A. Care of the Hospitalized Pediatric Patient with COVID-19 Summary of changes

Date of document & version with changes	Change made as compared to previous	Rationale as applicable
1.8 December 1st, 2020	**Page 4 algorithm, page 8 and 12** Consider in collaboration with ID, the glucocorticoids as a treatment option and added change to algorithm **Page 18 Reference**	New evidence suggests change in management
1.8 January 27th, 2021	**Page 5** COVID-19 transmission occurs mainly via respiratory droplets and direct contact. It can be transmitted by aerosols under specific settings.	New evidence suggests change
	Page 4 algorithm and page 6 Fever may not be a reliable criterion of hyperinflammation in neonates. Added under both assessment for moderate and severe disease Pediatric Cardiology provided age related norms which were added to document.	Additional guidance added
	Page 7 and 11 **Fluids** are an important consideration. Oral fluids are encouraged if clinically appropriate. ***In the deteriorating patient, NG or IV fluids can be used at provider discretion.***	Slight wording change with additional guidance added
	Page 6 and page 20 MIS-C guidance document link If this is suspected even if clinically well, consult with ACH or Stollery ED or PICU and RAAPID. Please refer to Multisystem Inflammatory Syndrome guidance for Children (MIS- C) here	Needed to update and provide link
	Page 11 Added under investigations for moderate disease- inflammatory markers of CRP and ESR	New evidence suggests change
	Page 11 NIV/trach In consideration that NIV and tracheostomy care (eg suctioning) are AGMPs, refer to local policies on management of these patients if available.	Newer guidance has been provided for ACH. To keep provincial applicability refer to local policy.
	Section on learners changed to "Refer to local university guidelines"	Keep it more generic for provincial applicability
	Page 4 Algorithm and Page 10 Refer to AHS guidance for ordering a respiratory pathogen panel.	Newer guidance has been provided
	Page 16 Code Blue- Removed previous guidance and updated with provincial Code Blue Guidance link Included Pediatric wording into the Respiratory management section.	Needed to update and provide link
	Page 17 Other Guidelines- moved this section before the references and updated the other guidance available for Pediatrics **COVID Antimicrobials: Antimicrobial Management of Pediatric Hospitalized Patients with COVID-19** **Multisystem Inflammatory Syndrome in Children MIS-C:** **Care of the Pediatric Critically Ill COVID-19 Patient Annex E**	Needed to include links to these guidance documents
	Page 4 Algorithm edits made Included Cardiology under consults and under Consults page 17.	Increase visibility of consideration Cardiology

		consultation
	Moved Troponin to Second line blood work	Changes made to align areas within the document
	Changed wording under consultation for Infectious Disease: for patients with worsening disease trajectory or at MD discretion	Rationale ID consultation not mandatory for milder disease presentations.
	Changed wording for the need for ID consultation when prescribing glucocorticoids.	Rationale- ID consultation not mandatory for prescribing Glucocorticoids

COVID-19 Pediatric Inpatient guideline, Version 1.8 January13th, 2021

Care of the Hospitalized Pediatric Patient with COVID-19

The purpose of this guideline is to provide providers of inpatient pediatric care within Alberta, where pediatric refers to ages 0-18 years, guidance for the basic care of patients with known or suspected COVID-19 infection to ensure such patients receive optimal, consistent and equitable care

Please recognize that:

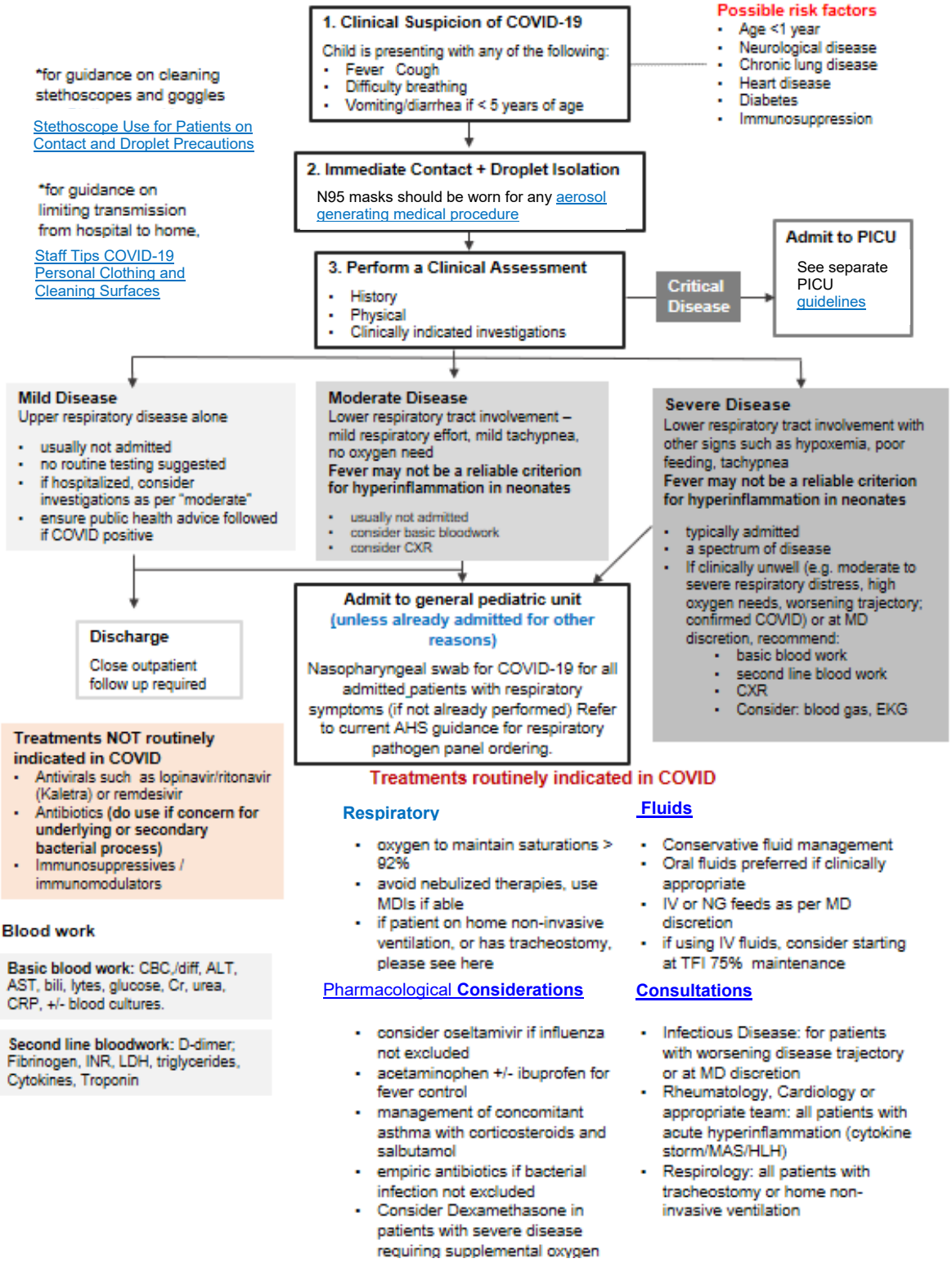
1. Application of the guidance in this document will need to be adapted to the characteristics of each individual unit, zone and department.
2. Research and guidance on COVID-19 surveillance, testing and management is being updated regularly.

This document has been developed by the Department of Pediatrics at the Alberta Children's Hospital, with input from the Sections of Hospital Pediatrics and Infectious Diseases and has been reviewed by stakeholders across the province.

This document does not provide recommendations for testing of patients with suspected COVID testing, infection prevention and control nor use of personal protective equipment as these are addressed elsewhere (links are provided).

B. Index

c. Patient Management Summary Algorithm



D. Background:

COVID-19 is the term for the clinical illness caused by the novel coronavirus SARS-CoV-2. In clinical practice the terms COVID-19, coronavirus, and SARS-CoV-2 are often used interchangeably.

COVID-19 transmission occurs mainly via respiratory droplets and direct contact. It can be transmitted by aerosols under specific settings.

Whilst most COVID-19 cases (~80%) are mild, severe disease is common, with older age being an important predictor of disease severity. Children, from the limited data we have, have milder symptomatology than adults; approximately 5% will have dyspnea and 0.6% will require PICU admission[1]. Risk factors for disease progression in children are not clear, but at this point, the following may be considered: younger age (under 1), immunocompromised and underlying comorbidities such as heart disease, lung disease, neurological disease and diabetes mellitus[2,3].

The median incubation period is around 5 days with a likely range of 2-10 days. In contrast to influenza, severe disease progresses over several days: dyspnea or hypoxemia occurs about 6 days post exposure followed by deterioration, often in the form of respiratory failure, acute respiratory distress syndrome (ARDS), and/or sepsis about 10-14 days after exposure. Recovery typically takes 2 weeks for mild disease but may take 4-6 weeks for severe disease[4].

I. SIGNS AND SYMPTOMS

Signs and symptoms are similar to those of a typical Influenza-like Illness (ILI), with fever, cough and respiratory symptoms. Of note, younger children, particularly those under 5 years of age, may present with a predominant gastrointestinal illness, with complaints of vomiting or diarrhea.

See the next page for *Table 1: Classification of Severity of COVID-19 in Children*.

Table 1: Classification of severity of COVID-19 in children:

Note there is not yet consensus on this categorization; these are based on literature to date and guidelines for experimental treatments. It is recognized these categories do not match typical severities of ILI.

Mild Disease	• Upper respiratory symptoms (e.g., pharyngeal congestion, sore throat, and fever) for a short duration or asymptomatic infection • Positive RT-PCR test for SARS-CoV-2 • May also include fatigue, myalgia, and gastrointestinal symptoms
Moderate Disease	• Clinical and/ or radiological signs of pneumonia on chest imaging • Symptoms such as fever, cough, fatigue, headache, and myalgia • No complications and manifestations related to severe conditions
Severe Disease	• Mild or moderate clinical features, plus any manifestations that suggest disease progression: o Worsening tachypnea o Hypoxemia (oxygen saturation less than 92 % on room air) o Altered level of consciousness, such as Irritability or lethargy o Dehydration, difficulty feeding, gastrointestinal dysfunction
Critical Disease	• Rapid disease progression, plus any other conditions: o Respiratory failure with need for mechanical ventilation (e.g., ARDS, persistent hypoxia despite non-invasive oxygen supplementation) o Decreased level of consciousness, depression, coma, convulsions o Myocardial injury o Elevated liver enzymes o Coagulation dysfunction, rhabdomyolysis, and any other manifestations suggesting injuries to vital organs o Septic shock o Other evidence of organ failure

It should be noted that the host's response to COVID-19 seems important. Patients with more severe disease often display immune dysregulation and high inflammatory cytokines[5], often referred to as a "cytokine storm syndrome", resulting in a macrophage activation syndrome (MAS) or hemophagocytic lymphohistiocytosis (HLH) like clinical picture. Signs of this may include cytopenias, elevated ferritin, triglycerides, LDH and d-dimer. If this is suspected even if clinically well, consult with ACH or Stollery ED or PICU and RAAPID. In some institutions consults may be any of Rheumatology, ID, Hematology, Immunology or other. Please refer to Multisystem Inflammatory Syndrome guidance for

Children (MIS- C) here

II. DIAGNOSIS:

The diagnosis is made on clinical grounds and confirmed with laboratory testing documenting presence of SARS-CoV-2; chest imaging by CXR may identify or exclude some pulmonary complications, but CT chest is not routinely recommended in children.

There are no specific physical exam findings. Hypoxemia on pulse oximetry may be the only abnormality. The remainder of the exam may be normal: crackles, wheeze, or other pathological breath sounds if present could be due to a concomitant disorder.

Investigations are non-specific. Bloodwork in adults often demonstrates lymphopenia, but this is less common in pediatrics[6]. Laboratory markers of poor prognosis in adults include more severe lymphopenia, elevated d-Dimer, elevated LDH, elevated troponin, and elevated Sequential Organ Failure Assessment (SOFA) score in adults[2]. It is unknown if these findings have prognostic implications in pediatrics. Fever may not be a reliable criterion of hyperinflammation in neonates.

Pediatric Cardiology has provided age specific norms below:

Troponin T values in healthy newborns

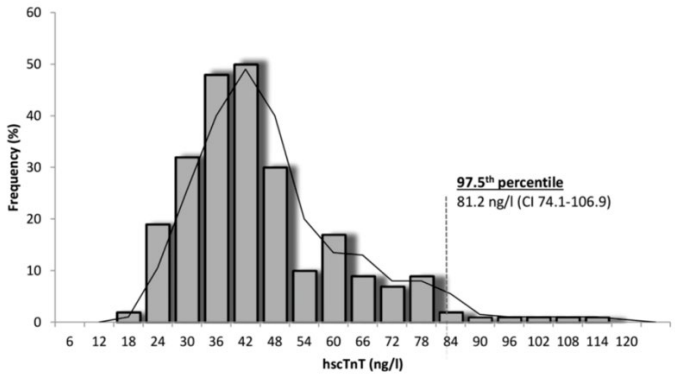
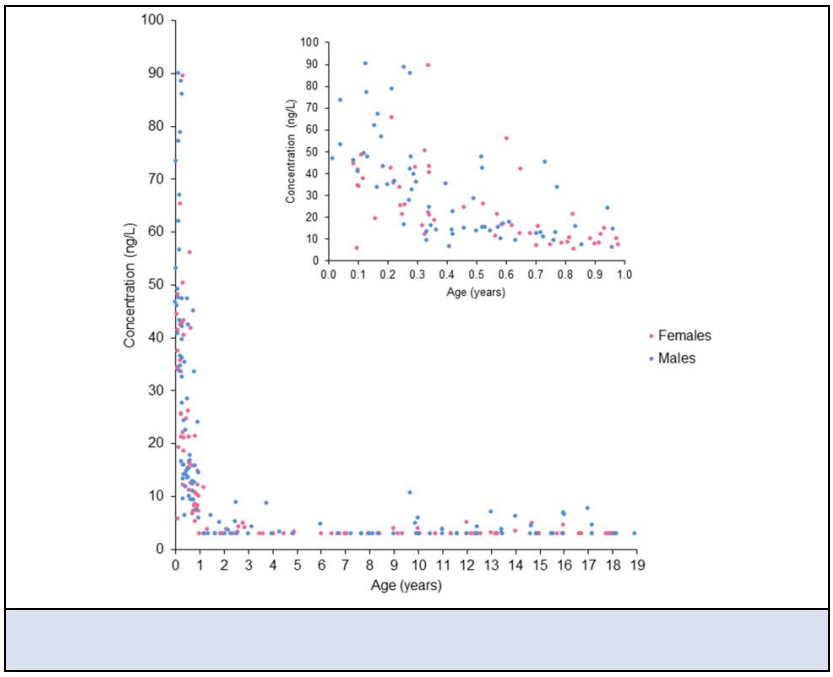


Fig. 1. Distribution of hscTnT values in healthy newborns (n=241). hscTnT, high-sensitive troponin T; CI, confidential interval.

Physiol. Res. 67: 191-195, 2

Troponin T values in pediatrics



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Lam et al. JALM. 2020:1-10.

Table 1. Pediatric reference intervals and cut-offs for high-sensitivity cardiac troponin T (hs-cTnT) and N-terminal pro-B-type natriuretic protein (NT-proBNP).

Analyte	Age range	n	Lower limit (90% CI[a]) (ng/L)	Upper limit (90% CI) (ng/L)	99th percentile Cut-off (90% CI) (ng/L)	% > 3 ng/L	% > 5 ng/L
hs-cTnT	0–<6 months	64	7 (4, 10)	78 (68, 87)	87 (76, 97)	100%	N/A
	6 months–<1 year	45	6 (5, 7)	34 (28, 42)	39 (32, 47)	100%	N/A
	1–<19 years	131	<3 (<3, <3)	9 (6, 11)	11 (11, 14)	30%	N/A
NT-proBNP	0–<1 year	211	39 (26, 57)	3569 (2188, 4876)	5272 (4788, 6937)	N/A	100%
	1–<19 years	265	<5 (<5, 7)	178 (144, 203)	216 (182, 250)	N/A	97%

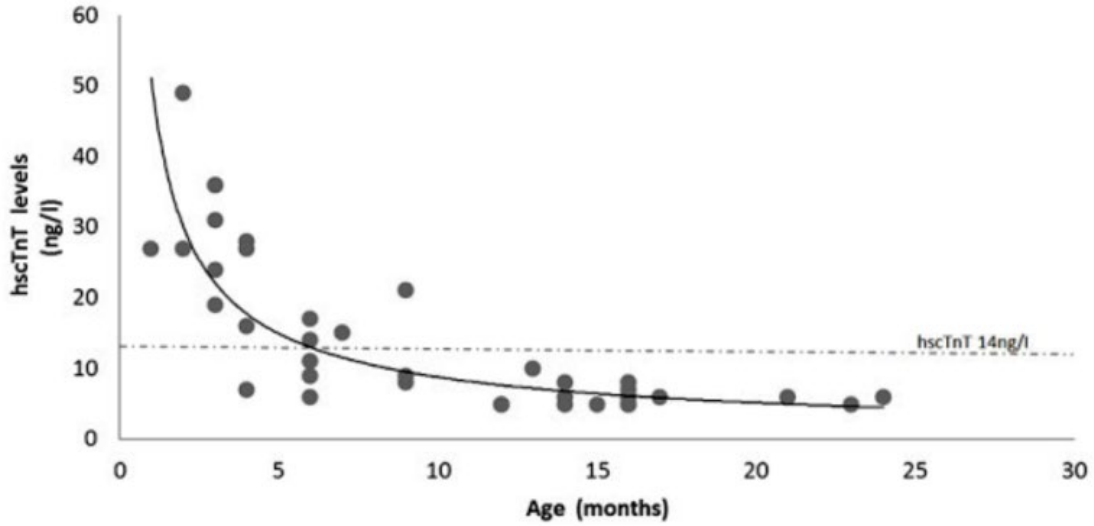
[a] CI, confidence interval.

Lam et al. JALM. 2020:1-10.

****Troponin I Normal Values for age (hsTnT, ng/L)**

Age	Median	25 – 95 %iles
2-5 days	92	54-158
Newborns <1 mos	21	12-139
Infants 1-12 mos	11	5-85
Toddlers 1-10 yrs	2.2	1.6-38

Adolescents 10-18 yrs	2	1.5-6



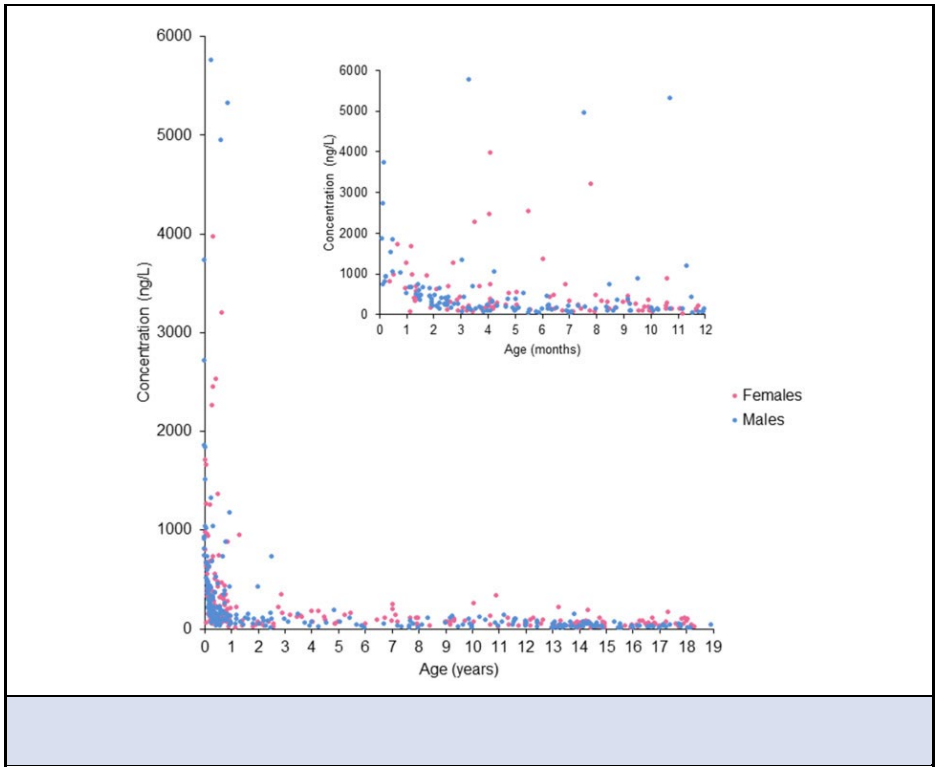
Clinica Chimica Acta. 2016;68-71.

NT-proBNP ranges for age (ng/L)

Age	Median	Range
0-2 days	3183	260-13224
Neonates <1 mo	2210	28-7250
Infants 1-12 mos	141	5-1121
1-2 yrs	129	31-657
2-6 yrs	70	5-391
6-14 yrs	52	5-391
14-18 yrs	34	5-363

*our units are ng/L. If reading other hospitals, check units, conversion factor from ng/L to pmol/L divide by 8.457

Heart Fail Rev 19:727-742, 2014



Lam et al. JALM. 2020:1-10.

Co-infection with other respiratory viruses is common[7].

Most common imaging findings (though not required for diagnosis):

A. **Chest x-rays:** bilateral peripheral infiltrates most common, but these may be subtle early in the disease. Second most common is unilateral patchiness[6].

B. **CT chest*:** bilateral infiltrates with a ground-glass pattern sometimes with crazy paving; dense consolidation can also be seen[8-10]. Progression to typical ARDS patterns is typical for severe disease.

**note: CTs are not often used in pediatrics due to risks associated with ionizing radiation*

III. TREATMENT

Treatment is generally supportive.

Experimental anti-viral medications have been used in severe and critically ill disease. Supportive evidence for these is currently under investigation, and infectious disease consultation is strongly recommended for these experimental treatments.

Strict isolation precautions in keeping with AHS IPC guidelines are to be maintained.

Fluids are an important consideration. Oral fluids are encouraged if clinically appropriate. In the deteriorating patient, NG or IV fluids can be used at provider discretion. Fluid management strategies should be in keeping with lung conservation strategies. If using IV

fluids, consider limiting total fluid intake to 75% maintenance.

Antibiotics are not required for COVID-19 treatment, but their use should be considered empirically in severe disease until underlying bacterial etiology is ruled out, or if there is concern for a secondary bacterial pneumonia.

Antibiotic choice would be those recommended by current community acquired pneumonia (CAP) guidelines with recognition that it is not yet known which organisms are most likely to complicate COVID disease. Earlier use of ceftriaxone and azithromycin could be considered, and if the patient is not improving or is progressing the addition of vancomycin as per “severe CAP” is deemed reasonable.

The role of **antiviral and immunosuppressive agents** are currently not the standard of care, however can be used in consultation with appropriate subspecialists. Oseltamivir (Tamiflu) should be considered if influenza is not excluded.

Glucocorticoids: In hospitalized patients who meet criteria for severe disease who require supplemental oxygen on inpatient units consider offering dexamethasone 0.15mg/kg (up to 6mg) or equivalent glucocorticoid IV/PO daily for 10 days, or until off oxygen or until discharge if earlier. This decision can be made in collaboration with the infectious diseases team. [22]

Glucocorticoids are not recommended in patients who do not have hypoxemia requiring supplemental oxygen. [22]

Weaning of steroids is not required for most patients who receive a 10 day course [22]

There have been multiple controversies, concerns, and experimental treatments discussed in the media. Briefly:

Controversies, Concerns and Experimental Treatments

a. **Non-steroidal anti-inflammatory drugs (NSAIDs):**

   Controversy surrounding ibuprofen in patients positive for COVID-19 came after the Health Minister of France, and later the WHO, advised against the use of ibuprofen out of concern that it may worsen COVID-19 outcomes. The theory behind this is that SARS-CoV-2 enters the lungs via the ACE2 receptor, which can be increased with ibuprofen use[11]

   However, there is no scientific evidence that establishes a link between ibuprofen, or other non-steroidal anti-inflammatory drugs (NSAIDs), and the worsening of COVID-19 symptoms per Health Canada[12]. The WHO updated their recommendation March 18, 2020 via Twitter to “Based on currently available information, WHO does not recommend against the use of ibuprofen”.

   Current advice from the Canadian Pediatric Society is that “ there is no evidence that parents and clinicians caring for children over 6 months of age with suspected COVID-19 infection should avoid the use of ibuprofen for fever control”.[13]

b. **Angiotensin-converting enzyme (ACE) inhibitors:**

   Once again, theoretical concerns were raised because SARS-CoV-2 enters the lungs via ACE2, the expression of which is increased when the renin-aldosterone system is blocked. Additionally, it is known that patients with hypertension, diabetes and cardiovascular disease are at higher risk of severe disease; often these diseases are treated with ACE inhibitors[11].

   However, there is not currently convincing evidence that patients on these

medications have a higher risk of adverse outcome from COVID-19 infection.

Currently Hypertension Canada[14] and the Canadian Cardiovascular[15] society recommend continuing ACE inhibitors and ARBs for patients stabilized on one of these medications.

If there are concerns for a specific patient situation, please discuss with the prescriber of the ACE inhibitor or ARB.

c. Antivirals

To date, there is no proven therapy for COVID-19. Experimental treatments cannot currently be routinely recommended given equivocal data on benefit and emerging data on harm.

d. Immunosuppressants / Immunomodulators

In the context of the importance of the host response to COVID-19 and worse outcomes with a hyperinflammatory cytokine release picture, the role of immunomodulators, including intravenous immunoglobulin has been considered. To date, there is no proven therapy for COVID-19. Experimental treatment use should be discussed with the appropriate subspecialty team, but cannot be routinely recommended given equivocal data on benefit.

E. Patient Management

At this time supportive and symptomatic care is the recommended treatment for patients with COVID-19 infections.

For patients presenting with an ILI where COVID-19 is one possible etiology, it is critical to recognize the high likelihood of more common viral and bacterial pathogens to underlie the patients presentation, even in the presence of exposure to COVID-19 infected individuals or relevant travel exposures. Additionally, asthma exacerbations commonly present with respiratory distress; it is not yet known how often COVID-19 is an inciting trigger. Investigations and treatments should ensure these other diagnostic probabilities are considered.

COVID-19 order sets for electronic medical records are/will be available for both Sunrise Clinical Manager (SCM) and Connect Care. Please consider using them to facilitate consistent patient care management.

I. Isolation

All patients should have contact and droplet isolation ordered, with N95 respirators utilized during aerosol generating medical procedures (AGMPs). Of note, collection of a nasopharyngeal swab, nasal suctioning, oropharyngeal suctioning and insertion of a nasopharyngeal airway are NOT considered AGMPs. There is no settling time required for AGMPs.

Patient room allocation should be considered in order from ideal to acceptable according to facility resources and potential/known need for AGMP: 1) negative pressure room with contained unshared bathroom facilities, negative pressure air handling and dedicated anteroom 2) single room, with the door closed, containing an unshared bathroom 3) a

single room with the door closed (consider use of a commode). Information on patient placement for communicable diseases is found in the AHS IPC Acute Care Resource Manual here.

Geographical cohorting of patients is encouraged.

See separate IP&C and PPE guidelines and video. Note that any additional advice and precautions for Influenza should be followed for COVID-19 as well.

Transportation of the patient should be minimized.

If transport is required, specifics can be found in Section D of the Care of the Pediatric Critically Ill COVID-19 guideline.

II. Visitors

Visitor guidelines can be found on the COVID website.

In the event that both parents are symptomatic or otherwise unable to visit, discuss with IP&C or the unit manager. In the event that a symptomatic caregiver is allowed to stay, strict isolation of that caregiver must be imposed by unit staff.

III. Investigations:

All patients admitted with a respiratory illness should have testing for COVID-19. Refer to current AHS guidance for ordering a respiratory pathogen panel. Testing processes (type of collection) as per AHS direction. If doing a nasopharyngeal swab directions on how to collect can be found here.

Further investigations are at the discretion of the treating physician. These may include some or all of those suggested below, particularly if unwell (e.g. risk factors for severe COVID-19, clinically unwell (e.g. moderate to severe respiratory distress, high oxygen needs), or worsening trajectory.

If COVID -19 is confirmed, suggestions based on disease severity include:

Mild Disease	• None typical • If hospitalized, consider those as per “moderate” disease
Moderate Disease	• Consider CXR* • Consider CBC, lytes, Cr, liver panel, LDH, ferritin, d-dimer, INR, triglycerides • Consider inflammatory markers of CRP and ESR

Severe Disease	• Recommend CXR* • Recommend CBC, lytes, glucose urea, Cr, liver panel, LDH, ferritin, CRP, d-dimer, INR, triglycerides • Consider blood cultures, blood gas, cytokine panel** • Consider troponin • Consider EKG
Critical Disease	• As per severe disease • Consider echocardiogram

**CXR should be ordered portable to minimize patient transport. Diagnostic Imaging is supportive of increased use of portable x-rays during the COVID-19 pandemic.*

***Cytokine panel includes IL-1, IL-6, IL-10, IL-18, TNF alpha, CD 163, CXCL 9, and IFN gamma. Order in consultation with rheumatology if signs of early MAS/HLH.*

A CT scan is not routinely recommended; exposes patient to radiation and though a chest CT is more sensitive than a chest X-ray, the findings do not typically alter management

IV. Supportive care:

Cardiorespiratory monitoring is recommended for all patients with severe disease who are COVID positive, or at physician discretion. Of note, in COVID-19 patients, hypoxemia may be more severe than otherwise suggested on clinical exam.

V. Respiratory care:

- Oxygen should be provided when oxygen saturation ≤92% on room air. Goal saturation while on oxygen ≥ 92%.
- If oxygen demand is increasing, **consider early referral for mechanical ventilation (PICU consultation or RAAPID call)** as patient outcomes may be superior and planned intubations are at a lower risk for infection transmission than emergent ones.
- Nebulization (an AGMP) should be restricted when possible to reduce risk of viral transmission to health care providers. If needed, please use appropriate PPE including an N95 respirator.
- The most common causes of pediatric in-hospital cardiac arrest are respiratory failure and circulatory shock. Sudden and unexpected cardiac arrest in the pediatric population is uncommon. Most children will show signs of clinical deterioration prior to the need for chest compressions, often requiring pre-arrest use of an AGMP to provide respiratory support. Healthcare providers should don full PPE (including N95) early (i.e., prior to patient collapse) in anticipation of the need for an AGMP.

  The link to provincial Code Blue Guidelines for inpatients with COVID-19 can be found here

- Inhaled medications should preferentially be delivered via MDI with spacer when the desired drug is available in MDI formulation and when the patient's clinical status can tolerate this modality.
    - If the patient is on Heated Humidified High Flow Nasal Cannula Therapy (HHFNC) or non-invasive ventilation (NIV), inhaled medications should be delivered by an inline delivery system if possible, to minimize circuit disconnects and the release of aerosolized particles. Please discuss options with unit Respiratory Therapists
    - If patient is on HHFNC an MDI may be delivered with the HHFNC apparatus in situ.
    - Most patients on NIV on the inpatient unit generally have time off the equipment. Medications needing to be delivered by MDIs should be ordered such that they are delivered when patients are off NIV if possible. If there are challenges with this, please discuss with the unit Respiratory Therapy to determine best method of delivery.
- **Heated humidified high flow nasal cannula therapy (HHFNC):**
    - Aerosolization of respiratory secretions may result from HHFNC therapy devices. As such, it **should be avoided** when possible for routine use in patients where COVID-19 is suspected or confirmed. If used in pediatric patients with suspected or confirmed COVID-19 infection, treatment must be at minimum performed in a single patient room with the door closed and with staff using aerosol PPE precautions including use of N95 respirators.
    - HHFNC treatment may be required to manage sick patients not meeting criteria for intubation and mechanical ventilation in non-COVID cases. Current practice and use of HHFNC will not be restricted in this population.
- **Non-Invasive Ventilation (CPAP or BIPAP):**
    - Non-invasive positive pressure ventilation (NIV) may result in aerosolization of respiratory secretions and thus is not recommended for routine use in patients with suspected or confirmed COVID-19.
    - Patients will be admitted with confirmed or suspected COVID-19 who use home nocturnal NIV at baseline. In some of these cases, consideration may be given as to whether the patient could tolerate coming off usual home NIV for the duration of the admission (i.e. on NIV for mild OSA). Respirology consultation recommended to help with this decision-making.
    - NIV treatment must be at minimum performed in a single patient room with the door closed and with staff using aerosol PPE precautions including use of N95 respirators.
    - Where possible, please consider admitting patients on home NIV to an ICU setting where full face masks, and filtered circuits can be used to mitigate AGMP exposure.

- **Patients with tracheostomy (with or without ventilator)**

Tracheostomy care is considered an AGMP. The following guidance is advised:

- Care should take place to deliver care in at minimum a single patient room using appropriate PPE, including an N95 respirator. Surgical masks are appropriate if influenza and COVID have been ruled out.
- If available, patients with a tracheostomy (with or without a ventilator) may be preferentially admitted to a PICU-setting where they may be placed on a closed ventilator circuit and supported with inline suctioning.
- If patient is not admitted to the PICU, tracheostomy tubes will NOT be routinely changed to cuffed trachs upon admission to the inpatient unit
- If patient is not admitted to the PICU, provide cold nebulized/trach cradle as indicated and per current practice
- Bronchodilator delivery should be provided via MDI and spacer. Nebulized medications should avoided.
- If the patient is on a ventilator, minimize disconnects by using inline devices where possible. Please discuss with the unit Respiratory Therapist
- As NIV and tracheostomy care (e.g. suctioning) are AGMPs, refer to local policies on management of these patients.
- **If any increased respiratory support is required, consult PICU (RAAPID if at a center without PICU) for admission.**
- Respirology consultation recommended

VI. Fluids

Oral fluids should be considered for less severe cases. In the deteriorating patient, NG or IV fluids can be used at provider discretion and use of lung conservation strategies are recommended as per Section III Treatment above

VII. Analgesics/antipyretics:

Acetaminophen and/or ibuprofen as needed.

VIII. Antimicrobials:

Oseltamivir (Tamiflu) should be considered if influenza has not been excluded.

Antibiotics, though not required for COVID-19 treatment, should be considered empirically in severe disease until underlying bacterial etiology is ruled out, or if there is concern for a secondary bacterial pneumonia. Further details in Section C III above.

IX. Glucocorticoids

In hospitalized patients who meet criteria for severe disease and are requiring supplemental oxygen, glucocorticoids can be considered as per section C III above. [22]

Glucocorticoids are not recommended in patients who do not have hypoxemia requiring supplemental oxygen. [22]

X. Consultations and Specific therapies for COVID-19:

As above, supportive care is the mainstay of COVID-19 treatment. To date, there is no proven therapy for COVID-19. Experimental treatments cannot be routinely recommended given equivocal data on benefit and emerging data on harm.

A PICU/RAAPID consultation is recommended for all patients with critical disease or those who are rapidly deteriorating. Earlier consultation is at the discretion of the treating physician with considerations of risk factors and patient trajectory.

Consultation with Pediatric Infectious Diseases is also recommended for critical and rapidly deteriorating patients. This consultation may be facilitated by RAAPID for Regional and community partners. If clinical trials for treatment of COVID-19 require earlier consultation, these criteria will be amended.

A referral to appropriate local teams (ex. Rheumatology, Cardiology) is recommended for patients with COVID-19 who demonstrate early signs of cytokine storm. These may include the presence of cytopenias, elevated ferritin, triglycerides, LDH, d-dimer and Troponin.

XI. Discharge:

Discharge criteria to consider:

- Afebrile > 24h
- No to mild respiratory distress
- No oxygen needed to maintain O2 saturations ≥92% (for COVID-19 positive patients; for other diagnoses/ viral illnesses refer to existing guidelines e.g. bronchiolitis)
- Maintaining hydration orally
- Not expecting worsening of symptoms based on illness progression and time course
- The family has been educated on appropriate actions to take should their child deteriorate after discharge

Provide the family with any or all of these resources/information:

- Alberta Health Services on Caring for a COVID-19 patient at home (available in multiple languages)
- Discharge pamphlet (in development)
- Any ongoing isolation requirements
- If in the Calgary area and in-person follow up is required, please preferentially refer to ACH Follow-Up clinic as outpatient pediatrician/family medicine offices may not have sufficient PPE

F. Medical Trainees/Learners

Refer to local university/ training institution guidelines for COVID-19 related patient care.

G. Code Blue

The link to provincial Code Blue Guidelines for inpatients with COVID-19 can be found here

Individual institutions may develop guidelines specific to their local context. Please refer to your local guideline if available.

The guideline for the Care of the Critically Ill Pediatric Patient can be found here.

H. Helpful Links:

General COVID info

- AHS COVID website (https://insite.albertahealthservices.ca/Tools/Page24291.aspx)
- COVID-19 FAQ for clinicians (https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-ncov-2019-staff-faq.pdf)
- PHAC interim guidance (https://www.ammi.ca/Content/Clinical%20Care%20COVID-19%20Guidance%20FINAL%20April2%20ENGLISH%281%29.pdf)

IP&C general

- IP&C (https://www.albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-emerging-issues-ncov.pdf)
- Policy on visitors (https://www.albertahealthservices.ca/topics/Page17001.aspx)
- PPE (advice for influenza applies to COVID-19)
- PPE video (https://ahamms01.https.internapcdn.net/ahamms01/Content/AHS_Website/Information_For/if-hp-ipc-donning-and-doffing.mp4)

IP&C for staff

- How to protect yourself at home (https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-staff-tips-cloth-clean-z0-info-sht.pdf)
- How to clean a stethoscope (https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-stescope-cont-drop-prec-z0-info-sht.pdf)

For community

- Self-isolation (https://www.alberta.ca/self-isolation.aspx)
- Physical distancing (https://www.albertahealthservices.ca/topics/Page16997.aspx#social

- PHAC https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/interim-guidance-cases-contacts.html

Other

- Spectrum app (https://spectrum.app/)
  A mobile app customized to deliver local antimicrobial stewardship guidelines, resistance data, dosing information, and AHS COVID-19 related content
- Don't forget the bubbles (https://dontforgetthebubbles.com/evidence-summary-paediatric-covid-19-literature/)
  A website with pediatric COVID-19 studies compiled

I. Other guidelines:

- **COVID Antimicrobials: Antimicrobial Management of Pediatric Hospitalized Patients with COVID-19**
  https://insite.albertahealthservices.ca/main/assets/tls/ep/tls-ep-recommendations-for-antimicrobial-management-covid-19-pediatric.pdf
- **Multisystem Inflammatory Syndrome in Children MIS-C:**
  https://insite.albertahealthservices.ca/main/assets/tls/ep/tls-ep-covid-19-mis-c-care-guide.pdf
- **Care of the Pediatric Critically Ill COVID-19 Patient Annex E**
  https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-care-pedatric-critically-ill.pdf

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