

# Pediatric Critical Care Resource Allocation Framework

SHA ETHICS DEPARTMENT

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# A. Ethical Principles

When a public health emergency occurs, ethical focus shifts from medical ethics to public health ethics. Public health's focus is on promoting societal benefits, the pursuit of the collective good and equity promoted at the population level. When demand exceeds supply, decisions must be made about how to allocate scarce resources (e.g. staff, equipment, supplies). The health system's response will be critical in minimizing loss of life. The SHA *Ethics Framework for Pandemic Response*<sup>1</sup> provides planners with guidance on well-recognized ethical principles and outlines systematic approaches to decision making.

A number of core ethical principles should guide decision making during the COVID-19 pandemic. These include the same values that guide SHA's normal operations and planning<sup>2</sup> and SHA's *Ethics Framework for Pandemic Response*.<sup>1</sup>

## **Respect and Fairness**

- ✓ Everyone matters.
- ✓ Everyone matters equally, but may not necessarily be treated the same.
- ✓ The interests of each person are the concern of all of us and of society.
- ✓ The harm that might be suffered by every person matters, and so it is essential to minimize the harm that a pandemic might cause.

The principle of fairness requires that burdens are not borne disproportionately by any patient, patient group, health sector, or institution.<sup>2</sup>

Fairness requires that decision-making processes follow procedural justice, i.e., there are established processes for decision-making. We respect our patients and the public by sharing information with them and by providing them an opportunity to participate, reflect and engage. We respect patients by following their treatment preferences as outlined in advance care directives, and addressing concerns about power imbalances.

## **Good decision-making**

Good decision-making processes are transparent, inclusive, reasonable, responsive and proportional and ensure accountability. People should be aware of the decisions made and the choices yet to make. They should know that fair decision-making processes will take into account scientific evidence, ethical principles, and address conflicts of interest, loyalty and obligation.<sup>3</sup> Decision-makers must be able to provide reasons for the choices made. Ensure decisions are made based on reasons (e.g., principles, evidence) that "fair-minded" people can agree on.

## **Solidarity**

Pandemics require society to embrace a shared commitment to the well-being of patients regardless of care setting or geographic location. Establish and encourage open lines of communication and coordination amongst health professionals, health institutions, health sectors and the public. In so far as practical and appropriate, share resources across sectors and institutions with an emphasis on collaboration and the common good.

## **B. Resource Allocation**<sup>4</sup>

During a pandemic, ethical principles must be broadened. For example, the principle of beneficence requires us to not only consider the wellbeing of the individual, but of society (“common good”). The consequentialist calculus of providing the greatest good to the greatest number is used to determine resource allocation and to limit citizens’ liberty rights to limit the spread of the virus. Benefit is often defined as saving the most lives. Available resources must be used responsibly; ensuring decisions are consistent with available evidence of clinical efficacy. Access to care should be prioritized based on urgency, severity of need, and likelihood of survival. Resource utilization should be monitored to ensure the fairest distribution possible, with mid-course corrections as needed.

Even during a state of emergency or national crisis, access to care must still be aligned with the SHA’s mission, vision, and values. This does not mean scarce resources cannot be rationed, but that rationing should be applied to all and triage principles should not uniformly deny treatment to any group or individual based on characteristics that are not clinically relevant (e.g. disability).

Denial of treatment during a crisis may cause moral distress as providers are not trained to, or may have never been asked to, deny treatment or services. In a pandemic situation, patients who would usually receive critical care may no longer be eligible (e.g. ventilator support, medications). Moral distress occurs because health care providers are now asked to participate in the process of bedside rationing, which is a new, unfamiliar function. To reduce moral distress pandemic planners should develop processes to reduce or eliminate bedside rationing. In the COVID-19 response, this will include the use of triage committees to help make allocation decisions.<sup>4</sup>

Patients who are not going to receive ICU level of care must receive compassionate care. We must never abandon the sick and dying. If a patient is not expected to survive, steps must be taken to mitigate their pain and suffering; comfort care must be provided. Given the risk of exposure and limited PPE, meeting the psychosocial needs of the dying and their families may be challenging, but visitation should be allowed whenever possible.

### **Allocation Principles**

#### **Inclusive**

The *Pediatric Critical Care Resource Allocation Framework* (Pediatric Framework) applies to all pediatric (18 less a day old) patients requiring ICU care in Saskatchewan, not just those who test positive for COVID-19.

#### **Proportional**

The *Pediatric Framework* incorporates an approach to rationing critical care resources that is both proportional and responsive to the pandemic state and demand for pediatric resources. Evidence to date suggests that approximately 1-10% of COVID-19 cases are in children. Children of all ages appear to be susceptible and sex has not been identified as a risk factor. Children tend to have mild infections, with a substantial portion being asymptomatic. This means the pediatric prevalence of COVID-19 may be difficult to determine, and is likely to be underestimated. Although rare, there are reports of severe illness in children with some requiring mechanical ventilation. Deaths have been reported. Large studies in both China and the United States suggest severe and critical outcomes may be more common in children under the age of one and those with underlying

medical conditions. Recent media reports have described a number of clusters of Kawasaki Disease-like illness in children. The association between this illness and COVID-19 is at present unclear, but requires further investigation.<sup>5</sup>

## Equity

As children tend to have mild infections, the possibility of critical shortages due to COVID-19 appears unlikely. In comparison, critical shortages of adult resources may occur and allocation plans include surging adult patients into PICU, with capacity as detailed:

Jim Pattison Children's Hospital has 52 beds for maternal and pediatric care to meet provincial needs – both COVID-19, and non-COVID patients.

- PICU: 12 regular beds, can flex up to 24 beds.
- NICU can manage infants if PICU beds become limited.
- The PICU would be able to support all maternal ICU and ideally non-COVID adults up to 30 years of age, growing to 40 years of age without co-morbidities as needed.<sup>6</sup>

Recognizing the physiologic and management differences between children and adults, and that some pediatric ventilators are unable to support adults, the critical care resources in the PICU should be prioritized for infants and children. If, however, adolescent cases surge, reciprocity dictates that, if necessary and efficacious, children should have access to adult critical care resources.

In the event of limited or scarce resources objective criteria should be used to allocate beds. The first criterion used should be physiologic assessments and identifying patients whose outcome would be fatal if ICU care is denied, but likely to survive to discharge if they receive ICU care. (See Appendix 3).

Patients with an equal chance of benefiting from health resources should have an equal chance at receiving the resource. If a situation arises where two or more people are eligible for a limited or scarce resource, e.g., ventilator, there should be agreed-upon tie-breaking criteria. Tiebreakers should be determined through broad consultation and based on criteria generally accepted by society. Four generally accepted tiebreakers are timing (first come, first served), the life cycle principle, value of the social role (not applicable in pediatrics), and random selection.

With COVID-19, children tend to have mild symptoms. It is unlikely pediatric critical care resources will become limited or scarce due to high pediatric demand. The most appropriate tiebreakers for two pediatric patients would be first come, first served and random allocation. If pediatric resources become limited or scarce because adults have been surged into PICU and a pediatric patient and an adult have an equal chance of benefiting from critical care, the most appropriate tiebreaker would be life-cycle principle.

The goal of the life cycle (or intergenerational equity) principle is to give each individual equal opportunity to live through the various phases of life. An adult has lived through more stages than a child has. However, age alone does not disqualify a patient for access to limited resources. A number of factors are taken into account,

such as underlying health factors and likelihood of recovery. Considering a pregnant patient and her fetus as two separate lives, also leads us to consider prioritization of such patients.

### **C. Overarching Thoughts**

1. SOFA scoring system is for adults only.
2. PELOD-2 is a scoring system for pediatrics, but has not been validated with COVID-19. Thus, any dialogue between a critically ill adult and child will be guided by a validated and objective adult score and a subjective pediatric assessment.
3. A pandemic may be adult skewed, suggesting that pediatric resources may be considered for adult patients.
4. A pandemic may be pediatric skewed, suggesting that adult resources may be considered for pediatric patients.

Emergency department triage scoring systems such as CTAS also have a pediatric equivalent (PedCTAS), but their primary role is to prioritize patient care requirements. Holt, Prodanuk and Hansen report a PedCTAS score of 1 is a strong predictor for a PICU admission, but other outcomes were not measured.<sup>7-8</sup> (See Figure 2)

This suggests the importance of initiating conversations with adult providers.

### **D. Considerations for Critically Ill Patients**

Scoring systems for critically ill pediatric patients have been validated for benchmarking PICUs and/or specific illness. PELOD-2 has been validated in children with multi-organ dysfunction, but its use is not ubiquitous. PELOD-2 has not been validated with COVID. However, because it is a descriptive scoring system for organ dysfunction (particularly in the setting of infection), it is the best alternative. The Royal College of Paediatric and Child Health<sup>9</sup> has proposed the following triage factors:

#### ***Urgency***

High – high risk (e.g. >80%) of dying or of suffering serious harm if patient does not receive treatment in the near future.

Moderate – moderate risk (e.g. 30-70%) of dying or of suffering serious harm if patient does not receive treatment in the near future.

Low – low risk (e.g. <20%) of dying or of suffering serious harm if patient does not receive treatment in the near future.

#### ***Survival***

High – patient has a high chance (e.g. >80%) of survival if provided with treatment.

Moderate – patient has a moderate chance (e.g. 30-70%) of survival if provided with treatment.

Low – patient has a low chance (e.g. <20%) of survival if provided with treatment.

Palliative - patient who will not receive critical care services due to a poor prognosis despite ICU care and may be appropriate to continue supportive medical care, community based care.

**Likelihood of rapid benefit**

High – patient has a high probability (e.g. >80%) of requiring only a short duration of support (i.e. intensive care admission) if provided with treatment

Moderate – patient has a moderate probability (e.g. 30-70%) of requiring only short duration support if provided with treatment

Low – patient has a low probability (e.g. <20%) of requiring short duration of support if provided with treatment (i.e. prolonged duration is likely)

Adapted from The Royal College of Paediatric and Child Health.<sup>9</sup>

<p><b>Highest priority</b></p> <p>Patients who have a high urgency for treatment, high chance of survival and unlikely to require prolonged support should receive first priority for treatment. Patients who fall into a moderate priority category in one triage factor (e.g. survival chance), but are in a ‘high priority’ category for others (e.g. urgency/requirement for prolonged treatment) may also be high priority.</p>
<p><b>Moderate priority</b></p> <p>Patients who fall in a moderate risk for two or more triage factors would have a moderate priority for treatment. Patients with one ‘low risk’ triage factor may also be classified as a moderate priority for treatment</p>
<p><b>Lower priority</b></p> <p>Patients who have a low urgency for treatment, low chance of survival and/or low probability of needing short durations of treatment would fall into a lower priority for treatment</p>
<p><b>Palliative</b></p> <p>Patients who will not receive critical care services due to a poor prognosis despite ICU care and may be appropriate to continue supportive medical care, community based care</p>

## **E. Triage**

### **Triaging in Rural, Remote and Isolated Centers**

In rural, remote and isolated centers, critically ill adult and pediatric patients may simultaneously require resources that are finite or singular [ventilator, provider to bag ventilate, transport assets (ground, fixed wing, HEMS)]. Allocation of these resources at these sites may be the most important determinant of outcomes.

Neonatologists at the Jim Pattison Children's Hospital have agreed to be the first surge option for children requiring critical care. With capabilities of conventional mechanical and JET ventilation to young children under 5 kg, the NICU have the equipment, experience and expertise to accommodate initial surge demands.

Following basic inclusion criteria, pediatric patients can be prioritized using an appropriate metabolic organ failure assessment tool for the pediatric patient population. The scores are tabulated and coupled with the most current clinical assessment information available. The patients will be prioritized in conjunction with the Urgency, Survival and Benefit rating scales, PELOD-2 and PedCTAS Scores.

#### **Assessment Criteria**

The following assessment criteria (inclusion/exclusion) is adapted from British Columbia. *Emergency Triage in a Pandemic: Ventilator Allocation Framework*.<sup>10</sup>

**Inclusion Criteria:** Identifies those pediatric patients whose urgent clinical needs will likely benefit from intensive care services.

- **Ventilation Support:** Those patients with significant hypoxemia, inability to protect or maintain their airway, sustained decreased level of consciousness, impending respiratory failure and/or marked respiratory acidosis.
- **Refractory Hypotension:** Those patients with refractory hypotension, clinical evidence of impending shock and/or significant end organ compromise or failure due to hypo perfusion.
- **Other Clinical Indices:** As determined at the clinical discretion of the attending MD while applying principles of reason (including decisions based on facts), fairness and transparency.

#### **Exclusion Criteria:**

The exclusionary clinical conditions can be considered alone or in combination. There are absolute and relative exclusionary criteria. Those who meet absolute criteria are excluded from ICU admission and are treated conservatively or referred for palliative care services.

#### **Absolute Exclusion:**

- Have a low chance of positive response or survival to treatment
- Known DNR (Do Not Resuscitate) order
- Known incurable malignant disease
- Irreversible end stage organ failure with no options of treatment
- Severe and irreversible neurologic event or conditions with ongoing coma or Glasgow Coma Scale <5
- Cardiac arrest not responsive to full Pediatric Advanced Life Support (PALS) or Basic Life Support (BLS) efforts
- Lethal chromosomal/genetic disorders

**Relative Exclusion:** *May* include any of the following conditions:

- Severe complex trauma
- Severe immunocompromised
- Severe burn with > 30% total body surface area third degree level
- Complex multi-system disorders with extremely high medical need (e.g.: multi-organ transplant)
- Chronic conditions with known or predicted mortality (e.g. certain congenital heart defects, late stage neuromuscular conditions requiring chronic life support)

## **F. Sensitive Trigger Points**

For difficult discussions to ensue between adult and pediatric providers regarding finite resources, trust, familiarity and respect must be established. As the COVID-19 pandemic is adult skewed, there should be trigger points that initiate the involvement of pediatric partners in triage discussions.

The *Critical Care Resource Allocation Framework*<sup>4</sup> and the *Pediatric Framework* incorporates an approach to rationing critical care resources that is both proportional and responsive to the pandemic state. Therefore, resource allocation criteria become increasingly selective as baseline funded ICU capacity is increasingly exceeded. Baseline funded Adult ICU capacity is defined as 79 adult critical care beds in Saskatchewan (see Table 3 for distribution). Baseline funded PICU capacity is 12 critical care beds.

Adult Critical Care Triage Stages are defined as follows:

- Critical care triage Stage 1: 91 – 125% of baseline ICU capacity occupied (51 – 70 beds in Regina/Saskatoon)
- Critical care triage Stage 2: 126 – 140% of baseline ICU capacity occupied (71 – 78 beds in Regina/Saskatoon)
- Critical care triage Stage 3: 141 – 175% of baseline ICU capacity occupied (79 – 98 beds in Regina/Saskatoon)
- Critical care triage Stage 4: >175% of baseline ICU capacity occupied (98+ beds in Regina/Saskatoon)

Pediatric Critical Triage Stages are:

- Critical Care Triage Stage 1: 80-100% of baseline PICU capacity occupied
- Critical Care Triage Stage 2: 100-120% of baseline PICU capacity occupied
- Critical Care Triage Stage 3: 120-150% of baseline PICU capacity occupied
- Critical Care Triage Stage 4: Greater than 150% of PICU capacity occupied.

## **G. Coordination and Activation**

The Saskatchewan Health Authority will establish a System Flow Coordination Centre, which will have the ability to track critical care and non-critical care hospital utilization, location of available critical care and non-critical care beds, and COVID-19 cases across Saskatchewan. This centralized dashboard of information will facilitate patient flow and thus allow for equitable access to the needed resources across the province. Based on this data, an attempt should be made to balance hospital utilization across the province by directing transfers to centers that are less utilized, if the patient's needs can be met in these centers. The Pediatric



Transport Physician (TP) at the Jim Pattison Children’s Hospital should remotely support clinicians in the care of critically ill pediatric patients in smaller centers.

The *Critical Care Resource Allocation Framework* will be activated upon a declaration by the Chief Medical Officer of the Saskatchewan Health Authority. The Critical Care Triage Stage will be determined based on information provided by the System Flow Coordination Centre and extensive consultation with healthcare system administrators and public health experts. The resource allocation criteria in each Critical Care Triage Stage will be applied uniformly across the province. **For pediatric patients, the triage team is accessed through System Flow Coordination Center (SFCC). The Pediatric protocol should be activated by the Chief Medical Officer and when 100% (Stage 2) of PICU baseline capacity occupied.**

## **H. Oversight**

### **Documentation**

Each referral to the Triage Team will be documented in the attached Triage Documentation Record by the Ethics team member (Appendix 2).

### **Critical Care Triage Oversight Committee.**

Oversight of the Triage Plan will be the responsibility of the Critical Care Triage Oversight Committee. This committee will be chaired by the ED, Academics and Learning of the Saskatchewan Health Authority. The Chair is responsible for inviting members to join the Critical Care Triage Oversight Committee.

The Critical Care Triage Oversight Committee should be formed, and Terms of Reference defined by its Chair, prior to the implementation of this Triage Plan. The Critical Care Triage Oversight Committee will have the following major functions:

- Update the Triage Plan and Triage Protocol
  - This will be necessary in the case of:
    - New clinical data that can inform prognostic models (informed by COVID-19 Evidence Review Team)
    - Rapid escalation in ICU capacity utilization, which may necessitate an expansion of exclusion criteria.
    - Extreme scarcity, which may necessitate an expansion of criteria for palliation.
    - Feedback from frontline clinicians that indicates the Triage Plan is ineffective (not meeting stated goals of saving the most lives and life-years) or has unintended consequences.
- Review triage decisions for fidelity to triage policy.
- Mediate disagreements that arise within the Triage Team(s)
- Make recommendations for termination of the Triage Plan when appropriate (see 6. Termination, below)
- Perform a retrospective quality improvement analysis.

The Committee will consist of a minimum of:

At least two (2) physicians:

- one (1) tertiary critical care physician; and
- one (1) tertiary acute care physician.

At least two (2) acute care nurses:

- one (1) from a tertiary center; and
- one (1) from a rural centre.

One (1) physician with expertise in transplant allocation decisions and one (1) pediatrician;

One (1) legal advisor;

One (1) patient-family advisor registered with the SHA;

One (1) representative of First Nations and Metis Health registered with the SHA;

One (1) rural acute care physician; and

Ethics Director of the SHA.

Any meeting of the Critical Care Triage Oversight Committee must achieve a quorum of  $\geq 70\%$  (7/10 members). Decisions are made by majority, with the Chair generally abstaining to vote, unless needed to break a tie.

## **I. Reviews**

### **Immediate Reviews**

Reviews should be processed in an efficient manner. Given the nature of mass critical care incidents, only fact-based reviews from 1) the Most Responsible Physicians or 2) any Triage Team member will be accepted. These reviews could be on the basis of an initial evaluation that is incorrect, a change (improvement or deterioration) in clinical state, new clinical information, or evidence of deviation from the approved triage process.

Reviews from the patient's MRP are accessed through SFCC. The MRP should ask to be directed to the Triage Team for a review of a prior decision. The review should be conducted by a different Triage Team than the one that made the first triage decision. If the second Triage Team decision is thought to be incorrect for the reasons outlined above, the MRP may ask for a review by the Critical Care Oversight Committee. In contrast, requests for a review from any member of the Triage Team must be directed to the Critical Care Triage Oversight Committee directly.

### **Retrospective Reviews**

The Critical Care Triage Oversight Committee will conduct a retrospective quality improvement review. This will identify areas of process improvement, inform future triage protocols, and contribute to the literature on performance of triage protocols.

Following the pandemic, families may request for further information regarding Triage Team decisions through the Client Concerns Coordinators, or through the usual complaints process in their local centre. These requests for further information will be reviewed by the Critical Care Triage Oversight Committee. Open and honest communication regarding the reasons for the Triage Team decision and Triage Team process should be provided to families.

## J. Triage Team

### Roles

The Triage Team will receive referrals for patients who could potentially benefit from ICU care, review the cases, and determine which patients will be provided with ICU care. The Most Responsible Physician (MRP) is responsible for consulting ICU when needed, advocating for the patient, and continuity of care.

### Structure & Composition

At a minimum, the Triage Team should consist of at least two peer physicians that are not directly involved in the patient's care, to minimize conflicts of interest.<sup>11</sup> Alternative triage team members should be pediatric intensivists and pediatricians. Additionally, a representative from Ethics should be included as a system of checks and balances.

### Referral Process

Please refer to Figure 1 below for a flow chart of the referral process. The patient's MRP should consult at the Jim Pattison Children's Hospital (through hospital switchboard if ICU services are available on-site, or through SFCC for patients who need to be transferred to another center for critical care. The Pediatric TP will see the patient in consultation or gather information verbally in the case of a remote consultation. Once information has been gathered, the Pediatric TP will ask for the Triage Team to be accessed through SFCC. **Triage for pediatric patients should begin at Pediatric Critical Care Stage 2 and PICU capacity is at 100 to 120%.**

The Pediatric TP will be connected with another pediatric intensivist or acute care physician, ideally at a different site, and an Ethics team member to review the triage protocol and determine whether the patient is a candidate for ICU care. These three consultants will form an *ad hoc* Triage Team. At least one of the pediatric intensivist must represent a tertiary site. The goal is to have a decision in approximately 10 minutes from the time of Triage Team activation.

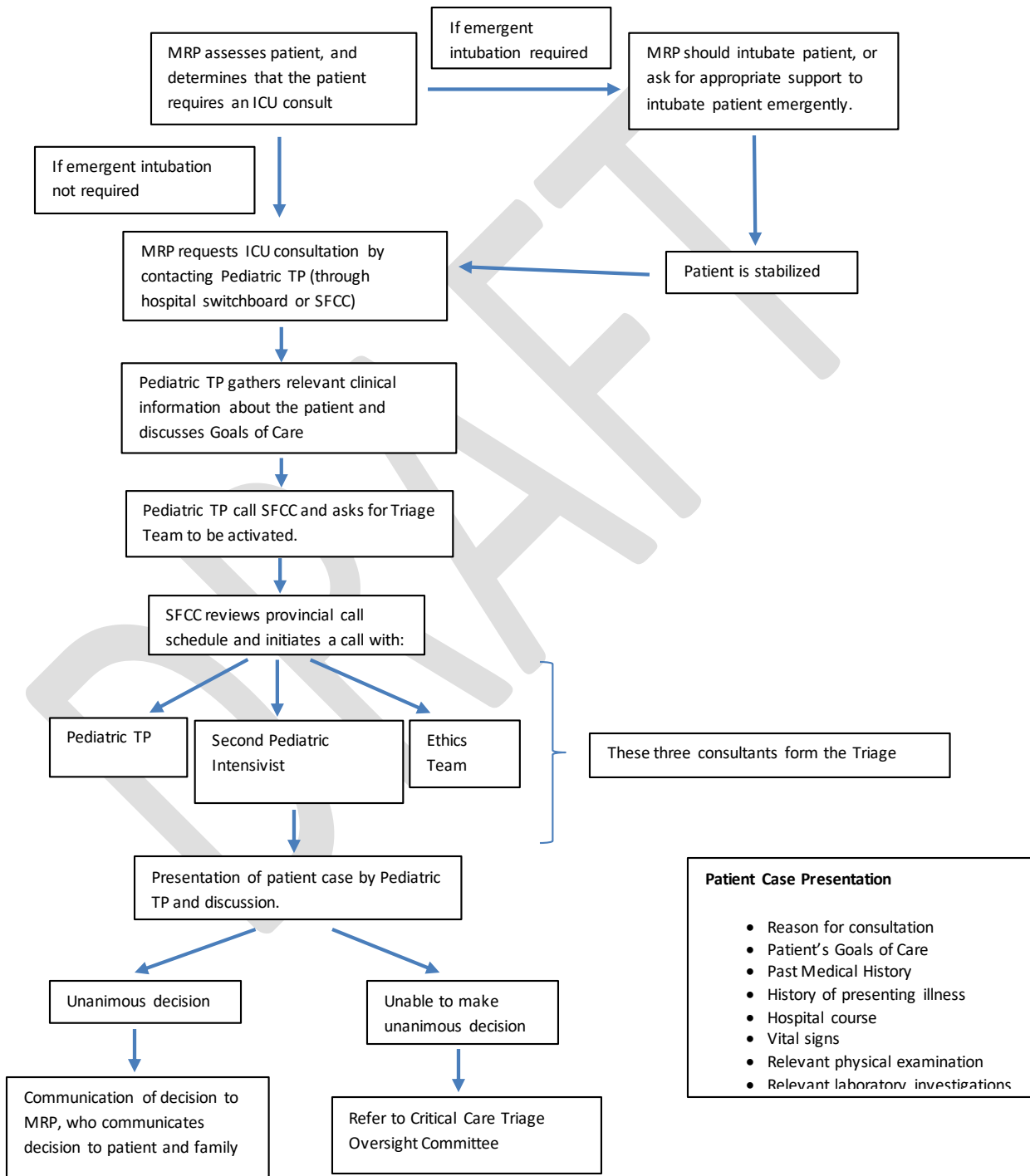
**If the patient is deemed to be an ICU candidate**, the Pediatric TP will arrange for the patient to be admitted to the ICU by the appropriate local process. The SFCC should aid in directing patients to the center in which their care needs will be met, if transfer is required.

**If the patient is not deemed to be an ICU candidate**, the Pediatric TP will communicate this decision to the MRP, who communicates this decision to the patient and their family. Palliative care must then be provided by the MRP or a consultant palliative care physician. **Note that if a patient improves clinically after being offered palliative care only, the MRP may request another triage assessment to determine if the patient has become a candidate for ICU care.**

In the event that the patient is found to be *in extremis* and requires intubation before an ICU consultation and Triage Team discussion can take place, the patient should be intubated and bagged. This respects the Rule of

Rescue, which places a duty on clinicians to save an endangered life when possible. However, following intubation, the above outlined process should be followed to determine whether the patient is an ICU candidate. If the patient is not an ICU candidate, the endotracheal tube should be withdrawn and the patient should be provided with appropriate palliative care.

**Figure 1. Critical Care Triage Team Referral Process**



## **K. Termination**

The Pediatric Triage Protocol will be terminated by the CMO upon the recommendation of the Critical Care Triage Oversight Committee. The termination of this framework should be recommended based on consultation with public health experts and hospital administrators. Triggers that should alert the Oversight Committee to the potential need for termination of the Triage plan include 1) return to a pre-defined level of capacity utilization and/or 2) a sustained reduction in the incidence of COVID-19 cases.

## **L. Psychological Support**

The decisions and actions that the Triage Team, Critical Care Triage Oversight Committee, patient family advisors and frontline healthcare workers must undertake in the face of the COVID-19 pandemic are, and will continue to be, a significant source of moral and psychological distress. Saskatchewan Health Authority will provide access to psychological support for all healthcare workers and volunteer members of the Oversight Committee involved in this process.

## **M. Ethics support**

The COVID-19 pandemic will require the Saskatchewan health system to tackle difficult ethical issues. Resource allocation decisions will be challenging and force the public and health sector to consider a number of possibilities. By anticipating these issues now, and clearly identifying how decisions will be made, the SHA is in a much stronger position to make and accept difficult decisions.

For support with pandemic planning or clinical decision-making, contact Ethics at:

[ethics@saskhealthauthority.ca](mailto:ethics@saskhealthauthority.ca)

Saskatoon & area: Dr. Melody Isinger, Director, Ethics (306-321-6176)

Northern Networks: Clinical Ethicist (306-941-7794)

Outside Saskatoon: Call 811 (to be redirected to your [Local Ethics Committee Chair](#))

Emmanuel Health facilities: Clinical Ethicist (306-655-5517)

**Table I - Pediatric Logistic Organ Dysfunction Score - (PELOD-2)<sup>6</sup>**

Organ dysfunctions and variables	Points by severity level						
	0	1	2	3	4	5	6
<b>Neurologic</b>							
• Glasgow coma score	≥11	5-10			3-4		
• Pupillary reaction	Both reactive					Both fixed	
<b>Cardiovascular</b>							
• Lactatemia (mmol/L)	<5.0	5.0-10.9			≥11.0		
• Mean arterial pressure (mmHg)							
(months)							
0-<1	≥ 46		31-45	17-30			≤ 16
1-11	≥ 55		39-54	25-28			≤ 24
12-23	≥ 60		44-59	31-43			≤ 30
24-59	≥ 62		46-61	32-44			≤ 31
60-143	≥ 65		49-64	36-48			≤ 35
≥144	≥ 67		52-66	38-51			≤ 37
<b>Renal</b>							
• Creatinine (µmol/L)							
(months)							
0-<1	≥ 69		≥ 70				
1-11	≥ 22		≥ 23				
12-23	≥ 34		≥ 35				
24-59	≥ 50		≥ 51				
60-143	≥ 58		≥ 59				
≥144	≥ 92		≥ 93				
<b>Respiratory</b>							
• PaO <sub>2</sub> (mmHg)/FiO <sub>2</sub>	≥ 61		≤ 60				
• PacO <sub>2</sub> (mmHg)	≥ 58	59-94		≥ 95			
• Invasive ventilation	No			Yes			
<b>Hematologic</b>							
• WBC Count (x10 <sup>9</sup> /L)	≥2		≤ 2				
• Platelet (x10 <sup>9</sup> /L)	≥142	77-141	≤ 76				

**Relationship between number of organ dysfunctions, PELOD-2 score, and mortality rate**

Number of organ dysfunctions	PELOD-2 Score Mean (SD)	Mortality rate (%)
0	0 (0.0)	0.4
1	2.3 (0.8)	0.3
2	4.9 (1.3)	1.2
3	7.5 (2.0)	7.1
4	11.5 (4.4)	30.5
5	16.8 (5.2)	59.0

SD = Standard deviation

**Table 2 – PedCTAS**

Level 1 Resuscitation	<ul style="list-style-type: none"> <li>• Seizure (actively seizing)</li> <li>• Unconscious</li> <li>• Major Trauma</li> <li>• Severe Respiratory Distress</li> </ul>
Level 2 Emergent	<ul style="list-style-type: none"> <li>• Severe dehydration</li> <li>• Shortness of breath (moderate respiratory distress) O2 Sat &lt;92</li> <li>• Sore throat with unusual drooling</li> <li>• Permanent tooth dental Avulsion</li> </ul>
Level 3 Urgent	<ul style="list-style-type: none"> <li>• Seizure prior to ED, now alert</li> <li>• Foreign body aspiration, no respiratory distress</li> <li>• Puncture wound of soft palate</li> <li>• Moderate asthma, O2 Sat = 92-94</li> <li>• Head injury, loss of consciousness but now alert (GCS 14 – 15)</li> </ul>
Level 4 Less Urgent	<ul style="list-style-type: none"> <li>• Mild asthma, O2 Sat&gt;94</li> <li>• Lacerations, require sutures</li> <li>• Minor head injury, no loss of consciousness</li> <li>• Fever, unspecified (looks well) [brought from school]</li> </ul>
Level 5 Non-Urgent	<ul style="list-style-type: none"> <li>• Dressing change</li> <li>• Prescription renewal</li> <li>• Bites, minor</li> <li>• Minor laceration not requiring stitches</li> </ul>

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**Table 3: Funded ICU Beds in Saskatchewan**

Site	Beds
Battlefords Union Hospital (North Battleford)	3
Victoria Hospital (Prince Albert)	8
Royal University Hospital (Saskatoon)	15
St. Paul's Hospital (Saskatoon)	12
Regina General Hospital Surgical ICU (Regina)	10
Regina General Hospital Medical ICU (Regina)	10
Pasqua Hospital (Regina)	7
Cypress Regional Hospital (Swift Current)	4
Five Hills Health Region (Moose Jaw)	4
Yorkton Regional Health Centre (Yorkton)	6
Total	79

**Appendix 1: Detailed Exclusion Criteria for Critical Care Triage Stages 1-4**



	Critical Care Triage Stage 1	Critical Triage Stage 2	Critical Care Triage Stage 3 & 4
<u>Parent, Patient* Preference</u>	As documented by Goals of Care and Advance Care Planning discussions	As documented by Goals of Care and Advance Care Planning discussions.	As documented by Goals of Care and Advance Care Planning discussions.
<u>Past Medical History</u>	Clinician judgement. Must be mutually agreed upon by parent or patient and clinician.	Clinician judgement. Must be mutually agreed upon by parent or patient and clinician.	<ul style="list-style-type: none"> <li>• Known DNR (Do Not Resuscitate) order</li> <li>• Known incurable malignant disease</li> <li>• Irreversible end stage organ failure with no options of treatment</li> <li>• Severe and irreversible neurologic event or conditions with ongoing coma or Glasgow Coma Scale &lt;5</li> <li>• Cardiac arrest not responsive to full Pediatric Advanced Life Support (PALS) or Basic Life Support (BLS) efforts</li> <li>• Lethal chromosomal/genetic disorders</li> </ul>
<u>Severity of Presenting Illness</u>	Clinician judgement. Must be mutually agreed upon by parent or patient and clinician.	Pediatric PELOD-2 score 12-13 RCPCH Scores Urgency - Moderate – 30-70% of dying or of suffering serious harm if patient does not receive treatment in the near future. Survival – Moderate - 30-70% of survival if provided with treatment. Benefit – Moderate 30-70% of requiring only short duration support if provided with treatment	<ul style="list-style-type: none"> <li>• Severe complex trauma</li> <li>• Severe &amp; irreversible neurological impairment</li> <li>• Severe immunocompromised</li> <li>• Severe burn with &gt; 30% total body surface area third degree level</li> <li>• Complex multi-system disorders with extremely high medical needs</li> <li>• Chronic conditions with known or predicted severe mortality</li> <li>• PED-CATS Level 3 or higher</li> <li>• PELOD-2 score of 5</li> <li>• RCPCH Scores               <ul style="list-style-type: none"> <li>• Urgency - Low</li> <li>• Survival - Low</li> <li>• Benefit - Low</li> <li>• Palliative</li> </ul> </li> </ul>

\* If patient is a mature minor.

## Appendix 2: Pediatric Assessment Record

PHN	DOB	LOCATION	PELOD-2 Score	PED-CTAS Level	Urgency Level	Survival Level	Benefit Level

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**Appendix 3: Multi-principle Strategy for Determining Triage Priority Score<sup>12</sup>**

	0 POINTS	1 POINT	2 POINTS	3 POINTS	4 POINTS
SOFA score (Table 1-A) Or PELOD-2 score		ADULT SOFA SCORE (<6) OR PEDIATRIC PELOD-2 SCORE <12	ADULT SOFA SCORE (6-8)  OR PEDIATRIC PELOD-2 SCORE 12- 13	ADULT SOFA SCORE (9-11) OR PEDIATRIC PELOD-2 SCORE 14-16	ADULT SOFA SCORE (≥12) OR PEDIATRIC PELOD-2 SCORE ≥ 17

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**Appendix 4: Triage Tracking Log**

Tracking Number	PHN	DOB	Location	Time of Call to Triage Team	Triage Decision	RA Time*	RA Decision*	Appeal Date	Appeal Decision
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Triage Decision = Not meeting inclusion criteria, meets exclusion criteria

RA Time\* = Reassessment Time, if applicable

RA Decision\* = Reassessment Decision, if applicable

**Appendix 5: Family Communication**

Note that all of the situations below assume that Critical Care Triage Stage 2, 3 or 4 have been met. The phone call should be performed by the Most Responsible Physician (MRP) and documented in the Interdisciplinary Progress Notes. The MRP should speak with the patient if a mature minor, or if the patient is not a mature minor or lacks capacity, the MRO should ensure that s(he) is speaking with the patient's appropriate substitute decision maker. Pediatric patients who are mature minors should be encouraged to include their parents or legal guardians in the discussion. The MRP should ensure that s(he) is speaking with the patient's appropriate substitute decision maker.

Situation	Script
Patient is admitted to the ICU	<p>Hello, my name is _____. I am the doctor looking after [Patient's name]. Unfortunately, [Patient's name]'s condition has gotten worse, and we have to take <u>him/her</u> to the ICU. In the ICU, [Patient's name] will be placed on a breathing machine or ventilator and will be given medications to increase <u>his/her</u> blood pressure if needed. In other words, <u>he/she</u> is needing life support right now. That is a lot of information for me to have given you. Do you have any questions? <u>[Answer questions with as much information as is known]</u>.</p> <p>[Only read the following paragraph if the patient is COVID-19 positive. If the patient has other reasons for requiring critical care, provide a focused discussion of prognosis here]. The other important thing for you to know is, that with the COVID-19 virus, people who need life support are very, very sick. This is especially true if they have underlying medical conditions, like <u>[insert medical conditions that patient has, if any]</u>. It may be possible that we will not be able to keep [Patient's name] alive, and I am worried that he may die in the ICU. I wanted you to know that we are going to do everything that we can in the next 72 hours to try to get [Patient's name] stabilized. If we see that <u>he/she</u> is clearly getting worse earlier than that, and that <u>he/she</u> will not survive, we will be completely honest and tell you this. If [Patient's name] gets worse suddenly, we will not be able to provide CPR to <u>him/her</u> to try to restart his/her heart. I'm sorry to have to tell you all of this information all together, but I want you to know how serious the situation is. Do you have any other questions for me? <u>[Answer questions with as much information as is known]</u>.</p> <p>In 72 hours, our Triage Team will re-evaluate how [Patient's name] is doing. If <u>he/she</u> is getting worse, we may be in a situation where we would be directed by the Triage Team provide comfort treatment only to [Patient's name]. This decision will be based on very specific criteria developed by the Health Authority. Again, this is a really hard conversation for us to have over the phone, but do you have any questions for me? <u>[Answer questions with as much information as is known]</u>.</p>
Patient is refused admission by the Triage Team and is at the end-of-life	<p>Hello, my name is _____. I am the doctor looking after [Patient's name]. Unfortunately, [Patient's name]'s condition has gotten worse. Right now, <u>he/she</u> <u>[insert description of clinical status here, i.e. his/her lungs are so sick that, despite providing maximum oxygen, we can't keep his/her oxygen levels in the normal range]</u>. I have discussed the situation with our Triage Team about whether we should take (Patient's name) to the ICU. Unfortunately, we are not in a normal situation in Saskatchewan. Because of the COVID-19 crisis, we don't have enough breathing machines or ICU beds. Therefore, the Health Authority has stated that we must provide our resources to patients who meet very specific criteria developed by the Health Authority.</p>

	<p>When we look at [Patient's name]'s case, because of [insert exclusion criteria here], we know that even if we were to put him/her on life support, he/she would still have an extremely poor chance of making it out of the ICU alive. I have advocated for [Patient's name] to be taken to the ICU, but our Triage Team has made a decision that we cannot provide a <u>breathing machine/ICU bed</u> for him/her based on their very specific criteria <u>[give details]</u>.</p> <p>Even though we cannot provide a <u>breathing machine/ICU bed</u> for [Patient's name], we are going to do everything that we can to make sure that <u>he/she</u> is comfortable during the final stage of his illness in the hospital. We will provide medications for pain and breathing problems, and make sure that <u>he/she</u> is attended to by our nurses and doctors. I am so sorry to have to tell you this.</p> <p><u>[Make arrangements for the family to "be" with the patient as much as possible. If visitor restrictions do not allow family to be at the bedside of the dying patient, then provide the opportunity for a video conference, or offer to tell the patient a message from the family.]</u></p> <p>Do you have any other questions for me? Is there anything else I can do for you?</p> <p><u>[Arrange for Social Work Follow-up]</u></p>
<p>A decision is made to re-allocate ventilator (i.e. at 72 hour or later reassessment).</p>	<p>Hello, my name is _____. I am the doctor looking after [Patient's name]. We have been taking care of [Patient's name] for [72hours/120 hours] in the ICU, and watching [his/her] progress. We have seen him/her <u>[not get better/get slowly worse]</u>. At this point we are supporting <u>his/her</u> <u>[provide clinical information here i.e. lungs, heart, kidneys etc]</u>.</p> <p>As you know, we are in a situation in Saskatchewan that, because of the COVID-19 crisis, we don't have enough breathing machines or ICU beds. Therefore, the Health Authority has stated that we must provide our resources to patients who continue to meet very specific criteria. At this time, our Triage Team has looked at [Patient's name]'s situation, and because he is <u>[not getting better/getting worse]</u> we cannot provide the <u>breathing machine/ICU bed</u> to <u>him/her</u> anymore. This was not a decision that was taken lightly, and it was based on very specific criteria developed by the Health Authority.</p> <p>Even though we cannot provide a <u>breathing machine/ICU bed</u> for [Patient's name], we are going to do everything that we can to make sure that <u>he/she</u> is comfortable during the final stage of his illness in the hospital. We will provide medications for pain and breathing problems, and make sure that <u>he/she</u> is attended to by our nurses and doctors. I am so sorry to have to tell you this.</p> <p><u>[Make arrangements for the family to "be" with the patient as much as possible. If visitor restrictions do not allow family to be at the bedside of the dying patient, then provide the opportunity for a video conference, or offer to tell the patient a message from the family.]</u></p> <p>Do you have any other questions for me? Is there anything else I can do for you?</p>

	[Arrange for Social Work Follow-up]
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