Stanford Children's Health | Lucile Packard Children's Hospital Stanford

Stanford Children's Health Hospital Outreach Program (HOP)

Welcome to our new Stanford Children's Health Hospital Outreach Program newsletter

We hope to provide ongoing resources and information to assist you in caring for the children in our community.

Below is a brief introduction to our Hospital Outreach Program (HOP) and a summary of the revised AAP, ACEP, and ENA joint policy statement titled "2018 Guidelines for Care of Children in the Emergency Department," by the American Academy of Pediatrics (AAP), which guides our outreach team's principles and direction. More detailed information is available from the AAP website.

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The majority of ill and injured children are seen at community hospital EDs close to where they live. In the United States, 69% of EDs that are mostly in non–children's hospitals provide care for fewer than 15 children per day. Community hospital EDs need to be prepared to accurately assess, and at a minimum stabilize and safely transfer out, acutely ill and injured children[1].

We are committed through our Hospital Outreach Program (HOP) Steering Committee to assist you in better serving the needs of children presenting to your emergency department through our expert pediatric recommendations, developed partnership, and collective continuity of care. We created a special committee and department within our hospital system to better assist you in recognizing the unique needs of children and their families, to include those with special needs. In addition, we can assist you in developing a plan to evaluate quality of care, safety, and competencies for your hospital's pediatric emergency care. We can also assist in providing feedback on patients transferred to give loop closure to your team.

We at Stanford Children's Health can support you in providing care that is safe and consistent for your patients through our outreach efforts. In addition, Stanford Children's Health stands ready to assist you at times when transfer is necessary for ill or injured children by providing exceptional care that's backed by the research, innovation, and discoveries coming from a leading university and top-ranked academic medical center.

Our new Hospital Outreach Program Steering Committee meets monthly to assess the individual and collective needs of our referring community hospitals. The committee includes members from our Pediatric Emergency Department, PICU, NICU, Acute Care Surgical Subspecialists, Transport Program, Transfer Services, Telemedicine, Marketing, Strategy, Physician Liaison, and REVIVE (Simulation) teams. This committee is led by:

- **Andy Wen, MD**—Clinical Associate Professor of Pediatrics, Director of Regional Critical Care Services, Stanford University School of Medicine
- **Melanie Stroud, RN, MBA**—Director of Hospital Outreach Program and Pediatric Trauma

You can reach us for more information or for patient follow-up questions by emailing **outreach@stanfordchildrens.org**.

"Our new Hospital Outreach Program Steering Committee meets monthly to assess the individual and collective needs of our referring community hospitals."

The AAP Policy Statement makes reference to the resources necessary for community hospitals to take care of children of all ages, and our Hospital Outreach Program stands ready to assist you in the following, based on the AAP recommendations:

- Demonstration and maintenance of pediatric clinical competencies through continuing education—e.g., team training exercises, simulation, participation in conferences and grand rounds.
- Pediatric illness and injuries—assessment and reassessment.
- Assisting with the value of specific structural and process measures on improved patient safety and quality of care—e.g., medication safety, pain assessment / sedation and analgesia, order sets, procedures, equipment safety, evidenced-based clinical pathways.
- Policies, procedures, and protocols.
- Imaging and lab guidelines and recommendations.
- Resuscitation: critical care monitoring, neonatal and pediatric resuscitation.
- Trauma resuscitation and stabilization: traumatic brain injury, fracture management, hemorrhagic control, and recognition of nonaccidental trauma.
- Disaster management, including triage of pediatric victims, tracking and identification, reunification.
- Patient-and-family-centered care: cultural competencies, health literacy, and skills.
- Quality improvement and performance improvement measures, to include the transfer and transport process.
- Social and behavioral health issues, child maltreatment mandated reporting and assessment.
- Death of a child in the ED: emotional assistance for staff and physicians, bereavement counseling.
- Children with special health care needs and developmental disabilities.
- Telehealth and telecommunications.
- Consideration of any other identified needs you may have as our respected partners in the community.

Resources that can be used to assist with the implementation of all aspects of this document can be found at **pediatricreadiness.org**.

1. Remick K, et al. Pediatric Readiness in the Emergency Department. Pediatrics. 2018 Nov;142(5):e20182459. DOI: 10.1542/peds.2018-2459.

Stanford Children's Health Transport Team

The Stanford Children's Health Transport Team is available and ready to help transport sick and injured infants and children throughout the Bay Area. From our bases in Palo Alto and Walnut Creek, a member of our specially trained, nurse-led team is available to be dispatched at a moment's notice to meet the needs of the community. The team is trained in advanced clinical skills such as intubation, central line placement, intraosseous placement, needle decompression, ultrasound-guided PIV placement, and advanced neonatal and pediatric resuscitation.

The newest iteration of our team, the Walnut Creek base, located within John Muir Hospital, began operation in May 2020, despite complications associated with the COVID-19 pandemic. This team is hybrid, neonatal/pediatric, and currently operating 12 hours per day with the hope of expanding to 24-hour coverage in the not-too-distant future. In addition to their transport obligations, they are assisting the Pediatric, NICU, PICU, and Emergency departments with any of their specialty care needs.

The Palo Alto–based teams were also very busy this year. The Neonatal Team continued to lead the way in Neonatal Transport cooling with their participation in the Preemie Cooling Trial. The Pediatric Team successfully transported five patients on ECMO, a record for our team.

This year, all team members participated in a very special COVID-19 simulation to ensure their readiness for this type of transport. Through this simulation, the team was able to optimize how they have been able to transport patients and staff in a safe manner using CDC-recommended PPE, UV decontamination on the ambulance, and other approved strict COVID-19 protocols.

The Pediatric Emergency Department of Stanford Hospital

The Pediatric Emergency Department of Stanford Hospital is committed to research, innovation, and child-centered care. Our pediatric ED is separate from our adult ED, and as a Level I pediatric trauma center, we provide comprehensive 24-hour emergency care that includes direct access to world-ranked pediatric specialists. We have 14 board-certified Pediatric Emergency Medicine physicians staffing the pediatric ED. Ultrasound and MRI are available 24/7 to evaluate patients for possible appendicitis. We also reduce radiation in children by using magnetic resonance imaging (MRI) of the brain to detect intracranial head injury.

We mindfully create an atmosphere of comfort for our most vulnerable population. Our "Ouchless ED" includes innovative treatments such as topical anesthetics and sprays that reduce needle pain, intranasal fentanyl and midazolam, and nitrous oxide.

We serve as the emergency treatment facility for Lucile Packard Children's Hospital (LPCH) and Stanford Hospital. When deemed necessary, we work closely to coordinate a seamless transfer of care to Packard Children's or other appropriate facilities.

During the COVID-19 pandemic, we are providing a high standard of infection control to limit exposure risk, including:

- Designated waiting areas.
- High-efficiency particulate air (HEPA) filters.
- Use of personal protective equipment.
- Social distancing.
- Rigorous cleaning practices approved by Stanford Health Care.

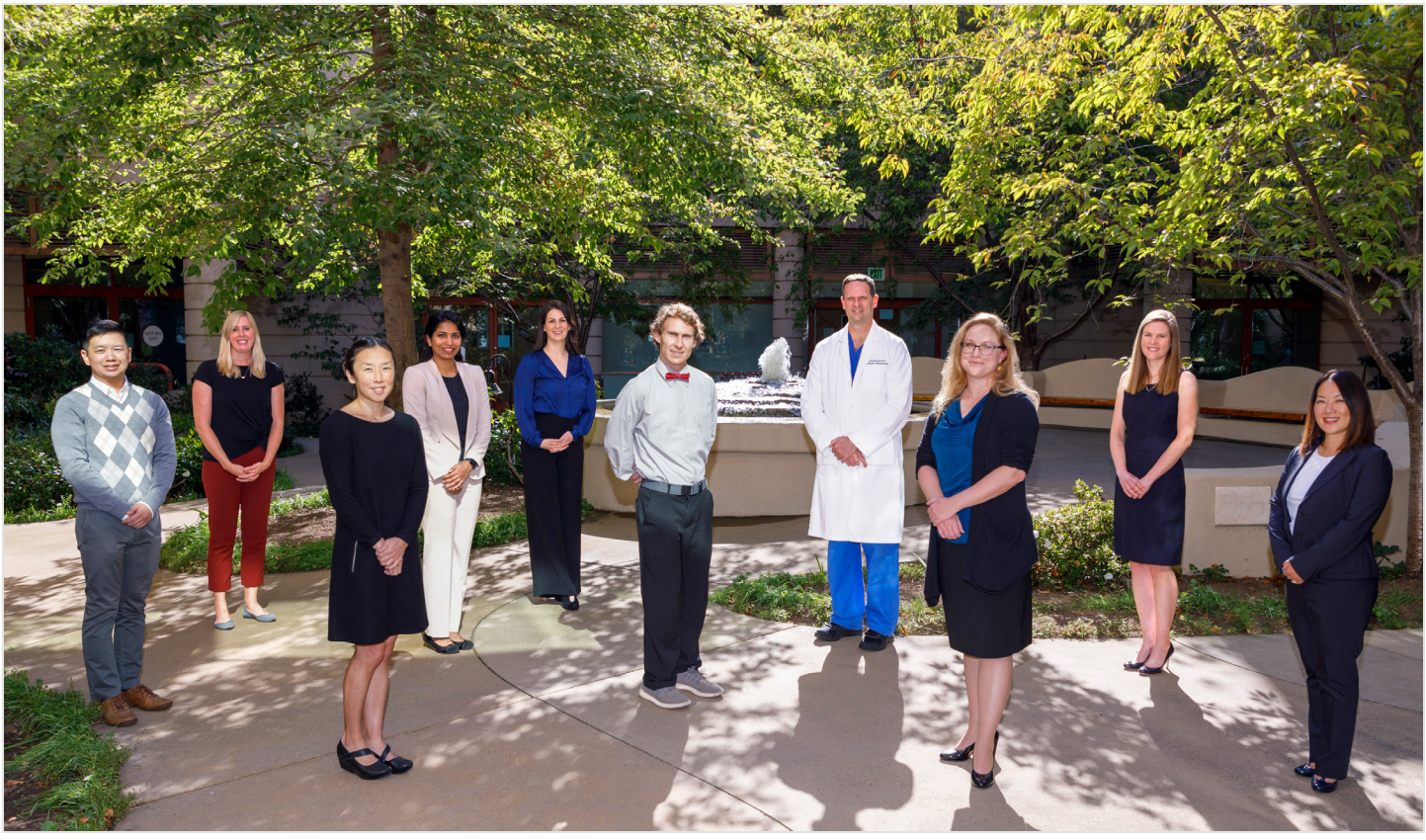
We are excited to announce the construction of a remodeled Pediatric Emergency Department, commenced in October of 2020 and is planned to be completed by early 2022.

Stanford's NeuroPICU 'Provides Comprehensive and Cutting-Edge Pediatric Neurocritical Care'

Building upon collaborations across Neurology, Neurosurgery, and Pediatric Critical Care, Lucile Packard Children's Hospital Stanford launched a dedicated NeuroPICU this summer. This initiative focuses on the care of children with neurological and neurosurgical diseases by specialized nurses with advanced neurocritical care training. We also now perform family-centered bedside rounds daily to provide multidisciplinary care for these children to achieve the best possible outcomes.

The Pediatric Neurocritical Care Team welcomed this year nurse practitioners May Casazza and Nathan Chang; clinical specialist pharmacist Jeff Moss; and a fellowship-trained neurocritical care specialist, Elizabeth Mayne, MD. Our services now include a Pediatric Stroke program with the ability to perform urgent thrombectomy in eligible children; a 24/7 ICU EEG program for monitoring brain function and treating seizures, supported by nine pediatric epilepsy specialists; and state-of-the-art neuromonitoring to care for our neurosurgical postoperative patients.

To contact the Pediatric Neurocritical Care program DL-PNCCProviders@stanfordchildrens.org.



Multisystem Inflammatory Syndrome in Children (MIS-C)

Children infected with SARS-CoV-2 have minimal to no initial respiratory illness, unlike adults. However, a small subset of children develop a constellation of symptoms four to six weeks after exposure to the virus, including high fevers, dysfunction of multiple organs, and significantly elevated inflammatory markers. This disease entity has been labeled Multisystem Inflammatory Syndrome in Children (MIS-C), and both the Centers for Disease Control and Prevention and the World Health Organization have defined criteria for diagnosing MIS-C in pediatric patients. Although the pathogenesis is unclear, data to date suggest a postinfectious autoimmune, inflammatory response, which is different from the cytokine storm that has been reported in adult patients. Given this pathophysiology, patients treated early with steroids, IVIG, and other interleukin antagonists with a tiered approach based on the severity of illness have recovered with a good overall prognosis. MIS-C appears to be a spectrum of disease with children varying in the number of organs involved, the overall severity of illness, and the degree of supportive care they have required.

Lucile Packard Children's Hospital Stanford gathered a multidisciplinary task force to create a MIS-C treatment protocol for our institution. This protocol would assure a standard approach to the care of MIS-C patients and would create a group of ad hoc local experts in the event that we see a large number of cases at our institution. Attached is the MIS-C protocol, which includes the CDC definition, common presenting symptoms, a diagnostic evaluation, disposition of the patients, and a treatment plan from a pharmacological and supportive management standpoint.

For further information, feel free to contact Saraswati Kache, MD, at **skache@stanford.edu**.

"MIS-C appears to be a spectrum of disease with children varying in the number of organs involved, severity of illness, and degree of supportive care required."

Multisystem Inflammatory Syndrome in Children (MIS-C) Pathway

Diagnosis

Inclusion Criteria:

Patients in whom MIS-C should be considered, including:

- Age < 21 years, AND
- Fever ≥ 38.0 for ≥ 3 days or ≥ 1 day if ill-appearing, AND
- Presence of ≥ 3 symptoms from any or all categories reported with MIS-C **(See Table 1),** AND
- No alternative plausible diagnosis

OR

- Patients in whom there is concern for Kawasaki disease (KD)

Exclusion Criteria:

Patients who do not meet all of the inclusion criteria

↓

Evaluate for other appropriate diagnosis

Table 1. MIS-C Presenting Symptoms from Case Reports

Category	Presenting Symptom
Systemic	Fever (median duration 4 days)
	Myalgia
	Lymphadenopathy
	Shock
Mucocutaneous	Rash/skin desquamation
	Conjunctivitis
	Lip redness / swelling
Respiratory	Cough
	Dyspnea
	Hypoxia
Cardiovascular	Myocardial dysfunction
Gastrointestinal	Abdominal pain
	Vomiting
	Diarrhea
Renal	Acute Kidney Injury
Neurologic	Headache
	Lethargy
	Confusion
	Stiff neck
	Vision changes
Musculoskeletal	Swollen hands & feet

Centers for Disease Control and Prevention (CDC) definition of MIS-C includes:

- ✓ Age < 21 years
- ✓ Fever ≥ 38.0 for ≥ 24 hours
- ✓ Laboratory evidence of inflammation
- ✓ Organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological)
- ✓ No alternative plausible diagnoses
- ✓ Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or COVID-19 exposure within the 4 weeks prior to the onset of symptoms

Evaluation

Lab

- ❑ SARS CoV-2 RT-PCR NP Swab AND SARS-Co-2 antibody – IgG
- ❑ Respiratory Pathogen PCR Panel
- ❑ Tier-1: Blood work: CBCD, CMP, CRP, ESR, coagulation studies with D-dimer, blood culture
- ❑ If patient in shock, send Tier-2 labs on initial evaluation
- ❑ Tier-2: If abnormal ESR, CRP or CBCD (ALC < 1000, Plt <150 K), then send ferritin, pro-BNP, troponin
- ❑ Consider saving Mint gel top if further testing required
- ❑ Consider urinalysis and urine culture if concern for urinary tract infection
- ❑ For severe MIS-C (See Page 2, Table 2) , consider obtaining triglycerides, LDH, Cytokine levels, soluble IL-2, NK Cell function

EKG

- ❑ Obtain for all patients that meet CDC criteria for MIS-C

Echo

- ❑ Perform if there is fever and any of the following:
  - o Hemodynamic instability
  - o Elevated troponin or pro-BNP
  - o Abnormal EKG
  - o Suspicion for complete/ incomplete KD

Echo should evaluate:

- ✓ Coronaries: left main, proximal and distal left anterior descending, proximal and distal right, and posterior descending coronary arteries for dilation, course (tapering or not tapering), aneurysm, echo bright walls, thrombus
- ✓ Valvar function
- ✓ Ventricular function
- ✓ Pericardial effusion

Other

- ❑ Perform other organ specific evaluation based on patient's presenting symptoms
  - o GI: Other infectious studies, KUB, abdominal ultrasound or CT
  - o Neuro: Head imaging-CT/MRI, LP, EEG

Owner: Saraswati Kache, Hayden Schwenk
Pathway Team: Roshni Mathew, Dana Gerstbacher, Rebecca Ivancie, Clara Lo, May Chien, Shiraz Maskatia, Seda Tierney, Dan Imler, Jeff Moss
Last Updated: 10/6/2020
Associated Orderset: Heparin Infusion (Therapeutic) order set
Associated Policies: n/a

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Multisystem Inflammatory Syndrome in Children (MIS-C) Pathway

Disposition

Determine patient disposition based on initial presentation and work-up	
Discharge home with PCP follow up	Well appearing patient and not meeting other admission criteria
Possible hospital admission	Any of the following: ❑ ESR ≥ 40 ❑ CRP ≥3 ❑ Lymphopenia < 1K ❑ Thrombocytopenia < 150K
Hospital admission	Any of the following: ❑ Unstable vitals ❑ Requires ongoing resuscitation ❑ Meets criteria for admission: e.g. oxygen, IV fluids or IV medications ❑ Concerns for KD
Transfer to higher level of care	❑ Hospital *without* inpatient pediatric service: Transfer to LPCH upon diagnosis of MIS-C ❑ Hospital *with* inpatient pediatric service: Transfer to Children's hospital if patient with moderate to severe MIS-C and / or signs of end organ injury (See table below)

Inpatient Management

Management Strategy (See Page 3 for other management considerations)

Disease	COVID-19 associated KD-like illness	MIS-C		
		Mild	Moderate	Severe
Definition	Meets criteria for complete/incomplete KD but without shock or multisystem involvement	NO vasoactive support Minimal organ injury	*VIS ≤ 10 Mild or single organ injury	*VIS > 10 Severe organ injury or multi-organ involvement
Medications				
Methylpred-nisolone	NA	**Consider 2 mg/kg/day tapered over 2 weeks	2 mg/kg/day tapered over 2 -4 weeks	30 mg/kg/day (max 1,000 mg) x 3 days followed by 2 mg/kg tapered over 4-6 weeks
IVIG	2 g/kg IV over 12-18 hours (max dose 100 grams)	**Consider 2 g/kg IV over 12-18 hours (max dose 100 grams)	2 g/kg IV over 12-18 hours (max dose 100 grams)	2 g/kg IV over 12-18 hours (max dose 100 grams)
Aspirin	30-50 mg/kg/day divided q6hr until defervescence After defervescence: low dose (3-5mg/kg/day; max 81 mg/day) until confirmed normal coronary arteries at ≥4 weeks after diagnosis Hold if platelet count <50K	NA	NA	NA
Interleukin Antagonists	NA		Anakinra (IL-1 R inhibitor) 2-4 mg/kg subQ or IV daily (max 100 mg/day)	Anakinra (IL-1 R inhibitor) 10 mg/kg subQ or IV daily to q6 (max 100 mg/day) If refractory to Anakinra (persistent fever or ferritin > 1,000), change to Tocilizumab (IL-6 inhibitor) if weight < 30 kg 12 mg/kg IV, if weight > 30 kg 8 mg/kg IV (max 800mg)
Other	NA	Consider treatment for sepsis	Consider treatment for septic shock	Consider treatment for septic shock
Consults				
	▪ Required: Infectious Disease, Cardiology ▪ Rheumatology: if considering steroids or infliximab	▪ Required: Infectious Disease, Cardiology, Rheumatology ▪ Hematology: if extra-cardiac thrombosis or considering low molecular weight heparin ▪ Nephrology: for fluid-unresponsive acute kidney injury ▪ Dermatology (optional for diagnostic purposes)		

***Vasoactive-Inotropic Score (VIS)** = dopamine dose (μg/kg/min) + dobutamine dose(μg/kg/min) + 100 x epinephrine dose (μg/kg/min) + 10 x milrinone dose (μg/kg/min) + 10,000 x vasopressin dose (U/kg/min) + 100 x norepinephrine dose (μg/kg/min)

** Patients who have defervesced and have improving clinical and laboratory parameters may not need either IVIG or steroids.

Multisystem Inflammatory Syndrome in Children (MIS-C) Pathway

Inpatient Management

Other Management Considerations

Antimicrobials

Antivirals

In consultation with Pediatric Infectious Diseases, remdesivir may be considered for patients with suspected/confirmed MIS-C on a case-by-case basis, although the role of antiviral medications is not clear in this setting.

Antibiotics

Children with suspected/confirmed MIS-C who meet the criteria for septic shock should receive broad spectrum antibiotics per the LPCH Severe Sepsis/Septic Shock Pathway. For children with features of toxic shock syndrome, the addition of clindamycin can be considered. Antibiotics should otherwise be directed towards any infectious conditions present at the time of MIS-C diagnosis (e.g., ceftriaxone and vancomycin for patients with suspected meningitis). The rate of bacterial co-infection in children with MIS-C appears to be very low. Antibiotic use should be re-evaluated daily, and, if there is no evidence of bacterial infection, antibiotics should be de-escalated or discontinued.

Anticoagulation

Prophylactic

- ≥ 14-18 years of age: Consider prophylactic anticoagulation
- > 18 years of age: Recommend prophylactic anticoagulation
- Risk factors: malignancy, critical illness, obesity, pre-existing inflammatory disease, history of thrombosis, inherited thrombophilia, sickle cell disease, immobility, indwelling central lines
- Echocardiogram findings of concern: left atrial spontaneous echo contrast ("smoke") or left ventricular noncompaction cardiomyopathy
- Contraindications: active bleeding, platelet count < 50,000

Prophylactic anticoagulation regimen:

- < 50 kg: enoxaparin 0.5 mg/kg subQ q12h
- ≥ 50 kg enoxaparin 40 mg subQ q24h

Monitoring:

Consider checking anti-Xa level with goal 0.2-0.4 IU/ml for patients with renal disease, cardiac disease, or BMI > 40 kg/m^2

Therapeutic

- From existing data, thus far MIS-C has not been associated with an increased incidence of thrombosis. We do not recommend empiric therapeutic anticoagulation in children with MIS-C.
- Consider therapeutic anticoagulation in case of:
  - Thrombosis documented, and/or
  - Large and giant coronary aneurysms (coronary dimensions adjusted for BSA (z scores) > 10)
- Contraindications: active bleeding, platelet count < 50,000

Therapeutic anticoagulation plan (use either enoxaparin or unfractionated heparin):

Enoxaparin

- 1 mg/kg subQ q12h
- anti Xa goal 0.5-1.0 IU/ml
- Anti-Xa level should be drawn 4 hours after third or fourth dose

Unfractionated Heparin

- Administer & titrate per heparin order set
- Heparin activity level (HAL) goal 0.3-0.7 U/ml

Supportive Care

Respiratory Support

- Given available adult data, early intubation is not required in COVID-19 patients. Patients appear to present as comfortably tachypneic.
- Intubation should be considered if progressive hypoxemia, altered mental status, or continued increased work of breathing is noted on NIPPV.
- Patients should have respiratory support escalated per standard of practice and as listed below:
  - Routine nasal cannula →High Flow Nasal cannula →CPAP →BiPAP →Invasive ventilation. See attachment
- Refer to attachment for further information.
- Positive end expiratory pressure (PEEP) considerations: experience in adult COVID-19 patients in Italy does not advise the use of higher PEEP routinely which varies from previous recommendations of PEEP use in acute respiratory distress syndrome (ARDS). In the early phase of respiratory failure with COVID-19, the lung compliance is relatively maintained. Therefore, applying low PEEP and accepting lower oxygen saturations (80's to 90's) may be advised if the patient has single organ failure of the lungs. In the later phase, the pathophysiology may change to typical ARDS requiring a higher PEEP. Individualized titration of PEEP is recommended.

Shock Management

- Provide volume resuscitation: administer 10-20 ml/kg up to a maximum of 40-60 ml/kg as long as patient remains fluid responsive without signs of fluid overload; administer each bolus over 10-30 minutes. Lower volume resuscitation may prevent need for invasive ventilatory support. For patients with LV dysfunction, administer 5-10 ml/kg fluid boluses.
- Initiate inotropic support, per standard practice with epinephrine or norepinephrine, if the patient remains hypotensive.

Neither Stanford Children's Health, the pathway authors, nor any other involved parties, can guarantee pathway content is entirely accurate and complete. They are not responsible for any errors or undesirable outcomes which may occur from the use of a pathway.

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Multisystem Inflammatory Syndrome in Children (MIS-C) Pathway

Monitoring and Discharge

Inpatient Monitoring and Follow-up

Pediatric Intensive Care Unit (PICU)

- Weekly electrocardiogram
- Weekly echocardiogram
- More frequent echocardiograms may be considered if:
  - On inotrope support
  - Worsening clinical status

Acute Care Inpatient Ward

- Bedside monitor, telemetry
- Weekly electrocardiogram
- Weekly echocardiogram until discharge
- Additional echocardiography:
  - Worsening clinical status prompting a change in management
  - Per Cardiology recommendation for patients with specific cardiac findings

PICU Discharge Criteria

Patient does not require either:

- Respiratory support above simple nasal cannula, OR
- Inotropic support

Post Discharge Follow-up

Post-Discharge Follow-up

- Primary care physician within 1 week
- Infectious Disease (case-by-case basis)
- Rheumatology (2 weeks post-discharge, if on steroid taper)
- Cardiology:
  - 2 weeks after diagnosis with clinical evaluation, electrocardiogram and echocardiogram if patient is:
    - COVID-19+ (PCR or serology) and inflammatory syndrome present with coronary ectasia/aneurysm(s)/myocardial involvement, OR
    - COVID-19+ (PCR or serology) and KD diagnosis
  - 4-6 weeks after diagnosis with clinical evaluation, electrocardiogram and echocardiogram if patient is:
    - COVID-19+ (PCR or serology) and inflammatory syndrome present, BUT with no coronary or other cardiac involvement

Hospital Discharge Criteria

Patient demonstrates all the following:

- Improved/stable respiratory symptoms without need for oxygen support
- Adequate oral/enteral fluid intake without need for IV fluids
- No need for IV medications
- Patient / family receives education on:
  1. Quarantine practices
  2. Reasons to seek medical attention
  3. Treating fevers primarily with Tylenol
  4. Assuring access to masks

Additional Names of Syndrome:

Multisystem inflammatory syndrome in children (MIS-C) is also referred to as pediatric multisystem inflammatory syndrome (PMIS), pediatric inflammatory multisystem syndrome (PIMS), pediatric hyperinflammatory syndrome, or pediatric hyperinflammatory shock.

Differences between Kawasaki disease and MIS-C:

1. **Age of presentation** – MIS-C presents in older children compared with Kawasaki disease (7 years vs 3 years).
2. **Race/Ethnicity** – There is an increased incidence of MIS-C in patients of African, Afro-Caribbean, and possibly Hispanic descent, but a lower incidence in those of East Asian descent.
3. **Gastrointestinal symptoms** – Compared to Kawasaki disease patients, MIS-C patients more commonly have GI symptoms at presentation and can be severe.
4. **Cardiac dysfunction and shock** – While shock presents in 5% of Kawasaki disease, shock and myocardial dysfunction has been more common in MIS-C (30-80%).
5. **Laboratory abnormalities** – MIS-C patients have significantly elevated troponin I and brain natriuretic peptide, higher inflammatory markers (D-dimer, CRP, ESR, IL-6), lower absolute lymphocyte count, and thrombocytopenia instead of thrombocytosis compared with patients with Kawasaki disease.

Pathways never replace or supersede physician or advanced practice provider orders. Neither Stanford Children's Health, the pathway authors, nor any other involved parties, can guarantee pathway content is entirely accurate and complete. They are not responsible for any errors or undesirable outcomes which may occur from the use of a pathway.

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REVIVE

PALS

The American Heart Association (AHA) Training Center at Stanford Children's Health was established in 1989 as the first AHA Training Center in the state of California. The Pediatric Advanced Life Support program was implemented by pediatric intensivist Lorry Frankel, MD. Currently, more than 1,500 participants attend our Pediatric Advanced Life Support (PALS) and Basic Life Support courses. These courses include facilitated simulations involving pediatric medical management of shock, respiratory distress/failure, cardiac arrest, and pediatric trauma. In 2006, Stanford Children's Health was recognized by the American Heart Association as one of the first training centers that integrated simulation in an AHA PALS course. Our courses are taught by leading cardiologists, Pediatric Intensive Care Unit (PICU) intensivists, PICU and Cardiovascular Intensive Care Unit nurses, critical care transport nurses, and resuscitation experts in the field. This course always receives excellent feedback and attracts attendees from all over the nation.

PAWWS

The Pediatric Advanced Workshop with Simulation (PAWWS) program was developed in 2006 by John Kammeyer, EMS fire chief; Michael Jacobs, EMS pre-hospital coordinator; and Lynda Knight, director of REVIVE Initiative for Resuscitation Excellence, with the objective of improving the continuum of care between the management of pre-hospital and in-hospital pediatric care. The course was originally designed to be provided to Bay Area firefighters on alternate years of their PALS certification, but in recent years, Menlo Park EMS has requested to have this course facilitated every year in order to improve confidence, competence, and their first responders' management of pediatric patients for Menlo Park Fire. The course utilizes actual past pediatric EMS events that have occurred in the county, employing simulation and a facilitated debriefing with video playback to reinforce best pediatric practices, uncover latent errors, and identify any opportunities for improvement.

Stanford Children's Health has been able to share pediatric best practices in emergency management and implementing pediatric emergency equipment to be used by firefighters. The cases covered expose participants to pediatric medical management, cardiac arrest, and trauma to reduce patient deterioration in a medical emergency of cardiac arrest or trauma. The course emphasizes review and practice of pediatric processes and emergency equipment. The course also examines the latest EMS protocols and procedures. Most recently, firefighters are no longer able to intubate patients who are younger than 8 years old. PAWWS-created cases that were quite challenging for firefighters, however, gave them the opportunity to troubleshoot alternative interventions that are within their protocols, to ensure that they are able to improve the quality of care provided. Since the program's implementation, it has been attended by hundreds of San Francisco Bay Area firefighters from San Bruno to Menlo Park.

> "The course examines the latest EMS protocols and procedures."

Area hospitals

The Revive Initiative for Resuscitation Excellence at Stanford Children's Health has facilitated simulation training involving cardiac arrest, trauma, and pediatric medical management at area hospitals, including ICUs at John Muir Health and CPMC as well as Watsonville Community Hospital. Most recently, Revive has conducted outreach at Packard Children's Health Alliance clinics to integrate simulation and education. Revive also conducts outreach at Watsonville Community Hospital in its emergency rooms and neonatal wards. Additionally, Revive conducts simulation training at Stanford Health Care's Emergency Department with pre-hospital trauma coordinators and hospital teams to improve care and identify system errors. The cases utilized are based on pediatric events that have previously occurred at Stanford Children's Health, and they are reviewed and selected by Resuscitation Oversight Committee (ROC) and Patient Safety.

> "Revive conducts simulation training to improve care and identify system errors."

Inpatient Consults and Transfers

The Transfer Center at Lucile Packard Children's Hospital Stanford is standing by to help with inpatient consultations and interfacility transfers. Our team of transfer center specialists are available 24/7 to assist in coordinating neonatal, pediatric, and obstetrical transfers, as well as inpatient consultation needs.

To initiate a patient transfer and/or to consult with a Packard Children's specialist, please call (650) 723-7342.

Please have the following information available with the initial request:

- Patient's name and location
- Date of birth
- Chief complaint or diagnosis
- Referring physician's full name and best contact number
- Face sheet ready and available for faxing upon request to (650) 498-6229

Questions or concerns about the Lucile Packard Children's Hospital Stanford Transfer Center? Please contact:

Kat Cueto, MSN, RN-BC, CNS
Director of Clinical Access
(650) 721-5770
kcueto@stanfordchildrens.org

For questions or concerns related to our COVID-19 plan, please see our web page. Information is updated daily and includes content for families and providers. Covid.stanfordchildrens.org