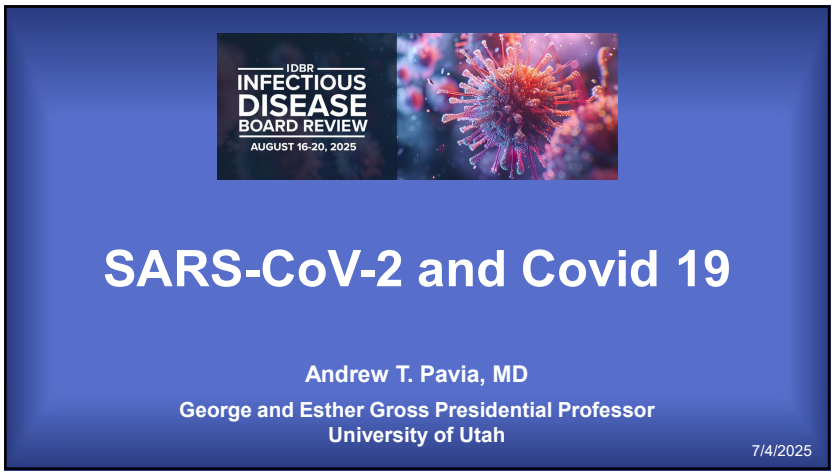

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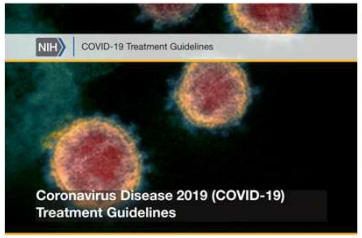
2

What Seems Testable

- Disease course
  - High risk groups
- Diagnosis
  - NAAT, antigen, serology
- Treatment recommendations
- Vaccine complications
  - Myocarditis
- MIS-C/A
- Probably not vaccine recommendations (currently too political), variants (too changeable), long covid (no proven therapy

3



Roy M Gulick 1, Alice K Pau 2, Eric Daar 3, Laura Evans 4, Rajesh T Gandhi 5, Pablo Tebas 6, Renée Ridzon 2, Henry Masur 2, H Clifford Lane 2; NIH COVID-19 Treatment Guidelines Panel; Adaora A Adimora, Jason Baker, Lisa Baumann Kreuziger, Roger Bedimo, Pamela Belperio, Anoopindar Bhalla, Timothy Burgess, Danielle Campbell, Stephen Cantrill, Kara Chew, Kathleen Chiotos, Craig Coopersmith, Richard Davey, Amy Dzierba, Derek Eisnor, Gregory Eschenauer, Joseph Francis, John Gallagher, David Glidden, Neil Goldenberg, Birgit Grund, Alison Han, Erica Hardy, Carly Harrison, Lauren Henderson, Elizabeth Higgs, Carl Hinkson, Brenna Hughes, Steven Johnson, Marla Keller, Arthur Kim, Richard Knight, Safia Kuriakose, Jeffrey Lennox, Andrea Lerner, Mitchell Levy, Jonathan Li, Christine MacBrayne, Greg Martin, Nandita Nadig, Martha Nason, Pragna Patel, Andrew Pavia, Michael Proschan, Grant Schulert, Nitin Seam, Virginia Sheikh, Steven Simpson, Kanal Singh, Susan Swindells, Phyllis Tien, Timothy Uyeki, Alpana Waghmare, Cameron Wolfe, Jinoos Yazdany, Judith Aberg

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https://wayback.archive-it.org/4887/20240626155208/https://www.covid19treatmentguidelines.nih.gov/

IDSA PRACTICE GUIDELINES · CURRENT

IDSA Guidelines on the Treatment and Management of Patients with COVID-19

Published August 12, 2024 **Last Updated** January 23, 2023

(as of spring 2024) Adarsh Bhimraj, Yngve Falck-Ytter, Arthur Y. Kim, Jonathan Li, Lindsey R. Baden, Steven Johnson, Robert W. Shafer, Shmuel Shoham, Pablo Tebas, Roger Bedimo, Vincent Chi-Chung Cheng, Kara Chew, Kathleen Chiotos, Eric Daar, Amy L. Dzierba, David V. Glidden, Erica J. Hardy, Greg S. Martin, Christine MacBrayne, Nandita Nadig, Mari M. Nakamura, Amy Hirsch Shumaker, Phyllis Tien, Jennifer Loveless, Rebecca L. Morgan, Rajesh T. Gandhi

(prior to spring 2024) Adarsh Bhimraj,* Rebecca L. Morgan,** Amy Hirsch Shumaker, Lindsey Baden, Vincent Chi-Chung Cheng, Kathryn M. Edwards, Jason C. Gallagher, Rajesh T. Gandhi, William J. Muller, Mari M. Nakamura, John C. O'Horo, Robert W. Shafer, Shmuel Shoham, M. Hassan Murad,** Reem A. Mustafa,** Shahnaz Sultan,** Yngve Falck-Ytter**

https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management/

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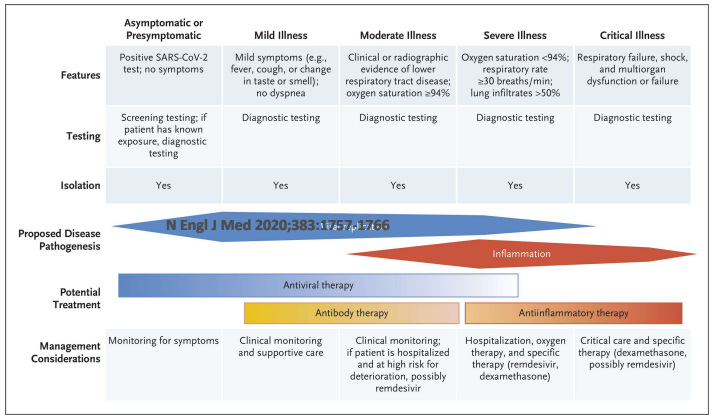

Gandhi. N Engl J Med 2020;383:1757-1766

5

Diagnostics

- NAAT most sensitive and specific.
  - May remain positive for weeks
- Antigen detection. Highly specific but lower sensitivity, especially early
- Serology. IDSA recommends against for diagnosis of acute disease
  - Antibody to spike detects vaccination and infection
  - Persists. No correlate of protection for binding antibody
  - Antibody to nucleocapsid reflects infection
- Antibody testing may be helpful in MIS-C/A

6

Question #1

PREVIEW QUESTION

IDBR INFECTIOUS DISEASE BOARD REVIEW 2025

- A 35-year-old woman presents to your ED because she tested positive for Covid-19 at home. She is coughing, fatigued and has a low-grade fever
- She is 30 weeks pregnant. She has familial hypercholesterolemia and her BMI is 36
- You find out she had Covid vaccine in the summer of 2020 (5 years ago) but has not had a booster nor a known infection since
- She is febrile and uncomfortable. Her exam is otherwise unremarkable
- O2 saturation 95% on room air

7

Question #1

PREVIEW QUESTION

IDBR INFECTIOUS DISEASE BOARD REVIEW 2025

What is the most appropriate therapy?

A. Molnupiravir for 5 days
B. No treatment indicated
C. Hospitalize her for 5 days of IV remdesivir and dexamethasone
D. Nirmatrelvir-ritonavir (Paxlovid) but instruct her to hold her statin for 7 days
E. Prednisone or dexamethasone

8

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IDBR INFECTIOUS DISEASE BOARD REVIEW 2025

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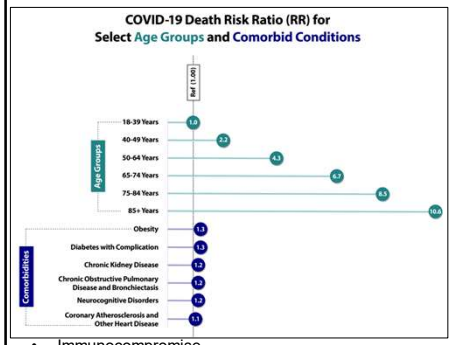
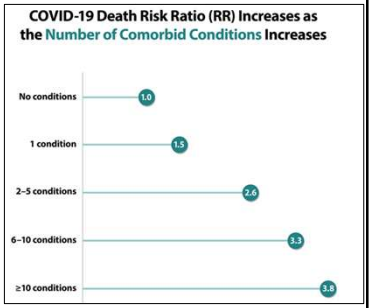
9

Risk Factors for Severe Disease





- Immunocompromise
- Pregnancy
- Social determinants of health

Kompaniyets. Prev Chronic Dis 2021;18:210123

10

Covid-19: Therapeutic Management of Outpatients

Management of Nonhospitalized Patients

Patient Disposition	Panel's Recommendations
All Patients	• Symptom management should be initiated for all patients (AIII). • The Panel recommends against the use of dexamethasone or other systemic corticosteroids (AIIb), unless these agents are being used to treat an underlying condition (AIII).
Patients Who Are at High Risk for Progressing to Severe COVID-19	*Preferred therapies. Listed in order of preference:* • Ritonavir-boosted nirmatrelvir (Paxlovid) (AIIa). Start as soon as possible and within 5 days of symptom onset. See footnote on drug-drug interactions. • Remdesivir (BIIa). Start as soon as possible and within 7 days of symptom onset. *Alternative therapy. For use when the preferred therapies are not available, feasible to use, or clinically appropriate:* • Molnupiravir (CIIa). Start as soon as possible and within 5 days of symptom onset. There is insufficient evidence for the Panel to recommend either for or against initiating these antiviral agents after the timeframes listed above.

Each recommendation in the Guidelines receives a rating for the strength of the recommendation (A, B, or C) and a rating for the evidence that supports it (I, IIa, IIb, or III).

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Antiviral Agents for Sars-CoV-2 Infection

- Paxlovid (nirmatrelvir/ritonavir)
  - Decreased hospitalization or death by 86% in unvaccinated patients with increased risk
  - Considered safe in pregnancy
  - Many DDI's via CYP3A. Many are manageable. https://www.covid19-druginteractions.org/
- IV Remdesivir
  - 3 days effective for high-risk outpatients in PineTree
  - 5 days for hospitalized patients
- Molnupiravir
  - Inhibits viral replication by inducing RNA mutagenesis
  - Less effective than N/R or remdesivir
  - Contraindicated in pregnancy, patients < 18 years
- Convalescent plasma (?)

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Covid-19: Therapeutic Management of Hospitalized Patients-1

Disease Severity	Recommendations for Antiviral or Immunomodulator Therapy		Recommendations for Anticoagulant Therapy
	Clinical Scenario	Recommendation	
Hospitalized for Reasons Other Than COVID-19	Patients with mild to moderate COVID-19 who are at high risk for progressing to severe COVID-19	Recommendations for these patients are the same as those for nonhospitalized adults with COVID-19. See the Management of Nonhospitalized Patients figure.	For patients without an indication for therapeutic anticoagulation: • Prophylactic dose of heparin, unless contraindicated (AI); (BIII) for pregnant patients
Hospitalized but Does Not Require Supplemental Oxygen	All patients	The Panel recommends against the use of dexamethasone (AIIa) or other systemic corticosteroids (AIII) for the treatment of COVID-19.	
	Patients who are at high risk for progressing to severe COVID-19	Remdesivir (BIIb) for patients who are immunocompromised; (BIII) for other high-risk patients.	
Hospitalized and Requires Conventional Oxygen	Patients who require minimal conventional oxygen	Remdesivir (BIIa).	For nonpregnant patients with D-dimer levels above the ULN who do not have an increased bleeding risk: • Therapeutic dose of heparin (CIIa) For other patients: • Prophylactic dose of heparin, unless contraindicated (AI); (BIII) for pregnant patients
	Most patients	Use dexamethasone plus remdesivir (BIIa). If remdesivir cannot be obtained, use dexamethasone (BI).	
	Patients who are receiving dexamethasone and who have rapidly increasing oxygen needs and systemic inflammation	Add 1 of the following immunomodulators: *Preferred* • PO baricitinib (BIIa) • IV tocilizumab (BIIa) *Alternatives (Listed in Alphabetical Order)* • IV abatacept (CIIa) • IV infliximab (CIIa)	

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Covid-19: Therapeutic Management of Hospitalized Patients-2

Disease Severity	Recommendations for Antiviral or Immunomodulator Therapy		Recommendations for Anticoagulant Therapy
	Clinical Scenario	Recommendation	
Hospitalized and Requires HFNC Oxygen or NIV	All patients	Dexamethasone should be administered to all patients (AI). If not already initiated, promptly add 1 of the following immunomodulators: *Preferred* • PO baricitinib (AI) *Preferred Alternative* • IV tocilizumab (BIIa) *Additional Alternatives (Listed in Alphabetical Order)* • IV abatacept (CIIa) • IV infliximab (CIIa) Add remdesivir to 1 of the options above in certain patients.	For patients without an indication for therapeutic anticoagulation: • Prophylactic dose of heparin, unless contraindicated (AI); (BII) for pregnant patients For patients who start on a therapeutic dose of heparin in a non-ICU setting and then transfer to the ICU, the Panel recommends switching to a prophylactic dose of heparin, unless there is another indication for therapeutic anticoagulation (BIII).
Hospitalized and Requires MV or ECMO	All patients	Dexamethasone should be administered to all patients (AI). If the patient has not already received a second immunomodulator, promptly add 1 of the following (listed in alphabetical order): • PO baricitinib (BIIa) • IV tocilizumab (BIIa)	

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Question #2

- 23-year-old man presents with 3 days of fever, abdominal pain, diarrhea; one day of chest pain and shortness of breath
- He and his housemates had cough, fever, sore throat 4 weeks ago. One of them developed anosmia and tested positive for SARS-CoV-2
- On exam he is tachypneic, tachycardic and febrile to 38.4 with mild conjunctivitis, rales at both lung bases and abdominal tenderness
- WBC 10K, ANC 1000; Platelets 140K, CRP 22, transaminases in 90s, Ferritin 1020;
- CXR shows pulmonary edema, no consolidation. EKG non-specific T wave inversion
- Covid antigen negative in ED but PCR positive

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Question #2

What is the most likely to be helpful?

A. Send him to the cath lab for angioplasty and stent
B. Begin cefepime and vancomycin for presumed sepsis
C. Start remdesivir and dexamethasone
D. Start IVIG and Methylprednisolone
E. Obtain chest CT angiogram and start TPA

16

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E. Obtain chest CT angiogram and start TPA

17

CDC Case Definition of MIS-C

- An individual aged <21 years presenting with fever*, laboratory evidence of inflammation**, and evidence of clinically severe illness requiring hospitalization, with multisystem (≥2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); AND
- No alternative plausible diagnoses; AND
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms.

- **Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin

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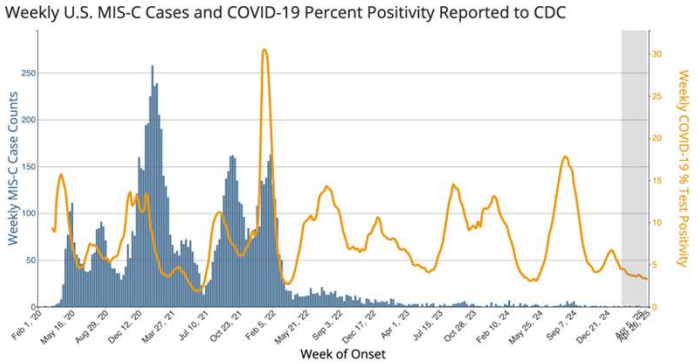
MIS-C Case Peaks Follows Peaks in Covid Cases by about 4 Weeks



https://covid.cdc.gov/covid-data-tracker/#mis-national-surveillance

19

MIS-A vs Acute Covid-19

- MIS-A from 6 academic centers. Matched to pts with acute Covid
- MIS-A more likely to be black
- Less likely to be obese (OR 0.45), have underlying conditions (OR 0.36)
- 87% with cardiac dysfunction, 81%elevated troponin

	MIS-A (N-53)	Covid-19 (N=106)	
Signs and symptoms up to and including the day of hospital admission			
Rash	8 (15)	1 (1)	16.38 (2.82–420.80)[f]
Abdominal pain	16 (30)	4 (4)	10.19 (2.96–35.08)
Altered mental status	4 (8)	1 (1)	7.69 (1.03–213.80)[h]
Conjunctival injection	3 (6)	1 (1)	5.73 (.65–167.21)[h]
Vomiting	21 (40)	13 (12)	3.80 (1.78–8.14)
Chest pain, pressure, or discomfort	19 (36)	21 (20)	2.41 (1.11–5.27)
Diarrhea	29 (55)	36 (34)	2.32 (1.16–4.62)
Headache	9 (17)	10 (9)	1.95 (.74–5.15)
Fever[i]	47 (89)	86 (81)	1.73 (.60–4.94)
Anosmia or ageusia	5 (9)	15 (14)	.61 (.20–1.84)
Dyspnea	33 (62)	92 (87)	.25 (.11–.58)
Cough	19 (36)	91 (86)	.02 (.00–.15)
Neck pain	3 (6)	0 (0)	$P = .04$[g]
Cervical lymphadenopathy	1 (2)	0 (0)	$P = .33$[g]

Melgar CID 2023:77;1395

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Take Homes

- Recognize risk factors for severe Covid-19, including pregnancy
- Recognize windows for antiviral therapy and immunomodulator therapy
- Remember thrombotic complications of Covid
- Prepare for questions about treating moderate and severe disease

  Don't memorize all of the DDI's
- Be alert for MIS-A case
- Myocarditis in an adolescent or young male after mRNA vaccine is a possible question

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