Canadian Society of Transplantation
Société canadienne de transplantation
Paediatric Group

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LEADERSHIP IN CANADIAN TRANSPLANTATION | LEADERSHIP EN TRANSPLANTATION AU CANADA

Management of Paediatric Kidney Transplant Patients during the COVID-19 Pandemic: Guidance from the Canadian Society of Transplantation Paediatric Group

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on behalf of the CST Paediatric Group

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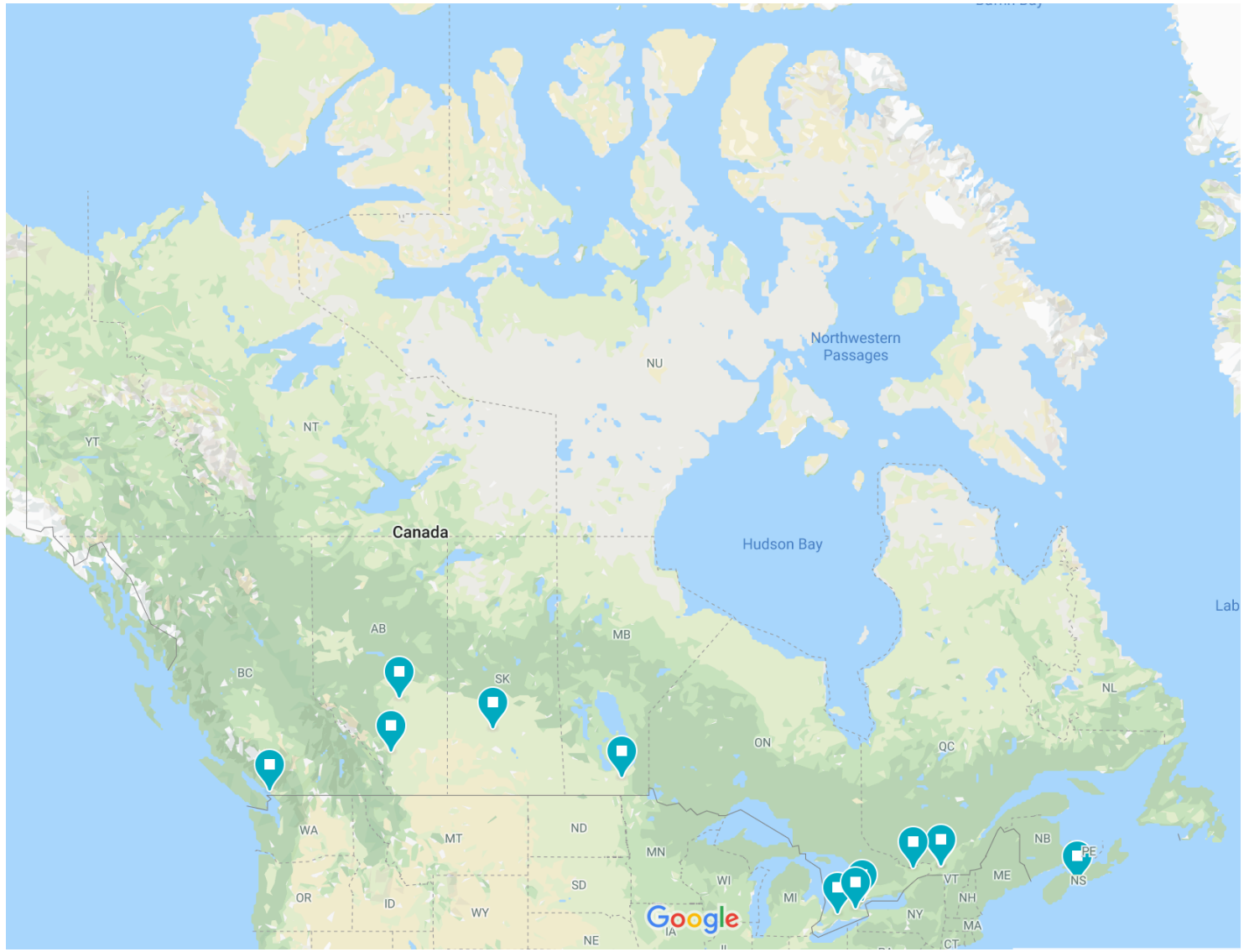
Special thanks to:

Canadian Society of Nephrology/
Société canadienne de néphrologie
CSN/SCN

CAPN Association des Néphrologues Pédiatriques du Canada
Canadian Association of Paediatric Nephrologists ANPC



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Aims

- To provide guidance on the management of paediatric kidney transplant patients during the COVID-19 pandemic
- To aid paediatric kidney transplant directors, clinicians and administrators to provide best patient care in context of limited resources while protecting patients & healthcare providers wherever possible by limiting exposure to COVID-19

Scope

- Pertain to care of paediatric patients with kidney transplants who would typically receive multidisciplinary care
- Limited to the unique aspects of paediatric kidney transplant care. Other general care practices should follow the most current national/provincial public health policies

Based on information available at time of writing: July 1, 2020

Sources of information

- Published academic literature
- Unpublished/pre-print academic literature
- Documents from international, national and provincial kidney transplant societies/agencies and organ procurement agencies
- International/national webinars on COVID-19
- Program-specific documents
- Survey of 9 paediatric kidney transplant programs across 7 provinces in Canada
- Expert opinion

Methods

Led and coordinated by the CST Paediatric Group

- Formed a workgroup of paediatric kidney transplant nephrologists – one of whom is an ethicist
- Document drafted, reviewed and discussed by members of working group via email and virtual meetings
- Disagreements resolved by consensus
- Document reviewed by CST Kidney Transplant Working group, CSN COVID-19 Rapid Response Team and a paediatric transplant infectious disease expert

Principles that guided this work

Principles	Description
Uncertainty	Acknowledge that clinicians/administrators are now working in a swiftly evolving environment which will require decision making with limited resources and greater uncertainty
Macro-allocation	Acknowledge that the local context/government priorities will shape decision making and that previous standards may need to be temporarily adjusted in order to maximize health outcomes for the greatest number of patients
Minimize net harm	Includes limiting the spread of disease and disruption to the health care system
Reciprocity	Protect our healthcare workforce from COVID-19 so staffing levels are maintained in order to deliver care to patients who often require physical interventions

Principles that guided this work

Principles	Description
Fairness	Ensure that patients with kidney disease continue to receive appropriate treatments regardless of their COVID-19 status and avoid outcomes that disproportionately impact those who are most vulnerable (e.g. lower socioeconomic status)
Proportionality	Keep restrictions on staff and patients commensurate with the level of risk to public health
Respect for autonomy	Continue to reflect patient values and beliefs as much as possible, granting that choices may be limited in a pandemic
Fidelity	Maintain commitment to patients to provide necessary care in challenging times and when there is a degree of risk to providers

Survey of paediatric kidney transplant across Canada

- April 2020 - 9 paediatric kidney transplant programs (7 provinces)
- Key findings:

Topic	Status
Transplant activity	• Suspended living donor kidney transplant • Limited deceased donor kidney transplant (medically urgent, highly sensitized) • Developing provincial guidance on a phased activity restart based on very similar guiding principles nationally • No programs accepting donors/recipients who are confirmed or highly suspected to be COVID-19 positive

Survey of paediatric kidney transplant across Canada

Topic	Status
Outpatient activity	• Continued with scheduled transplant clinic visits • Many programs extended routine follow-up for stable patients • Virtual visits were performed unless urgent indications that necessitation in-person visits (telephone, video) • All in-person visits followed local IPAC guidelines
Bloodwork monitoring	• All programs continuing bloodwork monitoring but reduced frequency for some stable patients • Performed in community and hospital labs • All hospitals enacted precautionary measures to reduce risk of transmission of SARS-CoV-2 • Some provinces have designated community labs for immunocompromised patients

Survey of paediatric kidney transplant across Canada

Topic	Status
MDT care	• All programs continue to provide MDT care - virtually
Kidney biopsies	• Urgent indication allograft biopsies continue to be performed • Elective/surveillance biopsies have generally been deferred • Patients are screened/tested for COVID-19 prior to all procedures
Challenges identified	• Potential supply chain disruptions ie medications, antibodies for IF • Virtual visits: lack of technological infrastructure, additional time needed, inability to perform physical exam, limited remuneration • Need for rapid reorganization of clinic infrastructure/resources • Patient/family anxiety related to COVID-19 impacting on care • Lack of established knowledge to make informed decisions on IS • Lack of knowledge of risks related to COVID-19 in paediatric kidney transplant recipients • Lack of capacity to communicate en-masse as recommendations change

Survey of paediatric kidney transplant across Canada

Topic	Status
Successes identified	• Able to continue delivering patient care in rapidly evolving environment • Able to provide timely communication with patients/families • No paediatric kidney transplant patients diagnosed with COVID-19 – few reports internationally of significant complications • Able to quickly form a cohesive, working group of paediatric kidney transplant professionals from across the country to share evolving experience/knowledge and develop consensus guidance document with rapidly evolving evidence base • Able to partner with other organ groups, adult care colleagues and international colleagues to gather and respond to best available evidence

Key issues & suggestions

1. Transplant activity
2. Outpatient clinic activity
3. Monitoring
4. Multidisciplinary care
5. Medications
6. Patient/Family education/support
7. School, daycare, summer camp and employment
8. Management of paediatric kidney transplant patients who are COVID-19 positive

Key issues & suggestions

1. Transplant Activity

1.1. All paediatric kidney transplantation should be considered an ***urgent life-saving*** procedure and be given ***priority*** for booking when hospitals plan gradual restarting of activity

1.2. We suggest ongoing national collaboration to develop a unified approach to suspension/resumption of kidney transplant activity based on careful consideration of risks vs benefits of transplantation based on these considerations:

1.2.1. In general, the ***benefits of kidney transplant outweigh the risks***, and both life expectancy and QoL are improved when compared with staying/starting dialysis

1.2.2. The degree of community spread and active cases of COVID-19 locally may contribute to risks and benefits at that particular site, so it may be reasonable for different sites to re-open at different rates and different times

1.2.3. Availability of ***rapid and accurate COVID-19 testing on donors/recipients*** is essential to ensure timely identification of infected individuals to mitigate the risks of acquisition and transmission

Key issues & suggestions

1. Transplant Activity

1.2.4. ***Clear guidance/criteria*** for ***donor and recipient COVID-19 screening and testing*** should be provided by transplant centres in collaboration with their university, hospital leadership, organ procurement agency, and public health

1.2.5. Availability of hospital and ***healthcare system capacity*** for in-patient beds, intensive care beds, ventilators, diagnostic testing, staffing and adequate ***personal protective equipment*** both in the pediatric centre and the adult centre (in the case of a living donor)

1.2.6. Iatrogenic risk for SARS-CoV-2 acquisition and transmission should be minimized, with provision of ***clear COVID-19 free pathway*** for hospital in-patient and out-patient care

1.2.7. ***Risks to living donors*** should be considered in any decisions regarding re-opening of living donor programs

1.2.8. Programs should strive for ***clear guidance/criteria*** for ***transplant activity suspension/modification*** taking the above considerations into account, and be ***prepared to review/change*** recommendations as new evidence emerges

Key issues & suggestions

1. Transplant Activity

1.3. We recommend that only ***COVID-19 negative donor and recipient*** pairs proceed to transplantation

1.4. During the pandemic, we recommend that all potential recipients be informed at the time of organ offer, of the potential risk of contracting COVID-19 and associated risks of developing severe complications during the hospital stay and after discharge home. This ***informed consent*** should be clearly documented in the medical records (documentation of verbal consent as per exceptional distribution consent), acknowledging the paucity of clear evidence on transmission at this time

1.5. We suggest that each jurisdiction and centre develop a ***communication*** strategy to keep patients/families of those who are eligible and/or on the transplant wait-list informed

Key issues & suggestions

1. Transplant Activity

1.6. We recommend that all healthcare professionals involved in organ donation and transplantation use appropriate ***personal protective equipment (PPE)*** and that health authorities ensure that sufficient PPE is available to these providers

1.6.1. We suggest that all healthcare professionals practice enhanced protection precautions while caring for donors and transplant recipients

1.6.2. We recommend that all healthcare professionals involved in organ donation and transplantation be provided with appropriate PPE and training on how to use these equipment

Key issues & suggestions

2. Outpatient Clinic Activity

2.1. We suggest ***adhering to clinic visit schedules*** where resources permit

2.1.1. We suggest adhering to ***in-person visits*** when necessary for ***urgent issues***, and for routine follow-up visits when ***vital signs measurement, growth parameters, relevant investigations and for physical examination*** are required.

2.1.1.1. We suggest appropriate ***COVID-19 screening*** using local IPAC guidelines

2.1.1.2. We suggest patients who screen positive be directed to the most appropriate facility as per local IPAC guidelines

2.1.2. Where appropriate and when resources permit, we suggest patients are assessed via ***telemedicine or virtual visits*** to reduce the need for travel to/from clinic

Key issues & suggestions

2. Outpatient Clinic Activity

2.1.2. Where appropriate and when resources permit, we suggest patients are assessed via telemedicine or virtual visits to reduce the need for travel to/from clinic

2.1.2.1. Patients should be provided with ***clear instructions*** regarding blood work, performing blood pressure and/or weight measurements and preparation of a current medication list in advance of their telehealth visit

2.1.3. We suggest that ***a minimum of one parent or caregiver*** be allowed to accompany paediatric patients to their visits whenever possible

2.2. We suggest an individualized approach regarding clinic visits based on clinical need/urgency and/or need for investigations

2.3. We suggest centres consider increasing intervals between subsequent routine follow-up outpatient visits based on individual patients' clinical status

2.4. We suggest clear communication to all patients about the centre's plan for ongoing kidney transplant care

2.5. We suggest providing patients/families with ***information on how to seek medical care*** in case of development of symptoms of COVID-19 – this should include urgent/emergent and routine care plans

Key issues & suggestions

3. Monitoring

3.1. Laboratory testing

3.1.1. We suggest that ***patients continue to have their routine laboratory studies***, viral load testing and therapeutic drug level monitoring (tacrolimus, cyclosporine, mycophenolate) performed as determined by each centre

3.1.2. We recommend establishing a clear ***COVID-19 free pathway*** for in-hospital and community lab testing

3.1.3. We suggest that laboratory studies be performed in testing facilities with established procedures to mitigate risk of infection (in-hospital and/or community laboratories)

3.1.4. We suggest establishing a system for timely follow-up on laboratory test results if a clinic visit is deferred/postponed

3.1.5. In communities/areas with ***active community SARS-CoV-2 transmission***, we suggest considering ***increasing the interval*** between routine monitoring laboratory studies, ***where clinical status permits*** (as determined by each centre)

Key issues & suggestions

3. Monitoring

3.2. ***Home monitoring***

3.2.1. Where resources and patient/family circumstances permit, we suggest that patients monitor their weight, height and blood pressures at home using a calibrated device

3.2.2. Other types of home monitoring should be considered based on each patient's needs or abilities

3.3. Kidney biopsies

3.3.1. We suggest that urgent, ***for-cause kidney allograft biopsies continue*** to be performed as clinically indicated

3.3.2. We suggest ***deferring surveillance/protocol kidney allograft biopsies*** that are ***not time-sensitive*** and where ***clinical status permits*** (as determined by each centre)

3.4. We do not recommend testing of asymptomatic paediatric kidney transplant patients for COVID-19, unless directed by Public health or as required in advance of admissions, procedures etc

Key issues & suggestions

4. Multidisciplinary Care

4.1. We suggest that ***multidisciplinary care continue*** to be provided as resources permit

4.2. When possible, we suggest that care providers perform ***telehealth assessments*** as resources permit

4.3. When ***in-person visits*** are needed, we suggest that care providers practice ***physical distancing*** from patients/families and other providers, and/or use appropriate ***personal protective equipment*** when appropriate

4.4. We suggest that communication between care providers be undertaken via telephone, secure email and/or secure virtual platforms

4.5. We suggest that clinical documentation be continued as per usual standard of care, and information be conveyed to the primary care provider and other relevant healthcare professionals as per usual practice

4.6. ***Mental health*** and ***psychosocial risk factors*** should be ***actively screened*** by the multidisciplinary team

Key issues & suggestions

5. Medications

5.1. Immunosuppression

5.1.1. We recommend that each centre continue to determine the degree of immunosuppression required on a case-by-case consideration, to ***avoid under- or over-immunosuppression***

5.1.2. We suggest ***avoiding*** the use of ***lymphocyte-depleting induction*** agents

5.2. Others

5.2.1. We suggest that ***ACE inhibitors*** and ***ARBs should not be routinely discontinued*** as a result of the COVID-19 pandemic

5.2.2. Initiation or discontinuation of ACE inhibitors and/or ARBs should be performed at the clinical discretion of the individual physician

5.2.3. We suggest that ACE inhibitors and ARBs should be held according to usual sick day guidance

5.3. We recommend that patients ensure that they have ***one month's supply*** of their immunosuppression and other medications available, with adequate prescription refills to allow for timely dispensing of medications

Key issues & suggestions

6. Patient/Family Education/Support

6.1. When possible, we suggest that patient/family education be carried out via telehealth, supported by electronic education material

6.2. We suggest providing patients/families with ***information on how to seek medical care*** in case of development of symptoms of COVID-19 – this should include urgent/emergent and routine care plans

6.3. We suggest that patients continue to receive ***education*** about their diagnosis, ongoing clinical status and treatment plan

6.4. We suggest compilation of ***clinically vetted information***, maintained by professional organizations/societies to be shared with patients where appropriate

Key issues & suggestions

6. Patient/Family Education/Support

6.5. COVID-19 specific educational resources:

- https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html
- https://www.cps.ca/en/tools-outils/covid-19-information-and-resources-for-paediatricians
- https://www.cst-transplant.ca/COVID-19_Information.html
- https://profedu.blood.ca/en/organs-and-tissues/covid-19-update-organ-donation-and-transplantation-services
- https://tts.org/index.php?option=com_content&view=article&id=692&Itemid=115
- https://www.myast.org/covid-19-information
- https://tts.org/ipta-about/ipta-presidents-message/146-uncategorised/ipta/ipta-about/701-ipta-paediatric-information-on-covid-19
- https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- https://www.cdc.gov/coronavirus/2019-ncov/index.html
- https://resources-covid19canada.hub.arcgis.com/
- https://kidney.ca/COVID-19-How-to-Protect-Yourself
- https://publications.msss.gouv.qc.ca/msss/fichiers/2020/20-210-166W.pdf

Key issues & suggestions

7. School, daycare, summer camp & employment

7.1. We advise that children with kidney transplants and their close caregivers/family members take ***extra precautions*** and continue to ***practice enhanced protective precautions*** (ie. frequent hand hygiene, physical distancing) to minimize exposure to SARS-CoV-2

7.2. We strongly advocate for schools, local/provincial school authorities, daycares, summer camps and employment facilities to ***actively take precautionary measures to mitigate risks of SARS-CoV-2 transmission*** in their local environment (ie. masking policy, physical distancing, encouragement of proper hand hygiene practices, policy for staff/participant non-attendance/self-isolation if symptomatic)

7.3. We strongly advocate for schools, local/provincial school authorities, daycares, summer camps and employment facilities to implement ***active screening*** measures to assess risk of SARS-CoV-2 transmission (ie. symptom and/or temperature screening among staff/participants)

Key issues & suggestions

7. School, daycare, summer camp & employment

7.4. We strongly advocate for schools, local/provincial school authorities, daycares, summer camps and employment facilities to maintain active surveillance of their SARS-CoV-2 infection rates among their staff, participants and local community to keep patient/families informed, as well as to facilitate informed decisions about attendance for kidney transplant recipients

7.5. We suggest that the decision to return to school, daycare, summer camp and/or work be considered on a case-by-case basis, with particular consideration of their ***immunosuppressive burden, exposure risk inherent to their school and/or environment and the presence of other comorbid conditions, psychosocial concerns and/or learning needs***

Key issues & suggestions

8. Management of paediatric kidney transplant patients who are COVID-19 positive

8.1. General principles:

8.1.1. We recommend that healthcare professionals managing patients with suspected/confirmed COVID-19 use appropriate ***personal protective equipment (PPE)*** according to local, provincial and national guidelines

8.1.2. We recommend appropriate ***isolation*** of patients with suspected/confirmed COVID-19 in all clinical settings (in-patient, intensive care unit, out-patient, emergency department) (ideally within a specific COVID-19 unit that is separate from other areas with non-COVID-19 patients)

8.1.3. We recommend that patients with symptoms suggestive of COVID-19 be tested according to local guidelines. Healthcare professionals should be aware that children may present with ***atypical symptoms*** (ie. diarrhoea, rash), and thus should have a ***high-level of suspicion***

8.1.4. We recommend that clinical care decisions for patients be assessed on a case-by-case basis with consideration of patient/family resources, local hospital resources and local guidelines

8.1.5. Patients with mild symptoms may not require hospital admission. We suggest ***close monitoring/follow-up*** of patients who are managed as outpatients utilizing telehealth (telephone, video calls) for ***development/worsening of symptoms*** that may warrant hospital admission (tachypnoea, respiratory distress, hypoxia)

8.1.6. We recommend that healthcare professionals managing paediatric kidney transplant recipients maintain a high index of suspicion and be aware of ***atypical presentations of COVID-19 in children*** (gastrointestinal symptoms, multisystem hyperinflammatory syndrome) in order to make timely diagnoses

Key issues & suggestions

8. Management of paediatric kidney transplant patients who are COVID-19 positive

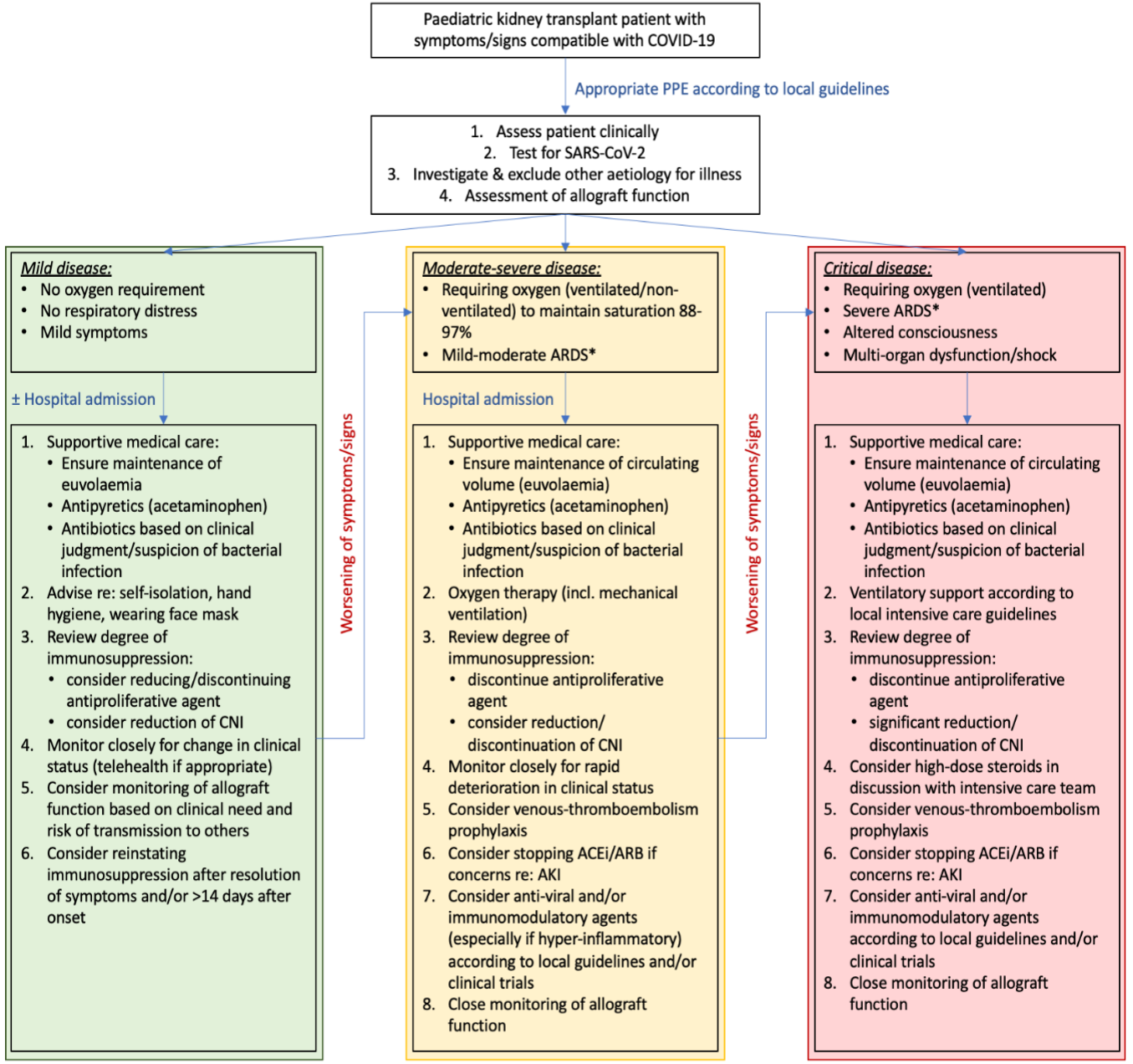
8.2. Immunosuppression management

- 8.2.1. We suggest initial reduction/discontinuation of anti-proliferative agents (Mycophenolate mofetil/Azathioprine)
- 8.2.2. We suggest consideration of reduction/discontinuation of calcineurin inhibitors (Tacrolimus/Cyclosporine) in moderate-severe COVID-19 or if progressive clinical deterioration
- 8.2.3. We suggest consideration of high-dose steroids in consultation with the intensive care team in severe COVID-19, if progressive clinical deterioration or if require ventilatory support

8.3. Considerations for antiviral and/or additional agents

- 8.3.1. At the current moment, there is no definitive evidence to support the efficacy of specific antiviral and/or additional agents for treatment of COVID-19
- 8.3.2. We suggest that the use of these agents be considered in conjunction with local guidelines/practice, emerging evidence or as part of clinical trials
- 8.3.3. If antiviral treatment is used, we suggest close monitoring for potential adverse outcomes and therapeutic drug levels due to possible drug-drug interactions

Suggested algorithm for management of paediatric transplant patients with suspected/confirmed COVID-19



* ARDS definition as per Pediatric Acute Respiratory Distress Syndrome criteria

Limitations

- Full systematic review of available literature was not undertaken for the sake of expediency in development of this guideline
- There is paucity of literature to support evidence-based recommendations at this time – instead, were formulated based on expert opinion based on available knowledge/experience
- Parallel review process may not be as robust as standard arms' length peer-review process
- Subject to biases associated with this level of evidence

Implications

- These recommendations are intended to provide the best care possible during a time of reduced resources
- Due to time/resource constraints affecting individual provincial/local health jurisdictions, we recognize that not all recommendations:
  - may be applicable to all provincial/local health authority practices
  - may be delivered to all patients
- These recommendations may evolve over time as new evidence become available

Questions / Comments / Feedback?
Discussion

Guidance document available until ***July 31, 2020***
for review, comment & feedback
https://csncommunity.ca/event.php?eid=5