Multisystem Inflammatory Syndrome in Children (MIS-C)

Diana W. Bianchi, M.D.

June 11, 2020

NIH *Eunice Kennedy Shriver* National Institute of Child Health and Human Development

Acknowledgments

Co-Chair: Gary Gibbons, NHLBI

- Karyl Barron, NIAID
- Elizabeth Baden, NICHD
- Nancy Bridges, NIAID
- Alison Cernich, NICHD
- Jessica Chertow, NHLBI
- Valerie Cotton, NICHD
- James Coulombe, NICHD
- Ellen Goldmuntz, NIAID
- Rohan Hazra, NICHD
- Jessica Hostetler, NHLBI
- Patrick Jean-Philippe, NIAID
- Jonathan Kaltman, NHLBI
- Bill Kapogiannis, NICHD
- Luigi Notarangelo, NIAID
- Dina Paltoo, NHLBI
- Aaron Pawlyk, NICHD
- Gail Pearson, NHLBI
- Lisa Ryder, NIEHS
- Nina Schor, NINDS
- Megan Shaheen, NHLBI
- Bob Tamburro, NICHD
- Perdita Taylor-Zapata, NICHD
- N-PeRC COVID-19 working group
- Office of the Assistant Secretary for Health, HHS
  - Shahla Jilani
- CDC colleagues
  - Manish Patel
- And others!

Multisystem Inflammatory Syndrome in Children (MIS-C)

Coronavirus Live updates U.S. map World map Reopening tracker Lives lost Your life at home Your money

Health

Children are falling ill with perplexing inflammatory syndrome thought to be linked to covid-19

Number of cases remains small, but officials are on high alert because of severity

Health

Young adults are also affected by Kawasaki-like disease linked to coronavirus, doctors say

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Search Coronavirus Advanced Search

Coronavirus Disease 2019 (COVID-19)

CDC > Coronavirus Disease 2019 (COVID-19) > Daily Life & Coping > Caring for Children

Coronavirus Disease 2019 (COVID-19)
Symptoms
Testing

For Parents: Multisystem Inflammatory Syndrome in Children (MIS-C) associated with COVID-19

Other Languages Print Page

EurekAlert! AAAS

HOME COVID-19 NEWS RELEASES MULTIMEDIA MEETINGS PORTALS ABOUT

NEWS RELEASE 28-APR-2020

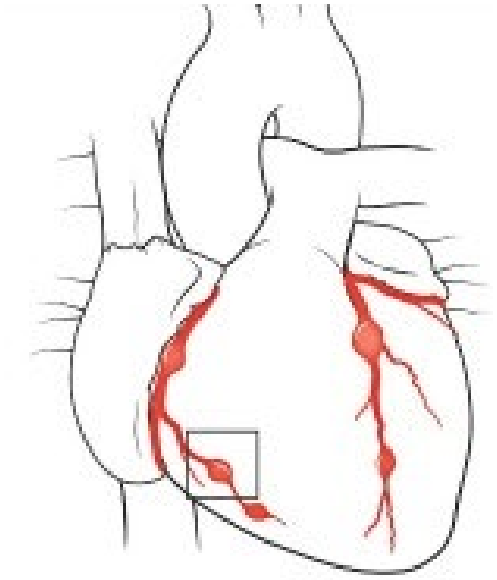
Boston Children's Hospital to lead nationwide study on COVID-19 in children

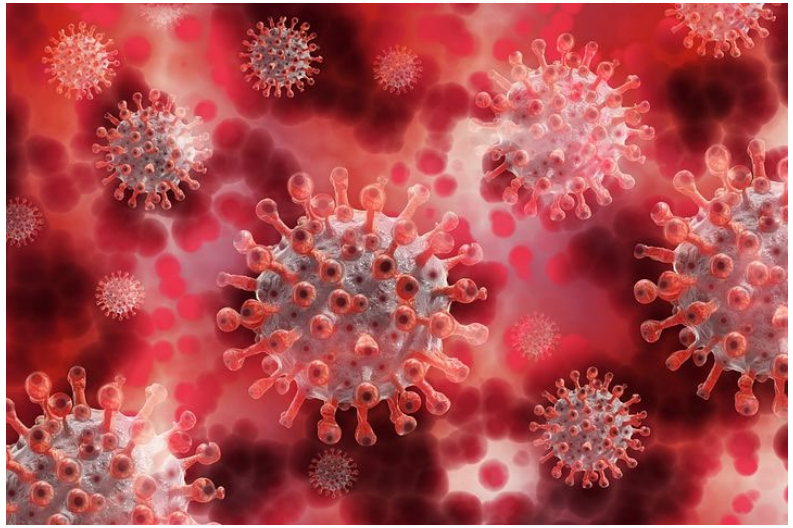
CDC-funded study will seek factors that increase vulnerability to the novel coronavirus

BOSTON CHILDREN'S HOSPITAL

MIS-C Clinical Presentation

- Fever (≥38.0°C for ≥24 hours)
- Laboratory evidence of inflammation
- Clinically severe illness requiring hospitalization, with multisystem (≥2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological)
- Positive for current or recent SARS-CoV-2 infection or COVID-19 exposure within prior 4 weeks
- Observed variations
  - Full blown MIS-C (critically ill, in ICU)
  - Milder version of MIS-C (hospitalized, but not in ICU)
  - Significant respiratory involvement
  - Classic Kawasaki disease





Research Platform to Understand MIS-C

AT-RISK PEDIATRIC COVID-19 COHORT
Goal: Large cohort to advance understanding of pediatric SARS-CoV-2 spectrum of illness

LONG-TERM FOLLOW UP
Goal: Ascertain outcomes, treatment effects, and long term, multisystem complications of MIS-C

MIS-C COHORT PLATFORM
Goal: Comprehensive understanding of phenotypes, natural history, outcomes, pathobiology of MIS-C

Streamlined common data protocol, collection, robust cloud-based data sharing

MIS-C COHORT PLATFORM

Goal: Comprehensive understanding of phenotypes, natural history, outcomes, pathobiology

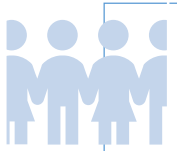
Longitudinal follow-up (e.g., echo core lab)

Adaptive design trials and trial prep (PK/PD studies)

Deep phenotyping: WGS, RNA seq, Antibody profiling, etc.

Data platform to support access and computation

Data Coordinating Center to aggregate data



Leveraging and linking existing cohorts and networks

Pediatric Trials Network

- Purpose: Gather information on pharmacokinetics and safety of several drugs not typically used in children to define appropriate dosing of these drugs for COVID-19
- Incorporated opportunistic study of six drugs into an existing protocol:
  - Azithromycin, Chloroquine, Hydroxychloroquine, Lopinavir/Ritonavir, Ribavirin, and Tocilizumab
  - Can add more as they are implemented into care of children
- Partnered with nearly 50 study sites across the country to collect blood samples to
  - Characterize pharmacokinetics of these drugs across the pediatric age range
  - Collect information on drug safety and clinical course (e.g., date(s) of positive testing; duration and type of respiratory support; duration of hospitalization; mortality)
  - Develop partnerships with PIs around the country who are exploring the safety and efficacy of hydroxychloroquine and/or azithromycin

AT-RISK PEDIATRIC COVID-19 COHORT

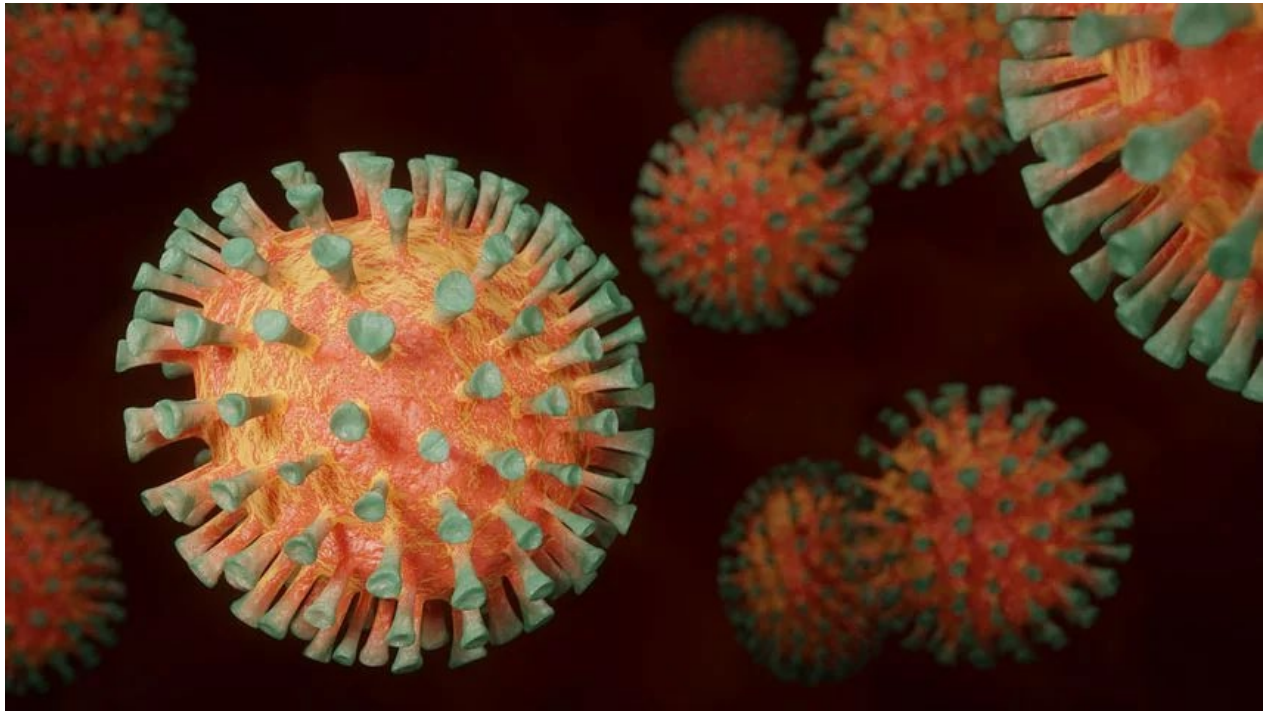
Goal: Large cohort to advance understanding of pediatric SARS-CoV-2 spectrum of illness

- Up to 10,000 SARS-CoV-2 positive children and adolescents
- Build on existing clinical trial network infrastructures
- Basic genetic and immunophenotyping studies
- Use EHRs, minimal testing and case report forms
- Control group for MIS-C and those who develop severe but typical COVID-19
- Smaller group with COVID-19: deep phenotyping and more extensive clinical data to understand disease manifestations and progression
- Leverage RADx PREVAIL study: develop novel or non-traditional approaches (e.g., diagnostic and prognostic biomarkers) to identify and characterize the spectrum of MIS-C and predict the longitudinal risk of disease severity after SARS-CoV-2 exposure

LONG-TERM FOLLOW UP STUDY

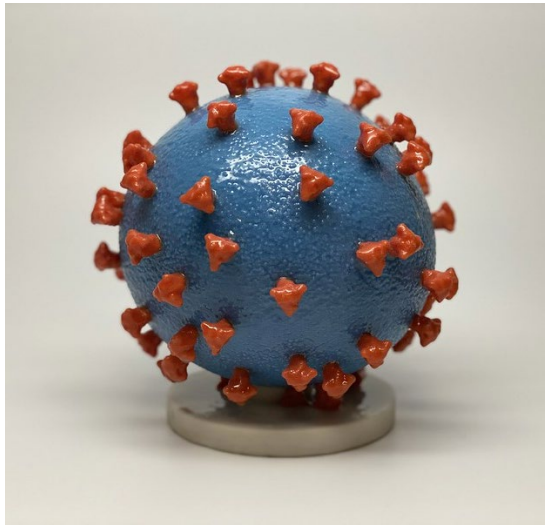
Goal: Ascertain outcomes, treatment effects, and long term, multisystem complications of MIS-C

- Multi-system testing (e.g., cardiac, neurological, GI, respiratory)
- Immunological testing
- Immune response and vaccine considerations



COVID-19 and Pregnancy

- NICHD's Maternal Fetal Medicines Unit (MFMU) launched a study
  - Currently can support enrollment of 21,000 pregnant women over 12 sites
  - Goal is to compare overall antenatal care, maternal health complications, rates of C-sections and maternal mortality in pre- and post- COVID-19 eras
  - Includes natural history study of 1,500 COVID-19+ pregnant women
  - Developed common data elements (CDEs) with other NICHD networks
  - Encouraging other registries adopt these CDEs to aid future meta-analyses
- Discussions occurring with outside organizations for potential collaborations on registry efforts for pregnant women and newborns
- Advocating for inclusion of pregnant women and children in major trans-NIH initiatives such as ACTIV and RADx that involve clinical trials of therapeutic vaccines and rapid testing



Questions?