g. meningitis, bacteremia)

Microbiology Testing Information

Please refer to EPIC Procedure Catalog

- Stool bacterial PCR+culture (Salmonella, Shigella, Campylobacter, Yersinia and Shiga toxin producing E.coli (STEC) including E.coli O157:H7)
- Stool viral PCR (Adenovirus, Rotavirus, and Norovirus 1 and 2. If you are interested in Enterovirus results this must be ordered separately)
- Respiratory virus PCR (Influenza A & B, RSV, rhino/enterovirus, parainfluenza 1 & 3, human metapneumovirus, adenovirus, and COVID-19)
    - *Mycoplasma pneumoniae* / *Chlamydia pneumoniae* can be requested as add-on test
- CSF virus PCR (HSV, VZV, enterovirus and parechovirus [< 5 years of age])
- HSV PCR (swabs, non-sterile sites, CSF, blood as indicated)
- Pleural fluid and joint fluid cultures will be automatically reflexed to PCR if culture-negative.

Microbiology Tests which require ID or Microbiologist approval:

- Bacterial CSF PCR (S. pneumoniae, N. meningitidis, H. influenzae, Listeria; for neonates, also includes Group B Streptococcus, E. coli K1)

- CMV or EBV blood PCR
- Parvovirus B19, HHV-6 PCR (referred out to SickKids)
- 16s bacterial PCR (for culture-negative sterile site infections)
- TB Quantiferon (only approved for inpatients with specific clinical scenarios)

For TB Respiratory specimens:

- *Induced sputum with 3% hypertonic saline is an option for older children; order TB culture in epic*
- *Gastric aspirates are the usual modality for young children, requires NG insertion and aspiration from 3 early morning gastric aspirates, needs to be collected into the correct media (green top container containing blue media which is available in core lab)*
- *Bronchoscopy (BAL) specimens are an alternative method*
    - *TB GeneXpertPCR-based test can be ordered on sputum or BAL specimens in consultation with microbiology*

DIAGNOSIS OF URINARY TRACT INFECTIONS IN PEDIATRICS

An appropriately collected urine sample is important for the accurate diagnosis of a urinary tract infection in children. An inadequate sample may lead to overtreatment of what is a contaminated sample, potentially overlooking the real cause of infection in a febrile infant, or failure to diagnose and treat a true urinary tract infection. **Urinalysis – Routine and Culture** is the correct EPIC Order. Culture will not be done unless the Urinalysis is abnormal.
Following a review of national and international guidelines, the following recommendations are to be followed for submitting a urine sample from children for bacteriological culture:

1. DO NOT collect urine in a urine bag, the so-called "bagged urine". These samples are associated with significant contamination of >50%. This sample source is no longer available to order and will be rejected for culture by the laboratory. Where bacterial contamination is not of concern (e.g. urine for CMV, metabolic screens), a bag urine may be appropriate. Urine collected into a "clean" cotton swab in a "clean" diaper and squeezed out is NEVER an appropriate sample to send for culture.
2. In children who are toilet trained, a "clean catch" urine can be collected. Where possible, start collecting the urine after the first few drops which will wash away any contaminants. Identify the specimen type as "Urine, Clean Catch".
3. In young infants < 6 months of age, there can be value in attempting to collect a clean catch urine sample by suprapubic cutaneous stimulation, the so-called "Bladder Stimulation/Tap", or a variation of this method, in a well hydrated infant. If a clean catch urine can be collected within 5-10 minutes of trying, this sample can be submitted, ensuring that it is identified as "clean catch". If this is unsuccessful, an "in/out catheter" sample should be collected.
4. In a child who is not toilet-trained or where collecting a timely clean catch urine is difficult, the best sample to collect is using an "in and out catheter" as this minimizes any contamination. The specimen type MUST be correctly identified as an "in and out catheter" so that the appropriate work-up can be done in the laboratory.
5. There will be occasions where there may be other sources of urine for culture, e.g. indwelling catheter, nephrostomy tube. Please ensure the correct specimen type is identified on the order.

Urinalysis is sensitive and specific for the diagnosis of urinary tract infections in children, EVEN IN YOUNG INFANTS. For most infants and children, it is recommended that urine culture is only performed when the urinalysis is positive (leukocyte esterase or nitrites). Culture, however, should be performed on children who are neutropenic, regardless of the urinalysis, and pregnant patients.
In settings where microscopy is clinically appropriate, Urine R and M can still be ordered.

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American Academy of Pediatrics. Urinary tract infection: Clinical Practice guidelines for diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics 2011;128:595-610
Labrosse M, Levy A, Autmizguine J, et al. Evaluationof a New Strategy for Clean-Catch Urine in Infants. Pediatrics.2016;138(3):e20160573
Tzimenatos L, Mahajan P, Dayan PS et al. Accuracy of the urinalysis for urinary tract infections in febrile infants 60 days and younger. Pediatrics 2018 141(2):e20173068
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ANTIBIOTIC GUIDE FOR COMMON INFECTIONS

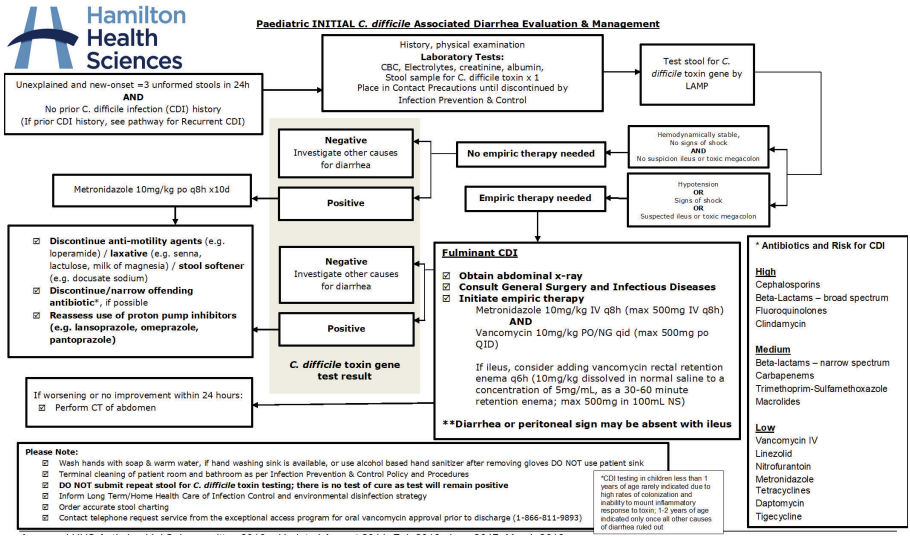
Infection	Major Organisms	Antibiotic	Duration	Notes
Otitis Media	*S. pneumoniae, H. influenzae (non-typeable), M. catarrhalis (2-20%) Group A Streptococcus (5%)*	Preferred: High-dose Amoxicillin PO (75-90mg/kg/DAY divided BID) if type 1 allergy → Clarithromycin PO if non-type 1 → Cefprozil PO OR Ceftriaxone IM OD x 3 days If initial therapy fails: Amoxicillin-Clavulanate (Clavulin) PO if type 1 allergy → call ID	10 days (age < 2, perforated, initial treatment failure, recurrent otitis media) 5 days (age >2)	watchful waiting appropriate when: - > 6mo - healthy child (NO immunodeficiency or chronic disease or anatomical abnormality of head and neck, NO Down's syndrome, NO history of complicated otitis media) - illness not severe - reliable parents *CPS statement 2016*
Mastoiditis	*S. pneumoniae, H. influenzae (non-typeable), M. catarrhalis, Group A Streptococcus, Staphylococcus aureus, less commonly anaerobes (fusobacterium)*	**Amoxicillin-clavulanate IV** if no concern about CNS infection Ceftriaxone + metronidazole **if concern about intracranial spread** (may need CNS dosing depending on extent of infection) If suspect **MRSA** (e.g. previous colonization), or if severe disease, **add vancomycin** and involve ID **Oral stepdown:** Amoxicillin-clavulanate	IV treatment until improving and source control completed (usually ~ 5-7 days), and then completion of 4 weeks total with PO Amox-clavulanate	-MUST INCLUDE CLINICAL findings of mastoiditis – postauricular tenderness, erythema, swelling (loss of crease), fluctuance/mass/fistula, protrusion of auricle (radiologic evidence of mastoid effusion alone IS NOT DIAGNOSTIC) -assess for complications of subperiosteal abscess, facial nerve palsy, hearing loss, osteomyelitis, neck abscess, intracranial complications, sinus venous thrombosis -ENT consultation
Orbital cellulitis	Group A *Streptococcus, Streptococcus pneumoniae, Staphylococcus aureus, H.influenzae, anaerobes*	**Amoxicillin-clavulanate IV** if no concern about CNS infection Ceftriaxone + metronidazole **if concern about intracranial spread** (may need CNS dosing depending on extent of infection) If suspect **MRSA** (e.g. previous colonization), or if severe disease, **add vancomycin** and involve ID **Oral stepdown**: amoxicillin clavulanic acid	Mild orbital cellulitis – usually 2-3 weeks total duration, but will depend on whether there are abscesses and/or bone or CNS involvement.	**Mandatory ID consult**
Community-acquired pneumonia	3 mo – 4 yrs *Viral >> Bacterial (S. pneumoniae,* group A Streptococcus*) >> Atypicals (Mycoplasma, Chlamydia, Legionella)* 5 – 18 yrs *S. pneumoniae,* atypicals, GAS	Outpatient or admitted to ward: -High dose Amoxicillin PO (75-90mg/kg/DAY divided TID (max 1g po TID)) or Ampicillin IV Atypical pneumonia (often seen in generally well older children): -Azithromycin PO Pleural effusion/empyema -Ampicillin IV if not getting drained -Amoxicillin/clavulanate if chest tube being inserted (pending culture and PCR) -Consider Vancomycin if history of MRSA infection in patient or family Admitted to PCCU/Necrotizing: -Ceftriaxone IM/IV + Vancomycin IV	Mild Nonsevere pneumonia (no admission required): 5 days Pneumonia requiring admission to hospital: 7-10 days Empyema/effusion: consult ID (likely weeks)	Features of atypical pneumonia: subacute onset, non-lobar infiltrate, minimal leukocytosis, older school-age - macrolides should only be considered in true anaphylactic reactions to penicillin - If you are sure it is not a type-1 reaction, can try cephalosporins (2nd or 3rd gen.) - Consider risk factors for MRSA *CPS statement 2016*

Community-acquired Meningitis in children greater than 3 months (excluding neurosurgery or immunocompromised patients)	*Bacterial (S. pneumoniae, N. meningitidis, H. influenzae), Viral (HSV, Enterovirus)* *Special considerations in:* - < 3mo - immunocompromised - known CNS disease, post-neurosurgery, trauma	Ceftriaxone IV/IM (meningitic dose, 100mg/kg/day in 2 divided doses) + Vancomycin 15mg/(kg*dose) IV q6h *above antibiotic choices may not apply to those with special considerations ADD acyclovir if any of the following: - Significant change in LOC, seizures - MR or EEG consistent with HSV - HSV PCR positive	Depends on organism: *S. pneumoniae* 10-14 days *N. meningitidis* 5-7 days *H. influenzae* 7-10days	**Mandatory ID consult** Consider DEXAMETHASONE if bacterial pathogen suspected 0.6 mg/kg/day divided q6h before or within 30 minutes of the first dose of antibiotics (only continue for 4 days if S. pneumonia or H. influenza isolated, any other pathogen discontinue) *CPS statement 2014*
Urinary Tract Infection (≥ 2 months of age)	*E. coli, Klebsiella, Enterococcus, Proteus, Serratia, Pseudomonas, Staphylococcus saprophyticus* *Acronym: KEEPPSS*	Afebrile UTI (cystitis) -Cephalexin -Trimethoprim sulfamethoxazole -IV/IM Tobramycin x1 dose Uncomplicated febrile UTI (pyelonephritis): -Cephalexin (infants) -Trimethoprim/sulfamethox. (older children) Complicated (requires admission, <2 months, hemodynamically unstable, elevated serum creatinine, poor urinary flow, abdominal or bladder mass, vomiting, clinically deteroriating after 24 hours of appropriate antibiotics, immunocompromised): -Ampicillin IV PLUS tobramycin IV	Afebrile UTI (cystitis): -5 days cephalexin -3 days trimethoprim/sulfameth. -x1 dose IV/IM tobramycin Febrile UTI (pyelonephritis): -7-10 days (consider 5 day courses in milder cases)	- Diagnosis: urine analysis and culture (will only send culture if mid-stream, catheter or suprapubic aspiration ie. NO BAG SAMPLES for culture) - UNLIKELY TO BE UTI IF URINALYSIS NORMAL in an immunocompetent patient (any age) - First febrile UTI in an infant warrants investigation with an abdominal ultrasound *AAP Clinical Practice Guideline 2011* *CPS Statement 2020*
Cellulitis	*Group A Streptococcus, S. aureus (MSSA/MRSA), Group C/G streptococcus* If pus present –likely *S. aureus* If pus not present –likely streptococcal	Preferred: 1st gen ceph. (Cephalexin PO/Cefazolin IV) If suspect MRSA (eg. abscess seen) OR severe disease: Trimethoprim/Sulfamethoxazole PO or Vancomycin IV if concerns of MRSA	Non-purulent: 5 days Abscess: generally 5-7 days after drainage Varies depending on presence of abscess and degree of drainage	- Must do I&D as first line if abscess or furuncle - Consider MRSA risk factors - Avoid oral cloxacillin if possible as it has poor bioavailability and has GI side effects *AMMI Practice Point 2022*
Bone and Joint Infection	Group *A Streptococcus, Staphylococcal aureus, Kingella kingae (particularly in pre-school age), Streptococcus pneumoniae*	Preferred: 1st gen cephalosporin (cefazolin IV) at 50mg/kg/DOSE IV q8h If suspect MRSA: Vancomycin 20mg/kg/DOSE IV q8h or 15mg/kg/dose IV q6h and involve ID	In general, for acute uncomplicated infection, Septic arthritis 2-3 weeks Acute uncomplicated osteomyelitis 3- 4 weeks	**Mandatory ID consult** *CPS Statement 2018*
***Clostridioides difficile* infection (CDI)** **See algorithm below**	*Clostridioides difficile* Mild to moderate Diarrhea BUT no systemic toxicity Severe disease Systemic toxicity +/- complications including hypotension, shock, toxic megacolon, severe colitis, ileus etc.	1st episode (mild-moderate): Metronidazole 30mg/kg/DAY PO (or IV) TID or QID 1st episode (severe +/- complications) or recurrent disease: Vancomycin 10mg/kg/DOSE QID (maximum 125mg/DOSE) *can consider rectal vancomycin if ileus present, see algorithm	General duration is 10-14 days A course of vancomycin tapering may be considered in recurrent episodes	- Always reassess need for concomitant antibiotics - Don't send stool for *C.diff* testing in children < 1 year of age - *C.diff* testing should only be done on diarrheal stool - Do not send stool for test of cure - Strongly consider ID consult for severe CDI or recurrent disease

Fever in a neonate (< 4 weeks) **(presenting from home)**	Group B Streptococcus, gram negatives (*E. coli*), Enterococcus, (Community acquired pathogens *S. aureus*, *S. pneumonia* less likely) HSV (usually before 4 weeks of age) Virus (e.g. Enterovirus)	If clinically stable and no lab concerns of meningitis: -Ampicillin + tobramycin If clinically unwell/septic: -Ampicillin + cefotaxime, consider acyclovir Suspect meningitis if (e.g. unwell, bulging fontanelle, seizures, posturing, significant lethargy) or CSF abnormalities, ensure that cefotaxime and acyclovir are given Empiric therapy: cefotaxime and reassess need for ongoing antibiotics in 24-36 hours	Duration will depend on final diagnosis	LP should be considered for neonates with fever (can risk stratify 22-28d with normal inflammatory markers) Indications for acyclovir not clear-cut. Should be given for any neonate with severe sepsis, especially if thrombocytopenia or transaminitis or coagulopathy is present, any neonate with CSF pleocytosis, or if vesicular rash. However, incidence of neonatal HSV disease low, most cases occur < 21 days. Any baby started on acyclovir requires at minimum: 1. LP for HSV PCR 2. Mouth, rectal, conjunctival, and vesicle swab for HSV PCR
Typhoid/Paratyphoid Fever	*Salmonella typhi or paratyphi* Obtain blood culture in patients with fever with no clear focus and travel in past few weeks (max incubation period is 60day), or anyone with Salmonella positive stools Most commonly associated with GI symptoms, but can be CNS, MSK, disseminated. Asess for Malaria risk in anyone with fever and travel to a malaria endemic region - send malaria smear x 2-3 seperated by 12-24hours	If clinically unwell, <3months of age, asplenic – admit and start IV Ceftriaxone pending blood culture results. If clinically well, >3months – start Azithromycin, discuss with ID and ensure followup pending sensitivity results. Recent travel to Pakistan, add azithromycin to Ceftriaxone, or use meropenem if severely unwell.	Uncomplicated typhoid/ paratyphoid fever and PO stepdown: • 7 days for azithromycin, • 7 to 14 days for cefixime, • 10 to 14 days for ceftriaxone • 14 days for amoxicillin or TMP-SMX [9].	-Stool cultures positive in 30% of patients -only use quinolones in lab confirmed sensitive strains due to rising resistance -Relapse occurs in up to 17% of cases usually within 4 weeks -Fever persists 6 to 8 days from antibiotic start, and is not a contraindication to switch to PO antibiotics -Counsel on pre travel vaccination for future

CLINICAL PEARLS

Other Clinical Scenarios:	**Challenging Organisms:**			**Antibiotics of note:**	
Septic Shock: - ceftriaxone + vancomycin - can consider pip-tazo if require coverage for anaerobes (eg. GI infection) or pseudomonas *Febrile Neutropenia:* - Piperacillin-tazobactam - Consider empiric vancomycin if previous infection/colonization with MRSA, or clinical severe sepsis - Refine Abx if blood Cx +ve - Consider previous microbiology history (e.g. antibiotic-resistant organisms) - Please note that piperacillin-tazobactam does not have reliable CNS coverage	*Pseudomonas often covered by:* - ceftazidime - piperacillin +/- tazobactam - ciprofloxacin - meropenem - aminoglycosides (gentamicin/tobramycin /amikacin)	*MRSA covered by:* - Vancomycin - Septra - Clindamycin (increasing resistance) - Linezolid (needs ID endorsement) - Doxycycline (available as PO and generally not indicated unless > 8 years) *Risk Factors:* - Previous MRSA infection or household contact - Healthcare exposure/recent hospitalization - TRAVEL (including to USA)	*Organisms resistant to penicillins and cephalosporins:* - MRSA - most CONS - ESBL - ECK (AmpC producers): *Enterobacter cloacae, Citrobacter freundii., Klebsiella aerogenes* - Atypicals - C diff Cephalosporins do not have activity against Enterococcus or Listeria	*Vancomycin (only covers gram +ve) indications:* - MRSA - Severe *C diff* infection (PO only) - CONS - *Enterococcus*	*Carbapenem indications:* - ESBL - ECK (AmpC producers): *Enterobacter cloacae, Citrobacter freundii., Klebsiella aerogenes* - Polymicrobial CNS infection **REQUIRES ID CONSULT**


Hamilton Health Sciences
Paediatric INITIAL C. difficile Associated Diarrhea Evaluation & Management
Unexplained and new-onset ≥3 unformed stools in 24h
AND
No prior C. difficile infection (CDI) history
(If prior CDI history, see pathway for Recurrent CDI)
History, physical examination
Laboratory Tests:
CBC, Electrolytes, creatinine, albumin,
Stool sample for C. difficile toxin x 1
Place in Contact Precautions until discontinued by Infection Prevention & Control
Test stool for C. difficile toxin gene by LAMP
No empiric therapy needed
Hemodynamically stable,
No signs of shock
AND
No suspicion ileus or toxic megacolon
Empiric therapy needed
Hypotension
OR
Signs of shock
OR
Suspected ileus or toxic megacolon
Negative
Investigate other causes for diarrhea
Positive
Metronidazole 10mg/kg po q8h x10d
☑ Discontinue anti-motility agents (e.g. loperamide) / laxative (e.g. senna, lactulose, milk of magnesia) / stool softener (e.g. docusate sodium)
☑ Discontinue/narrow offending antibiotic*, if possible
☑ Reassess use of proton pump inhibitors (e.g. lansoprazole, omeprazole, pantoprazole)
Negative
Investigate other causes for diarrhea
Positive
C. difficile toxin gene test result
If worsening or no improvement within 24 hours:
☑ Perform CT of abdomen
Fulminant CDI
☑ Obtain abdominal x-ray
☑ Consult General Surgery and Infectious Diseases
☑ Initiate empiric therapy
Metronidazole 10mg/kg IV q8h (max 500mg IV q8h)
AND
Vancomycin 10mg/kg PO/NG qid (max 500mg po QID)
If ileus, consider adding vancomycin rectal retention enema q6h (10mg/kg dissolved in normal saline to a concentration of 5mg/mL, as a 30-60 minute retention enema; max 500mg in 100mL NS)
**Diarrhea or peritoneal sign may be absent with ileus
* Antibiotics and Risk for CDI
High
Cephalosporins
Beta-Lactams – broad spectrum
Fluoroquinolones
Clindamycin
Medium
Beta-lactams – narrow spectrum
Carbapenems
Trimethoprim-Sulfamethoxazole
Macrolides
Low
Vancomycin IV
Linezolid
Nitrofurantoin
Metronidazole
Tetracyclines
Daptomycin
Tigecycline
Please Note:
☑ Wash hands with soap & warm water, if hand washing sink is available, or use alcohol based hand sanitizer after removing gloves DO NOT use patient sink
☑ Terminal cleaning of patient room and bathroom as per Infection Prevention & Control Policy and Procedures
☑ DO NOT submit repeat stool for C. difficile toxin testing; there is no test of cure as test will remain positive
☑ Inform Long Term/Home Health Care of Infection Control and environmental disinfection strategy
☑ Order accurate stool charting
☑ Contact telephone request service from the exceptional access program for oral vancomycin approval prior to discharge (1-866-811-9893)
*CDI testing in children less than 1 years of age rarely indicated due to high rates of colonization and inability to mount inflammatory response to toxin; 1-2 years of age indicated only once all other causes of diarrhea ruled out

Pediatric Blood Culture Guidelines

1. **AEROBIC** cultures are always drawn.
2. Does the patient require an **ANAEROBIC** culture as well?
   - ☐ **YES** if greater than 45kg
   - ☐ **YES** if less than 45 kg **AND** if any of these conditions are suspected

1. Intra-abdominal or pelvic infection
2. NEC or Intestinal perforation in a neonate
3. Necrotizing soft tissue infection (e.g. Necrotizing fasciitis)
4. Chronic oral or sinus infections with sepsis
5. Infected Bite Wound
6. Deep neck space infections (e.g. Lemierre's Syndrome)
7. Immunocompromised (e.g. Febrile neutropenic)
8. Prolonged fever of unknown origin with negative aerobic culture

Specimen Labels: Position lengthwise ensuring QR code and specimen window are not covered

For Peripheral cultures only: If patient has a Central Vascular Access Device, see instructions and chart on reverse.

Peripheral blood culture requirements:

- Find patient weight on chart below to see total volume of blood required
- Look at the appropriate section, **aerobic only** or **aerobic + anaerobic** to see how the total volume is divided. (Number of bottles, bottle colour and volume)
- Blood is collected from one peripheral poke, unless > 45kg
- If unable to obtain required blood volume, refer to min and max blood volume reference and adjust as needed
- For patients >45kg, if unable to get a 2nd site after the most proficient RN attempt, notify MRP for further direction

Min and Max Blood Volumes per Bottle Type		
Aerobic Bottles		**Anaerobic Bottle**
Yellow 1.5 – 5.0mL	Green 5.1-10mL	Orange 1 - 10 mL

Weight	Total Blood Volume	Aerobic Volume per bottle and required bottle(s)	Aerobic + Anaerobic Volume per bottle and required bottle(s)
< 5 kg	2-4 mL divided →	2 – 4mL in yellow	1.5 – 2mL in yellow 1.5 – 2mL in orange
5 – 13 kg	5-7 mL divided →	5 – 7mL (yellow if 5, otherwise green)	2.5 - 3.5mL in yellow 2.5 - 3.5mL in orange
13 – 36 kg	14-20 mL divided →	7 – 10mL in green 7 – 10mL in green	7 – 10mL in green 7 – 10mL in orange
36 – 45 kg	21-30 mL divided →	10mL in green 5 – 10mL (yellow if 5, otherwise green) 6 – 10mL in green	10 mL in green 5 – 10mL (yellow if 5, otherwise green) 6 – 10mL in orange
> 45 kg	40 mL divided →	**Aerobic and Anaerobic always drawn.** **Requires sample from 2 separate sites.**	Site 1: 10mL in green 10mL in orange Site 2: 10mL in green 10mL in orange

Minimize contamination during collection:

- Disinfect skin with chlorhexidine with a contact time of 30 seconds
- Disinfect septum of BC bottle with alcohol pad for 15 seconds
- Do not re-palpate skin

For Central and Peripheral cultures: If Patient has a Central Vascular Access Device (CVAD)

Central line (CVAD) blood culture requirements

- Cultures from CVAD **and** peripheral draw required. A peripheral culture is essential to guide management.
- If the most proficient provider has tried and is unable to obtain a peripheral culture, a second CVAD culture can be done with a new set-up
- If CVAD has multiple lumens, **all lumens** must be cultured (sometimes the bug will only be found in 1 of the lumens)
- If anaerobic culture indicated, and patient is < 45 kg, **only need 1** anaerobic sample from any site

Use chart below to determine number of sample sites, blood volumes and bottles required

- Identify **number of lumens** on CVAD, **type of culture** (aerobic **or** aerobic + anaerobic) and **weight** of patient on chart
- Draw **volume of blood** listed from **each site** indicated and place in **coloured bottle(s)** noted

Legend: **P**= Peripheral **L1**= CVAD Lumen #1 **L2**= CVAD Lumen #2 **L3**= CVAD lumen #3

Weight	Total blood volume	Single lumen CVAD		Double lumen CVAD		Triple lumen CVAD	
		Aerobic	Aerobic + Anaerobic	Aerobic	Aerobic + Anaerobic	Aerobic	Aerobic + Anaerobic
< 5 kg	2-4 mL divided →	**L1**: 1.5-2 in yellow **P**: 1.5-2 in yellow	**L1**: 1.5 in yellow 1.5 in orange **P**: 1.5 in yellow	**L1**: 1.5 in yellow **L2**: 1.5 in yellow **P**: 1.5 in yellow	**L1**: 1.5 in yellow 1 in orange **L2**: 1.5 in yellow **P**: 1.5 in yellow	Refer to Neo policy	Refer to Neo policy
5 – 13 kg	5-7 mL divided →	**L1**: 2.5-3.5 in yellow **P**: 2.5-3.5 in yellow	**L1**: 1.5-3 in yellow 2 in orange **P**: 1.5-2 in yellow	**L1**: 1.5-3 in yellow **L2**: 2 in yellow **P**: 1.5-2 in yellow	**L1**: 1.5-2 yellow 1-2 orange **L2**: 1.5yellow **P**: 1.5 yellow	**L1**: 1.5-2 yellow **L2**: 1.5-2 yellow **L3**: 1.5 yellow **P**: 1.5 yellow	**L1**: 1.5 yellow 1 orange **L2**: 1.5 yellow **L3**: 1.5yellow **P**: 1.5 yellow
13.1 – 36 kg	14-20 mL divided →	**L1**: 7-10 green **P**: 7-10 green	**L1**: 5-10 (yellow if 5, otherwise green) 5 in orange **P**: 4-5 in yellow	**L1**: 5-10 (yellow if 5, otherwise green) **L2**: 5 in yellow **P**: 4-5 in yellow	**L1**: 4-5 yellow 4-5 orange **L2**: 4-5 yellow **P**: 2-5 yellow	**L1**: 4-5 yellow **L2**: 4 -5 yellow **L3**: 4 -5 yellow **P**: 2-5 yellow	**L1**: 5 yellow 5 orange **L2**: 1.5-4 yellow **L3**: 1.5-4 yellow **P**: 1.5-2 yellow
36.1 – 45 kg	21-30 mL divided →	**L1**: 10 green 6-10 green **P**: 5-10 (yellow if 5, otherwise green)	**L1**: 10 green 6-10 orange **P**: 5-10 (yellow if 5, otherwise green)	**L1**: 10 green **L2**: 6-10 green **P**: 5-10 (yellow if 5, otherwise green)	**L1**: 6-10 green 5-10 orange **L2**: 5 yellow **P**: 5 yellow	**L1**: 6-10 green **L2**: 5-10 (yellow if 5, otherwise green) **L3**: 5 yellow **P**: 5 yellow	**L1**: 5-10 (yellow if 5, otherwise green) 5 orange **L2**: 5 yellow **L3**: 4-5 yellow **P**: 2-5 yellow
> 45 kg	40 mL divided →	**Aerobic and Anaerobic always drawn.**	**L1**: 10 green 10 orange **P**: 10 green 10 orange	**Aerobic and Anaerobic always drawn.**	**L1**: 10 green 10 orange **L2**: 10 green **P**: 5 yellow 5 orange	**Aerobic and Anaerobic always drawn.**	**L1**: 10 green 10 orange **L2**: 5 yellow **L3**: 5 yellow **P**: 5 yellow 5 orange

<table>
<tr><th colspan="4">CONSIDERATION OF MULTISYSTEM INFLAMMATORY SYNDROMES, INCLUDING MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN ASSOCIATED WITH COVID-19 (MISC-C) AND KAWASAKI DISEASE (KD)</th><th>Toxic Shock Syndrome</th></tr>
<tr><td>Clinical features</td><td>Fever >38.5 °Celsius of any duration

AND

Tachycardia, hypotension and/or oxygen requirement

AND

Evidence of multi-organ dysfunction</td><td colspan="2">Persistent fever >38.5 °Celsius for 5 days *

plus/minus

Additional Clinical Features of KD and MIS-C (See Boxes A and B)</td><td>Staph: Fever, hypotension, diffuse erythroderma, desquamation, at least 3 organ systems
No other infection confirmed

Group A Strep:
-hypotension, multiorgan involvement (renal, coagulopathy, liver, ARDS, erythematous macular rash with desquamation) with no other etiology.
-isolation of GAS from sterile site</td></tr>
<tr><td>Initial Action Steps</td><td>Consider early PICU consult

Order MIS-C Full Panel (See Box C)</td><td colspan="2">Order MIS-C Screening Blood Work (See Box D)</td><td>-send blood cultures (two sets)
-culture sterile sites of relevance (e.g. joints, wounds, CNS etc as appropriate)
-remove any source foreign bodies (e.g. tampons)</td></tr>
<tr><td>Assessment of MIS-C Screen</td><td rowspan="3"></td><td colspan="2">Are at least 2 of the following present?

1. CBC abnormalities consistent with MIS-C (e.g. neutrophilia, lymphopenia, anemia or thrombocytopenia)
2. CRP > 100
3. Ferritin > 500
4. Albumin < 30</td><td>-consider other Ddx (drug reaction, dengue, leptospirosis, enteric fever, RMSF, meningococcal, MISC, KD, sepsis)</td></tr>
<tr><td></td><td>YES</td><td>NO</td><td></td></tr>
<tr><td>Next Action Steps</td><td>Contact General Pediatrics and Rheumatology to discuss potential admission and/or further work-up</td><td>Manage as per usual care by the ED team</td><td>-initiate antibiotics Ceftriaxone empirically (if MRSA risk factors consider Vancomycin)
-in addition to Clindamycin (30-40mgkg/day IV divided q8h)

Consider IVIG in GAS TSS (1g/kg on day 1, 0.5g/kg on day 2, 3)

Consider prophylaxis for close contacts of iGAS</td></tr>
<tr><td colspan="5">* Physicians should use their clinical judgement:
• Patients with an obvious cause for their fever (e.g. Streptococcal pharyngitis or pneumonia) <u>may not require</u> MIS-C screening blood work
• Patients with less than 5 days of fever and 2 or more concerning symptoms for MIS-C (see Box A) may require screening blood work</td></tr>
</table>

Box A. Additional clinical features of Multisystem Inflammatory Syndrome in Children (MIS-C)

- Abdominal pain, diarrhea and/or vomiting
- Non-exudative conjunctivitis
- Oral mucosal changes
- Hand and foot erythema or edema
- Diffuse erythematous rash
- Headache or neck stiffness

Box B. Features that help distinguish patients with MIS-C from those with Kawasaki disease (KD)

	KD	MIS-C
Age	• Typically 1 to 5 years of age	• Often older than typical KD patients
Clinical features	• Classic KD features present o Nonpurulent conjunctivitis o Oral mucosal changes o Cervical lymphadenopathy o Rash o Peripheral edema	• Classic KD features present, but more likely to be incomplete • More respiratory and gastrointestinal symptoms • Meningeal signs may be present • More likely to have signs of cardiovascular involvement
Laboratory features	• Leukophilia • Normal/increased lymphocytes • Increased platelet counts • Mild to moderately high ferritin • Normal CK	• May have leukopenia • Lymphopenia • Thrombocytopenia • Higher ferritin levels • Elevated CK
Clinical course		• More severe disease course • More likely to have myocarditis and shock • More IVIG resistance • Increased rates of cytokine storm (e.g. secondary HLH)

Box C. MIS-C Full Panel

- CBC including differential, blood film
- CRP
- Ferritin
- Albumin
- ALT, AST, GGT, LDH, bilirubin
- Electrolytes, urea, creatinine
- Glucose
- Blood gas
- INR, PTT, fibrinogen, D-Dimer
- Triglycerides
- CK, troponin, BNP (or NT-pro-BNP)
- Consider red top tube for storage for future serological testing needs prior to giving IVIG
- Blood culture
- NPS for respiratory viruses plus SARS-CoV-2
- Urinalysis

Box D. MIS-C Screening Blood Work

- CBC including differential
- CRP
- Ferritin
- Albumin
- ALT
- Creatinine

APPENDIX A

Centers for Disease Control and Prevention Case Definition of Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with Coronavirus Disease 2019 (COVID-19)

- An individual aged <21 years presenting with fever[i], laboratory evidence of inflammation[ii], and evidence of clinically severe illness requiring hospitalization, with multisystem (≥2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); **AND**
- No alternative plausible diagnoses; **AND**
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, or antigen test; or COVID-19 exposure within the 4 weeks prior to the onset of symptoms

[i] Fever ≥38.0°C for ≥24 hours, or report of subjective fever lasting ≥24 hours

[ii] Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin

Additional comments

- *Some individuals may fulfill full or partial criteria for Kawasaki disease but should be reported if they meet the case definition for MIS-C*
- *Consider MIS-C in any pediatric death with evidence of SARS-CoV-2 infection*

Source: https://emergency.cdc.gov/han/2020/han00432.asp

APPENDIX B

World Health Organization Preliminary Case Definition of Multisystem Inflammatory Syndrome in Children and Adolescents Temporally Associated with COVID-19

Children and adolescents 0–19 years of age with fever ≥ 3 days

AND 2 of the following:

1. Rash or bilateral non-purulent conjunctivitis or muco-cutaneous inflammation signs (oral, hands or feet).
2. Hypotension or shock.
3. Features of myocardial dysfunction, pericarditis, valvulitis, or coronary abnormalities (including ECHO findings or elevated Troponin/NT-proBNP),
4. Evidence of coagulopathy (by PT, PTT, elevated d-Dimers).
5. Acute gastrointestinal problems (diarrhoea, vomiting, or abdominal pain).

AND
Elevated markers of inflammation such as ESR, C-reactive protein, or procalcitonin.

AND
No other obvious microbial cause of inflammation, including bacterial sepsis, staphylococcal or streptococcal shock syndromes.

AND
Evidence of COVID-19 **(**RT-PCR, antigen test positive), or likely contact with patients with COVID-19.

Source: https://www.who.int/news-room/commentaries/detail/multisystem-inflammatory-syndrome-in-children-and-adolescents-with-covid-19

APPENDIX C

Proposed updated definition - definitive case of MIS-C/A (Level 1 of Diagnostic Certainty)

Age < 21 years (MIS-C) OR > 21 years (MIS-A)

AND fever for ≥ 3 consecutive days

AND 2 or more of the following clinical features:

- Mucocutaneous (rash, erythema or cracking of the lips/mouth/pharynx, bilateral nonexudative conjunctivitis, erythema/edema of hands and feet)
- Gastrointestinal (abdominal pain, vomiting, diarrhea)
- Shock or hypotension
- Neurologic (altered mental status, headache, weakness, paresthesias, lethargy)

AND laboratory evidence of inflammation including any of the following:

- Elevated CRP
- Elevated ESR
- Elevated ferritin
- Elevated procalcitonin

AND 2 or more measures of disease activity:

- Elevated BNP, NT-proBNP or troponin
- Neutrophilia, lymphopenia, or thrombocytopenia
- Evidence of cardiac involvement by echocardiography (dysfunction, wall motion abnormality, coronary abnormality, valvular regurgitation, pericardial effusion, abnormal LV strain) or physical stigmata of heart failure (gallop, rales, lower extremity edema, hepatosplenomegaly, jugular venous distension)
- ECG changes consistent with myocarditis or myopericarditis (abnormal ST segments, arrhythmia, pathogenic Q waves, AV conduction delay, PR segment depression, low voltage QRS)

AND

- Laboratory confirmed SARS-CoV-2 infection
- Personal history of confirmed COVID-19 within 12 weeks
- Close contact with known COVID-19 case within 12 weeks
- Following SARS-CoV-2 vaccination

Source: Vogel TP et al. Multisystem inflammatory syndrome in children and adults (MIS-C/A): Case definition & guidelines for data collection, analysis, and presentation of immunization safety data. *Vaccine* 2021; 39:3037-49.

Reportable diseases to public health

- **Acquired Immunodeficiency Syndrome (AIDS)**
- Acute Flaccid Paralysis
- Amebiasis
- Anaplasmosis (NEW 2024)
- Anthrax
- Babesiosis (NEW 2024
- Blastomycosis
- Botulism
- Brucellosis
- Campylobacter enteritis
- Carbapenemase-producing Enterobacteriaceae (CPE), infection or colonization
- Chancroid
- **Chickenpox (Varicella)**
- **Chlamydia trachomatis infections**
- Cholera
- Clostridium difficile infection (CDI) outbreaks in public hospitals
- Creutzfeldt-Jakob Disease
- Cryptosporidiosis
- Cyclosporiasis
- Diphtheria
- Diseases caused by a novel coronavirus, including Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and coronavirus disease (COVID-19).
- Echinococcus multilocularis infection
- Encephalitis, including,
  i. Primary, viral
  ii. Post-infectious
  iii. Vaccine-related
  iv. Subacute sclerosing panencephalitis
  v. Unspecified
- Food poisoning, all causes
- Gastroenteritis, outbreaks in institutions and public hospitals
- Giardiasis, except asymptomatic cases
- **Gonorrhoea**
- **Group A Streptococcal disease, invasive**
- Group B Streptococcal disease, neonatal
- Haemophilus influenza disease, all types, invasive
- Hantavirus pulmonary syndrome
- Hemorrhagic fevers, including,
  i. Ebola virus disease
  ii. Marburg virus disease
  iii. Lassa fever, and other viral causes
- **Hepatitis A, viral**
- **Hepatitis B, viral**
- **Hepatitis C, viral**
- Influenza
- **Legionellosis**
- Leprosy
- Listeriosis
- **Lyme Disease**
- **Measles**
- Meningitis, acute,
  i. bacterial
  ii. viral
  iii. other
- **Meningococcal disease, invasive**
- **Mumps**
- Ophthalmia neonatorum
- Paralytic Shellfish Poisoning
- Paratyphoid Fever
- **Pertussis (Whooping Cough)**
- Plague
- Pneumococcal disease, invasive
- Poliomyelitis, acute
- Psittacosis/Ornithosis
- Q Fever
- **Rabies**
- Respiratory infection outbreaks in institutions and public hospitals
- Rubella
- Rubella, congenital syndrome
- Salmonellosis
- Shigellosis
- Smallpox and other orthopoxviruses, including monkeypox
- **Syphilis**
- Tetanus
- Trichinosis
- **Tuberculosis**
- Tularemia
- Typhoid Fever
- Verotoxin-producing E. coli infection, including Haemolytic Uremic Syndrome (HUS)
- **West Nile Virus Illness**
- Yersiniosis

For specifics on which diseases need to be reported immediately, same day and next business day visit:
https://www.hamilton.ca/people-programs/public-health/health-care-professionals/reporting-infectious-diseases#report-immediately

How to report:
Timely reporting can help minimize the spread of communicable diseases. If you suspect, or have confirmation of, any of the below named diseases or their etiologic agent: Contact Hamilton Public Health by phone at **905-546-2063** or by fax at 905-546-4078

Post Exposure Prophylaxis for specific pathogens:

Pathogen	Who to Prophylax	Agents of Prophylaxis	Timing
N. meningitidis	-all household contacts -shared utensils -slept in same dwelling 7d prior -anyone with contact with oral/nasal secretions -inform public health if index was on a flight in the 7d prior -specific high risk healthcare workers (EHS responsibility)	Rifampin PO x 2 days (preferred agent for all infants) (consider drug interactions for adults)- not to use in pregnancy Ceftriaxone IM x 1 Ciprofloxacin x 1 dose -Vaccinate any household contacts that are not vaccinated and eligible	Initiate within 24h after index case identified and within 2 weeks https://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/meningococcal_chapter.pdf
H. influenzae B	-household contacts if any children <4y of age in home (if not fully vaccinated) or any unvaccinated children or immune compromised child in the home -daycare contacts if incompletely immunized contacts	Rifampin x 4 days -Vaccinate any household contacts/exposed people that are not vaccinated	Initiate within 7days of index case https://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/Haemophilus_influenzae_chapter.pdf
Invasive Group A Strep	-household contacts (e.g. >4h / days or >20h/ week in the past 7days) -shared same bed -anyone with contact with oral/nasal secretions or shared needles -specific high risk healthcare workers (EHS responsibility)	Cephalexin X 10days Clarithromycin x 10days Clindamycin x 10days	Initiate within 7days of index case https://cps.ca/en/documents/position/Invasive-group-A-streptococcal-disease

PPI (Proton Pump Inhibitors) in Pediatrics – Reflux Disease – Best Evidence in Peds with Omeprazole, Lansoprazole and Pantoprazole.

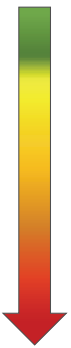
Drug Generic Name	***Brand Name***	***Pediatric Dose[1, 6]*** */BID dosing is thought to provide better control of breakthrough acid)*	***Max Dose[1]*** *(faster clearance in peds than adults – may need higher than standard adult dose)*	***Usual Adult Dose GERD[2]***	***Administration*** *(See note below)* ***Note: Pharmacy Prepared Suspension[6]*** *(Compounding dependent on pharmacy)*	***Available Formats[4] and Cost***	***LU Code [3]***
Omeprazole	Losec	1-1.5 mg/kg/day PO once daily or divided BID NEONATAL: 0.5-1.5 mg/kg/dose	3.5 mg/kg/day	10-20 mg PO OD	1.Capsule – can be opened & sprinkled on yogurt and given 2. Pharmacy prepared suspension can be used	10mg capsules– not ODB covered 20 mg cap ($0.41/cap)	293 – GERD or non erosive GERD when H_2Antags have failed 297-PUD or prevention of NSAID induced ulcers 401- treatment of GI disorders: Crohns, short Gut etc. 402-severe esophagitis, Zollinger-Ellison etc. Required for billing of suspension
Lansoprazole	Prevacid	<10 kg: 7.5 mg PO OD 10-30 kg: 15 mg PO OD >30 kg: 30 mg PO OD	1.6 mg/kg/day or 30 mg/day	15-30 mg PO OD	1.Capsules may be opened and sprinkled into applesauce 2.FasTabs can be placed on tongue for doses 15mg or greater 3. FasTabs can be split and mixed with water if no other options exist (cannot dissolve and dose) 4. Pharmacy Prepared suspension has short expiry so not made at HHS	15mg ($0.5/cap) 30mg ($0.5/cap) with Enteric coated microgranules 15, 30 mg FasTabs (not ODB covered)	For capsules only: (not FasTabs) 293 – GERD or non erosive GERD when H_2Antags have failed 295 – for HPylori Peptic Ulcer 297-PUD or prevention of NSAID induced ulcers 401- treatment of GI disorders: Crohns, short Gut etc. 402-severe esophagitis, Zollinger-Ellison etc.
Esomeprazole	Nexium	1mo-11 yrs: <5kg:2.5- 5mg PO OD >5kg: 10 mg PO OD 12-17yrs: 20 mg PO OD	40 mg/day	20-40 mg PO OD	1.Tabs can be dispersed for PO admin. Mix with 25-50mL mL of water 2. Sachet can be dissolved & administered via G tube	20 mg, 40 mg tablet ($0.36/40mg tab) 10 mg sachet for oral suspension (Not ODB covered)	NO – Not covered under ODB
Pantoprazole	Pantoloc	1-1.5 mg/kg/day	40 mg/dose	20-40 mg PO OD	Cannot be crushed	20mg- not a benefit 40 mg ($0.3/tablet)	See above (same as omeprazole)
Rabeprazole	Pariet	Greater than 10 years: 10 mg PO OD		20 mg PO OD	Cannot be crushed	10 mg ($0.12 tablet)), 20 mg ($0.24/tablet)	No LU code required

Note: Directions for opening capsules and dissolving tablets with dispersed microgranules into food or water requires that the granules must NOT be crushed or chewed for effect.

1. Hospital for Sick Children. Drug Handbook and Formulary. 2016.
2. RX Files Drug Comparison Charts. 8th Edition
3. ODB Drug Formulary
4. eCPS, 2016
5. Jew, RK et. Al. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. ASHP. 2nd Edition.
6. Micromedex . Accessed May 2017.

Prepared by N Fernandes RPh, Drug Information Centre, HHS. Reviewed by N Clarke RPh, Pediatrics MCH.

HPEWS Hamilton Pediatric Early Warning System — Escalation Protocol



Continue plan of care
• Initiate nursing directed interventions* • Within **90** minutes post intervention(s), repeat HPEWS vital signs. • If patient remains YELLOW, notify charge RN, medical team ***and*** RT if applicable
In addition to nursing directed interventions:* • NOTIFY charge RN, medical team (team resident**/fellow/NP) ***and*** RT if applicable • Within **60** minutes post interventions, repeat HPEWS vital signs. • If patient remains ORANGE, re-notify team as above
In addition to nursing directed interventions:* • NOTIFY charge RN, medical team (team resident**/fellow/NP) ***and*** activate PACE • Within **30** minutes post interventions, repeat HPEWS vital signs • If patient remains RED, re-notify team as above

***nursing directed interventions** include increased frequency of vital signs, repositioning, comfort measures, prn medications etc.

****junior residents** must review with senior resident

At any time regardless of HPEWS colour, <u>anyone</u> can notify/activate MRP team, PACE team, RT or Pediatric Code Blue

Pediatric Assessment of Critical Events (PACE)

PACE Calling Criteria

Call PACE in the following situations:

If the health care provider or family member is worried about the patient's clinical state or if any of the following criteria are present

Airway

Threatened or obstructive symptoms: stridor, excessive secretions

Breathing

Severe respiratory distress, apnea, tachypnea or cyanosis

Age	Respiratory rate/min	Hypoxemia
Term – 3 months	> 60	SaO2 < 90% in >40% FiO2
4-12 months	> 50	
1-4 years	> 40	SaO2 < 60% in > 40% FiO2
5-12 years	> 30	(cyanotic heart disease)
12 years +	> 30	

Circulation

Age	Bradycardia (beats/min)	Tachycardia (beats/min)	BP (systolic mmHg)
Term – 3 months	< 100	> 180	< 50
4-12 months	< 100	> 180	< 60
1-4 years	< 90	> 160	< 70
5-12 years	< 80	> 140	< 80
12 years +	< 60	> 130	< 90

Neurologic State

Acute change in neurologic status or convulsion

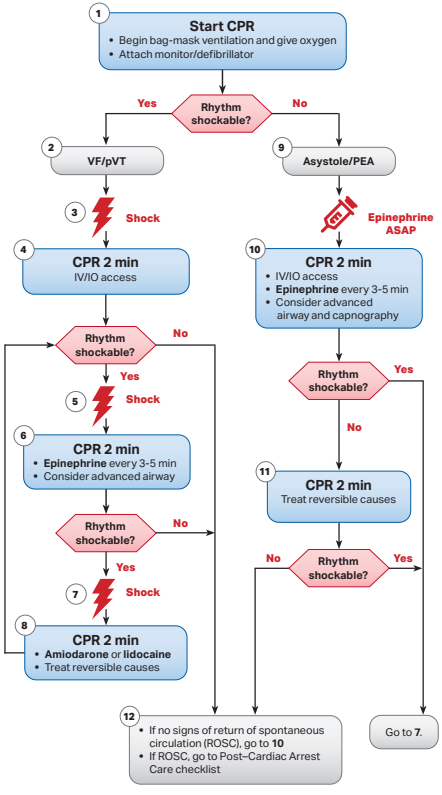
- Some of the values for respiratory rate, heart rate and blood pressure are outside the normal ranges for age: they represent concerning levels that may indicate serious illness and require expert review
- It is also important to look for worsening trends in vital signs and report these.

Call ext. 75030 and ask for PACE. We're here to help!

During the training phase, the PACE team will be available from Monday to Friday, 8 a.m. to 4 p.m.
Coming soon! On January 29th, 2007 we will begin providing 24-hour daily coverage.

Activate 'Code Blue' for all respiratory and/or cardiac arrests or other medical emergencies as per HHS policy.

Pediatric Cardiac Arrest Algorithm



CPR Quality

- Push hard (≥⅓ of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression–ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy

- **Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- **Amiodarone IV/IO dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT
  or
  Lidocaine IV/IO dose: Initial: 1 mg/kg loading dose

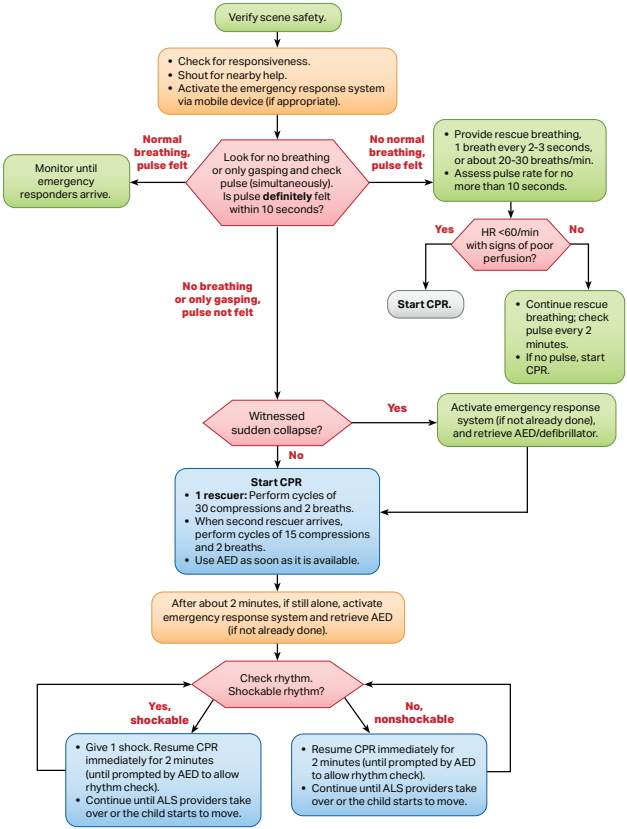
Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

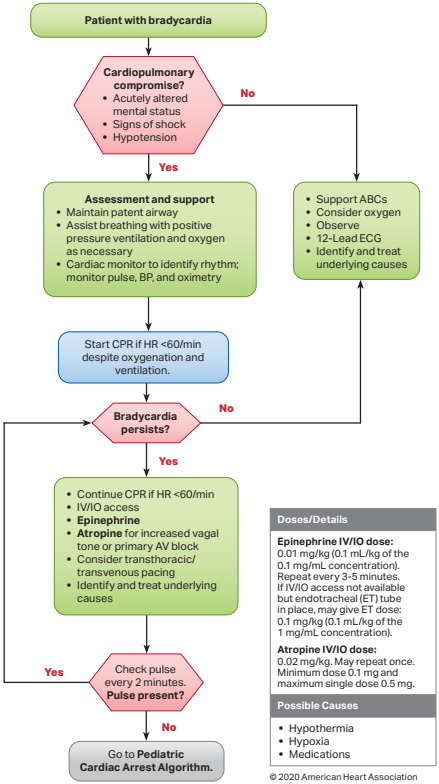
Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypoglycemia
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

Pediatric Basic Life Support Algorithm for Healthcare Providers—Single Rescuer



Pediatric Bradycardia With a Pulse Algorithm



Pediatric Tachycardia With a Pulse Algorithm