UT SOUTHWESTERN MEDICAL CENTER

COVID-19 CLINICAL ROUNDS: PEDIATRIC CRITICAL CARE

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Disclosure

- I have nothing to disclose.

Pediatric Critical Care: COVID-19 and MIS-C

- ICU level cases of SARS-CoV-2 infection—May 2020
- Steady stream of admissions with peak PICU census of 7-8 patients/daily now declining
- Creation of a COVID-19 pod within our ICU
- 3-4 weeks later: Multi-System Inflammatory Syndrome in Children (MIS-C)
- Presentation is extremely variable
  - 2 cases today demonstrate the range of disease
- Children with both illnesses continue to trickle in

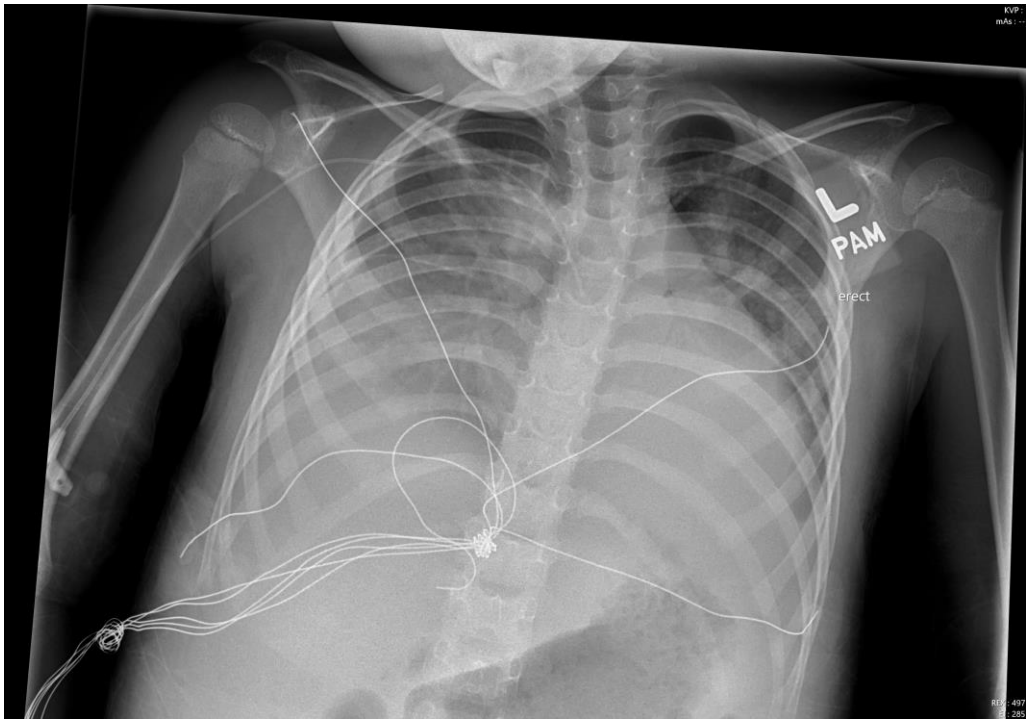
Case #1: 5-year old male

- Previously completely healthy, except 34-week prematurity
- Presented with:
  - 5-day history of fever and fatigue
  - Diagnosed with strep pharyngitis by PCP-started on Amoxicillin
  - Mild abdominal pain and vomiting
  - Rash, eye redness, cracked lips
  - Chronically enlarged cervical nodes
  - No sick contacts, no h/o exposure to COVID
- Admitted to general ward service but transferred to PICU after 12 hours with shock

Case, cont'd.

- Before arriving in the PICU, 100cc/kg of fluid resuscitation
- On epinephrine and norepinephrine infusions
  - ECHO without coronary dilation/aneurysm
- Acute kidney injury and oliguria
- Persistent RUQ pain—U/S shows hydrops of the gallbladder
- Labs suggest MIS-C: elevated BNP, elevated D-dimer and ferritin, high CRP and ESR, low platelets

Acute respiratory failure on day 2-3 of hospital course



- Progressive respiratory insufficiency
- Managed with non-invasive positive pressure support
- Pleural effusion and inc. vascularity

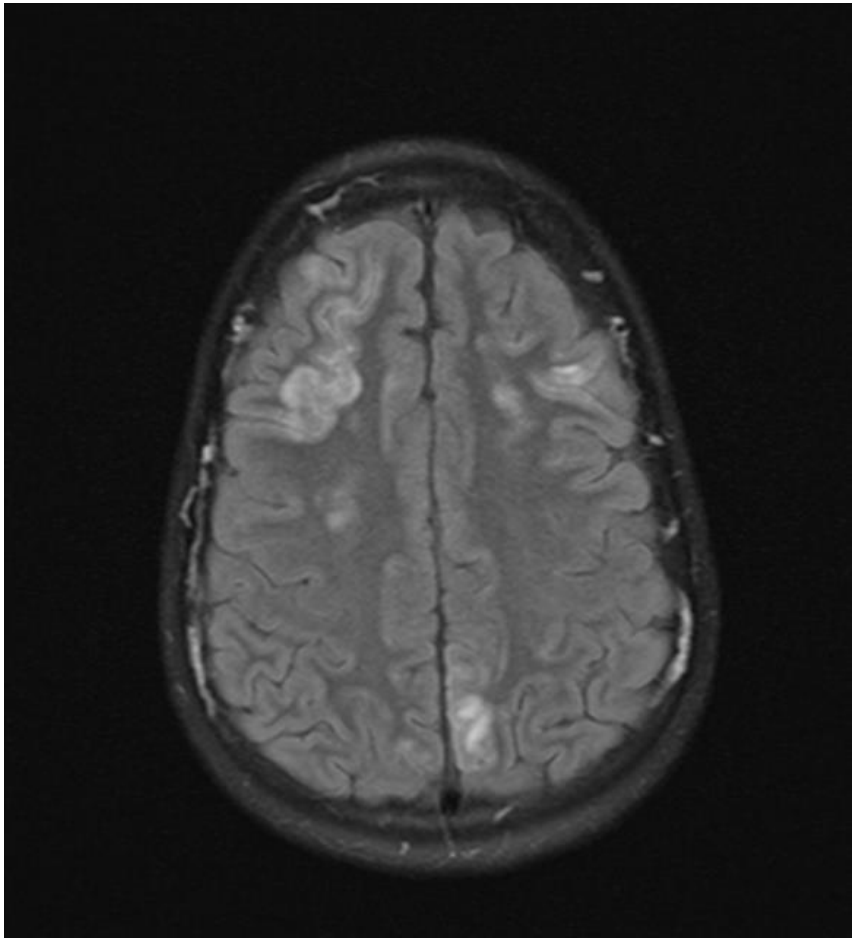
Case 1: diagnosis & treatment

- Was this Kawasaki or MIS-C??
  - COVID-19 antibody test (IgG) was positive
- Broad empiric antibiotic coverage
  - All cultures remained negative
- Treated with high dose steroids, IVIG
- Aggressive diuresis after shock reversed
- Enoxaparin for venous thrombosis prophylaxis—aspirin at discharge
- Follow up with cardiology, rheumatology, hematology

Case 2: 11-year old male

- 11yo previously healthy male admitted 1 week after uncomplicated SARS-CoV-2 infection
- High fever →105
- Cardiogenic shock-ECHO with depressed function and coronary artery dilation
- Acute respiratory failure
- 11-day hospital course with clear signs of MIS-C
  - Elevated ESR, CRP, D-dimer + all organ injury
- Treated with steroids and IVIG and enoxaparin
- Returns 2 weeks later with abdominal pain, vomiting, r/o appendicitis
- Neurologic decompensation night 1—onset of seizures
  - Emergent intubation, brief CPR, transfer to ICU

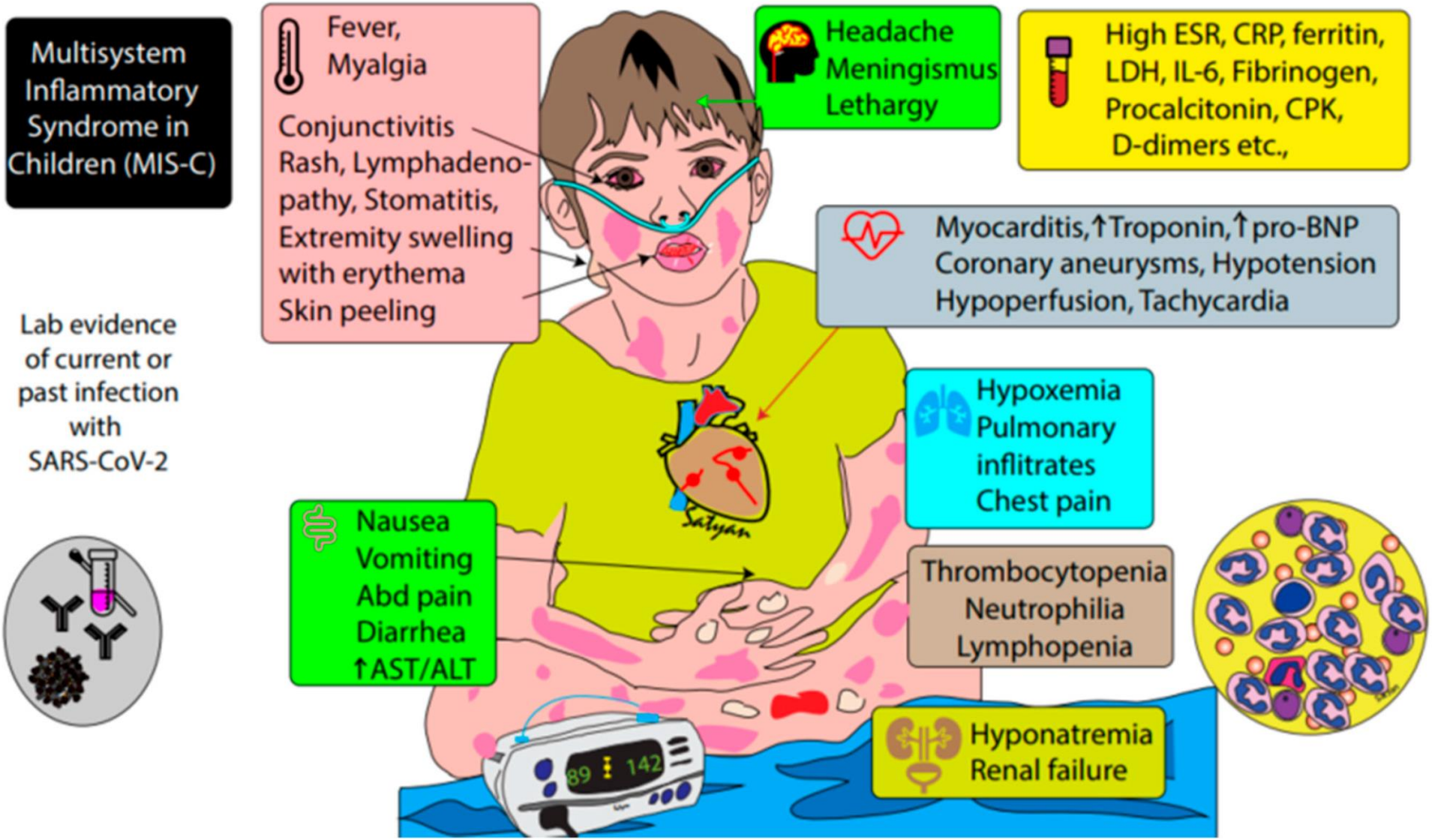
MRI abnormalities



- Scattered foci of cortical edema in bilateral frontal, right temporal, left parietal lobes-PRES?
- But only mild hypertension
- Vasculitis?

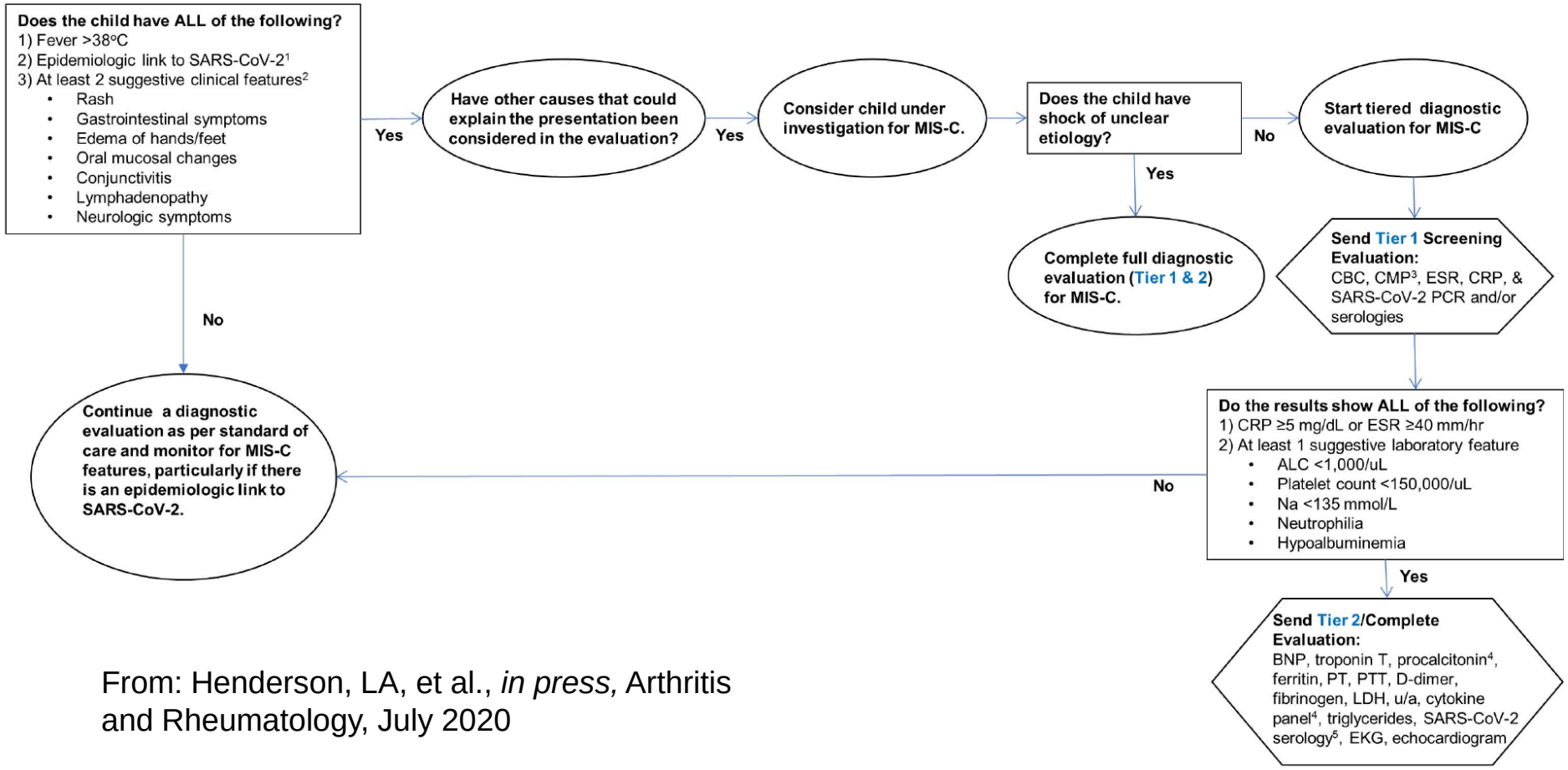
Not all MIS-C looks alike

Presentations: cardiogenic shock, appendicitis, respiratory failure, neurologic decompensation



- Adapted from CDC

Does my patient have MIS-C?



From: Henderson, LA, et al., *in press,* Arthritis and Rheumatology, July 2020

American College of Rheumatology Task Force

- Convened a group of experts: inclusive
  - 9 peds rheum, 2 cardiology, 1 ICU, 2 adult rheum
- Goals:
  - Provide clinical guidance, not guidelines
  - Target audience: pediatricians, pediatric specialists
- Based on scant evidence—creation of a “living” document that will be updated as evidence emerges
- Webinars and voting on strength of each recommendation
- 40 guidance statements

Kawasaki disease vs. MIS-C

- ¼ to ½ of MIS-C meet full criteria for KD
- Broad age distribution of MIS-C including many teens (KD usually younger <5)
- Presentation with shock unusual in KD
- Associated GI and neuro features less frequent in KD
- MIS-C—low platelets, higher CRP/ESR, lower lymph counts

Therapy for MIS-C patients requiring ICU care

- General supportive care for organ dysfunction
- ECHO at presentation, repeat at 7-14 days
- Stepwise use of immunomodulatory treatment
  - IVIG or glucocorticoids as first line
  - May use in combination
  - Anakinra for patients who are refractory to above (or consideration of IL-6 blockade)
- Anti-platelet or anti-coagulation therapy
- Study is ongoing-BATS-Best Available Treatment Study