

Today's Agenda

Time (MT)	Presentation	Presenter(s)
Noon – 12:05 pm	Welcome, Announcements, Introductions	Lachelle Smith, Director, ECHO Idaho
12:05 – 12:10 pm	Idaho Epidemiology Curves and Public Health Updates	Carolyn Buxton Bridges, MD FACP
12:10 – 12:15 pm	Update on Medications for COVID-19	Cathy Oliphant, PharmD
12:15 – 12:55 pm	Inpatient and Critical Care COVID-19 Case Conversations and Q&A	Sky Blue, MD Mark McConnell, MD Cathy Oliphant, PharmD Andrea Christopher, MD MPH Megan Dunay, MD MPH
12:55 – 1:00 pm	Closing, Announcements, Call to Action	Megan Dunay, MD MPH Lachelle Smith, Director, ECHO Idaho

COVID-19 Case Conversation: Inpatient and Critical Care

April 14, 2020

Sky Blue, MD

Mark McConnell, MD

Cathy Oliphant, PharmD

Carolyn Buxton Bridges, MD FACP

Andrea Christopher, MD MPH

Megan Dunay, MD MPH

Idaho Epidemiology Curves and Public Health Updates

Carolyn Buxton Bridges, MD, FACP

Governor's Coronavirus Working Group, Former CDC Public Health Physician and Researcher

Cumulative Cases in Idaho, and by County, Age Group and Sex

1,453

Cases
(Lab Confirmed)

33

Fatalities

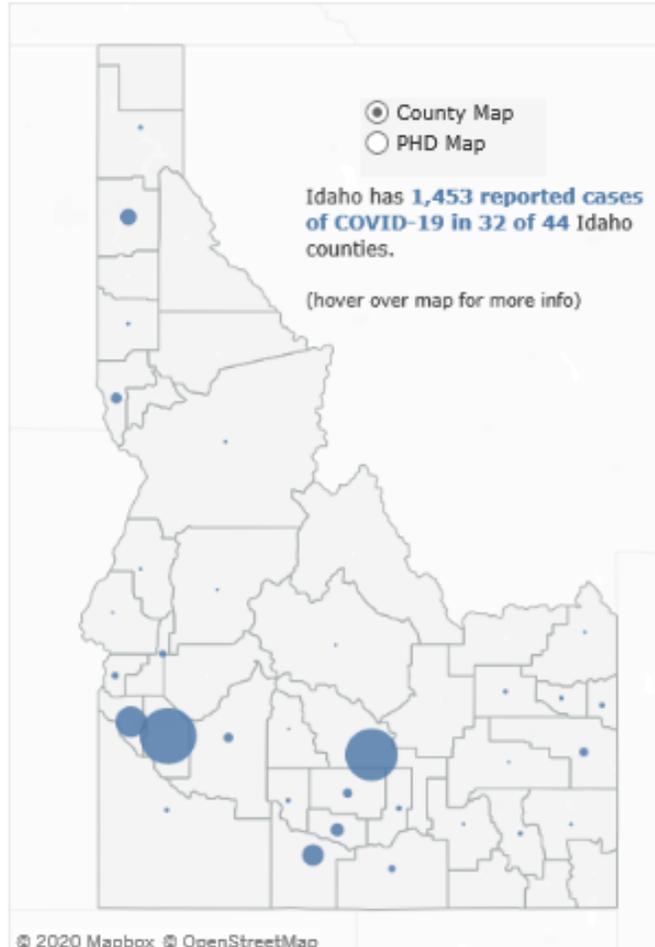
135

Hospitalizations

15,114

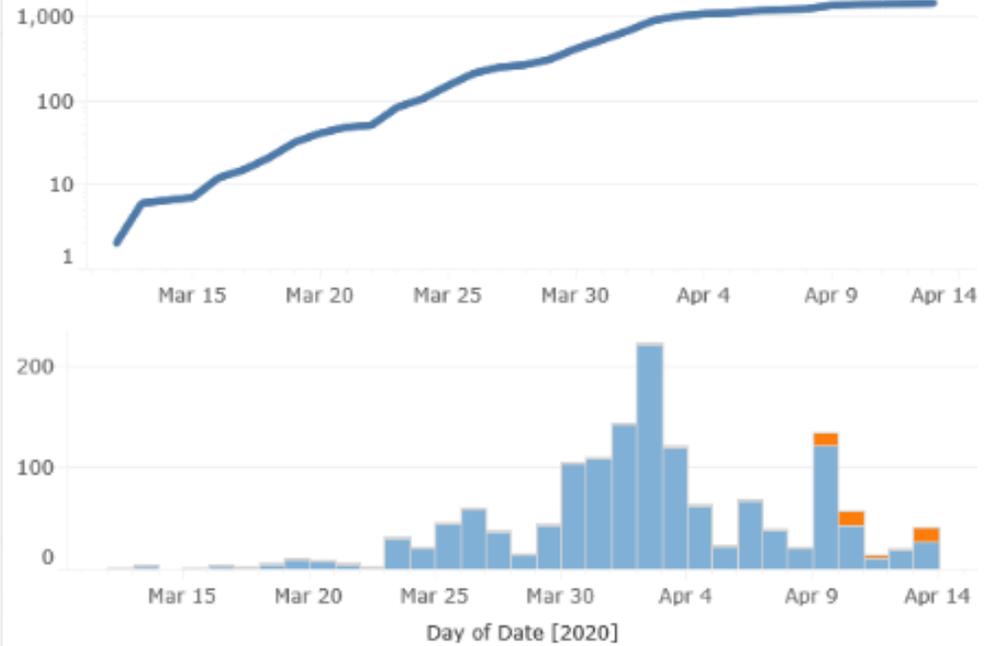
Tested

COVID-19 by County

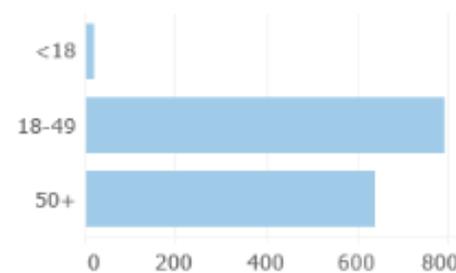


COVID-19 Trend

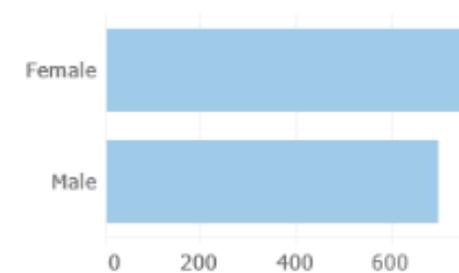
Cumulative Cases and Daily Case Count (below)



COVID-19 by Age Group



COVID-19 by Sex



SARS-CoV-2 PCR Testing in Idaho



- At least 135 (9.3%) hospitalized
- At least (2.6%) ICU, ~ 24% of hospitalized in ICU
- At least 156 (10.7%) healthcare personnel

Cumulative number of people tested through the Idaho Bureau of Laboratories (IBL)*	3/30: 1,567
	4/2: 1,851
	4/6: 2,263
	4/9: 2,571
	4/13: 2,828
Cumulative number of people tested through commercial laboratories**	3/30: 4,145
	4/2: 6,094
	4/6: 8,983
	4/9: 10,523
	4/13: 12,284

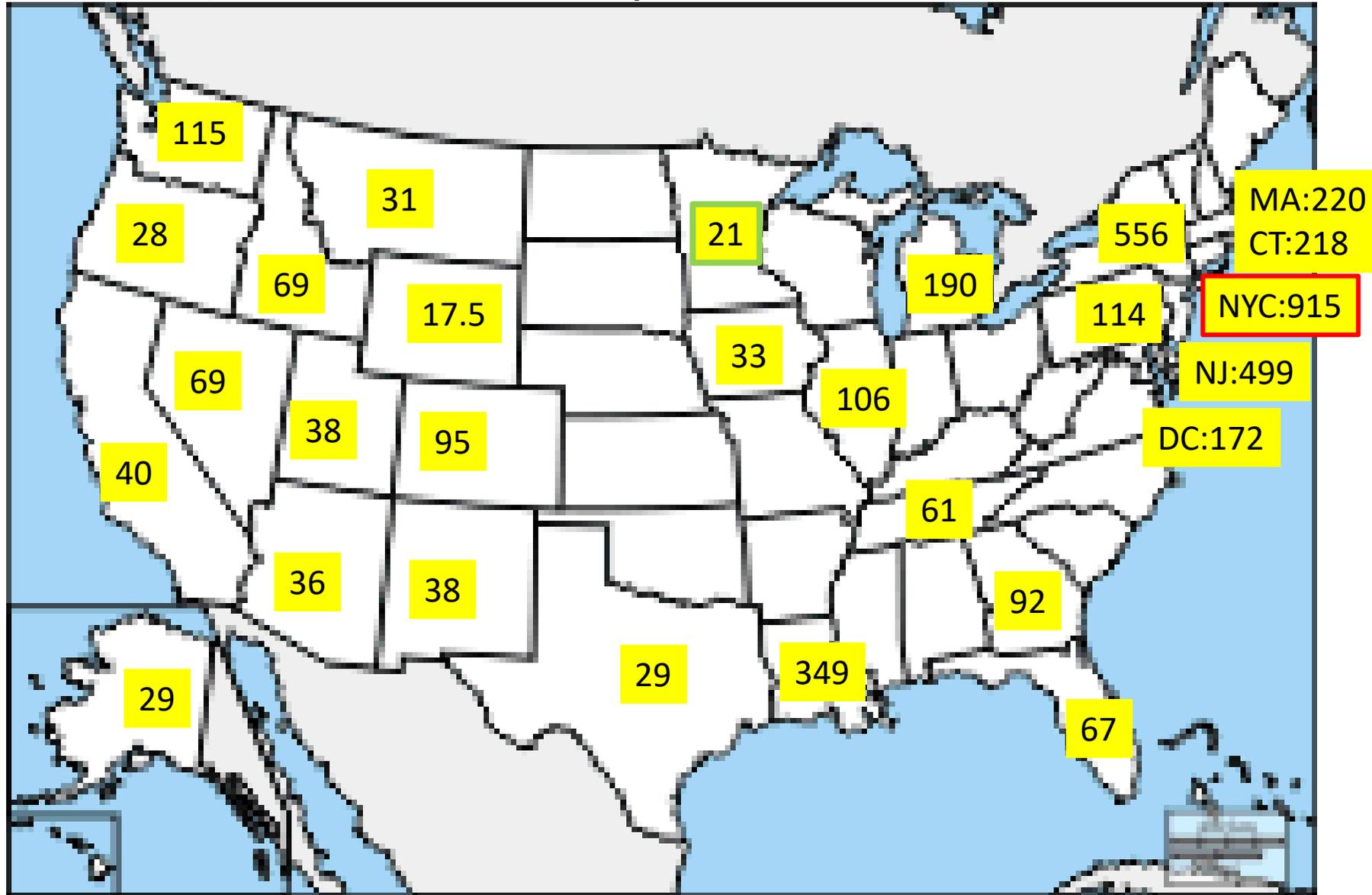
<https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>.

And <https://coronavirus.idaho.gov>.

Update on PPE

- Supplies:
 - Last of the Strategic National Stockpile (SNS) inventory being dispersed this week.
 - PPE will now be procured through state purchase and requests for assistance placed with FEMA.
 - Expect update next week on processes for ordering.
- Recommendations on optimal PPE for healthcare personnel
 - Source control considering asymptomatic spread – all HCP in HC facilities wear masks
 - Standard and transmission-based precautions with suspected or confirmed COVID-19 patient: use a respirator (or facemask if a respirator is not available), gown, gloves, and eye protection.
 - If limited respirators available (N95), facemasks if non-aerosol-generating procedures
 - Aerosol generating procedures – e.g. open suctioning of airways, sputum induction, CPR, intubation, ventilation (e.g., BiPAP, CPAP), bronchoscopy. Maybe nebulizer administration, and high flow O2 delivery.
 - Guidance also includes discussion of options when PPE limited

Geographic Differences in COVID-19 Cases, Deaths, and Incidence, United States, February 12–April 7, 2020 *Early Release* / April 10, 2020



- U.S. ave. incidence of COVID positive cases 119.6 per 100,000
- Case-fatality ratios 0.7% in Utah to 5.7% in Kentucky.
- Doubling time av. 6.5 days



ECHO IDAHO

Update on Medications for COVID-19

Cathy Oliphant, PharmD

Infectious Disease, Professor and Interim Chair, ISU College of Pharmacy

Investigational Therapies for COVID-19

- Hydroxychloroquine (or chloroquine) +/- azithromycin
- Remdesivir
- Lopinavir/ritonavir (Kaletra) +/- interferon-beta +/- ribavirin
- Favipiravir
- Ivermectin
- Convalescent plasma
 - Collected from COVID-19 survivors
- Interleukin-6 Inhibitors
 - Tocilizumab (Actemra)
 - Sarilumab (Kevzara)
 - Cytokine release (IL, TNF α and other inflammatory mediators) causes severe lung damage in serious COVID-19 infections

* Hydroxychloroquine (Plaquenil)/Chloroquine

- Use/Rationale
 - Inhibits pH-dependent steps of viral replication
 - Immune modification – decreases production of cytokines
- Clinical Experience
 - Limited evidence from small, non-randomized studies in China and France
 - Flawed study design
 - Asymptomatic, mild patients enrolled
 - Patients lost F/U
 - Recent study out of Brazil
 - ↑ QTc prolongation with ↑ dose
 - Current clinical trials
 - ORCHID Study (NIH)
 - Post-exposure/Pre-emptive treatment study
 - NCT 04308668
 - <https://clinicaltrials.gov/ct2/show/NCT04308668>
 - Pre-exposure study
 - [Covidpep.umn.edu](https://covidpep.umn.edu)
- Dosage - Treatment
 - Hydroxychloroquine (+/- azithromycin)
 - Better tolerated than chloroquine
 - 400 mg BID day 1 then 200 mg BID days 2-5
 - When to initiate therapy
 - Chloroquine
 - 500 mg BID x 10 days
- Drug Interactions
- Adverse Effects
 - Cardiac toxicity
 - QT prolongation (AE of azithromycin too)
 - Use with caution if baseline QTc > 500
 - Use with caution if hypokalemia, uncontrolled diabetes, known G6PD deficiency, renal impairment, myasthenia gravis
 - GI – N/V/D
 - CNS – headache, dizziness, irritability, nightmares, seizures

Remdesivir

- MOA

- Interference with viral RNA-dependent RNA polymerase that results in premature termination of viral RNA transcription

- Clinical Experience

- Limited in SARS-CoV-2
- Compassionate use data to date
- Compassionate Use of Remdesivir for Patients with Severe Covid-19 in NEJM 4/10/2020 (NEJM.org)

- Dosage

- * Expanded access and clinical trials (moderate to severe COVID-19)
- 200 mg IV day 1 followed by 100 mg IV daily on days 2-5 or days 2-10 (depending on trial)

<https://www.ashp.org/Pharmacy-Practice/Resource-Centers/Coronavirus>; <https://www.cdc.gov/coronavirus/2019>;
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>; <https://www.sccm.org/SurvivingSepsisCampaign/Guidelines/COVID-19>;

www.sidp



ECHO IDAHO

Remdesivir Adverse Effects

- Data demonstrates adverse effect incidence of 50-70% (grade 1 -2) in patients receiving 5 – 14 days of therapy
- GI
 - Nausea
 - Dyspepsia
 - Constipation
- Headache
- Extremity pain
- ALT/AST increase
 - Onset 5 – 25 days; resolution 3 – 47 days
- Phlebitis

Compassionate Use of Remdesivir for Patients with Severe Covid-19

Figure S1. Patient Disposition

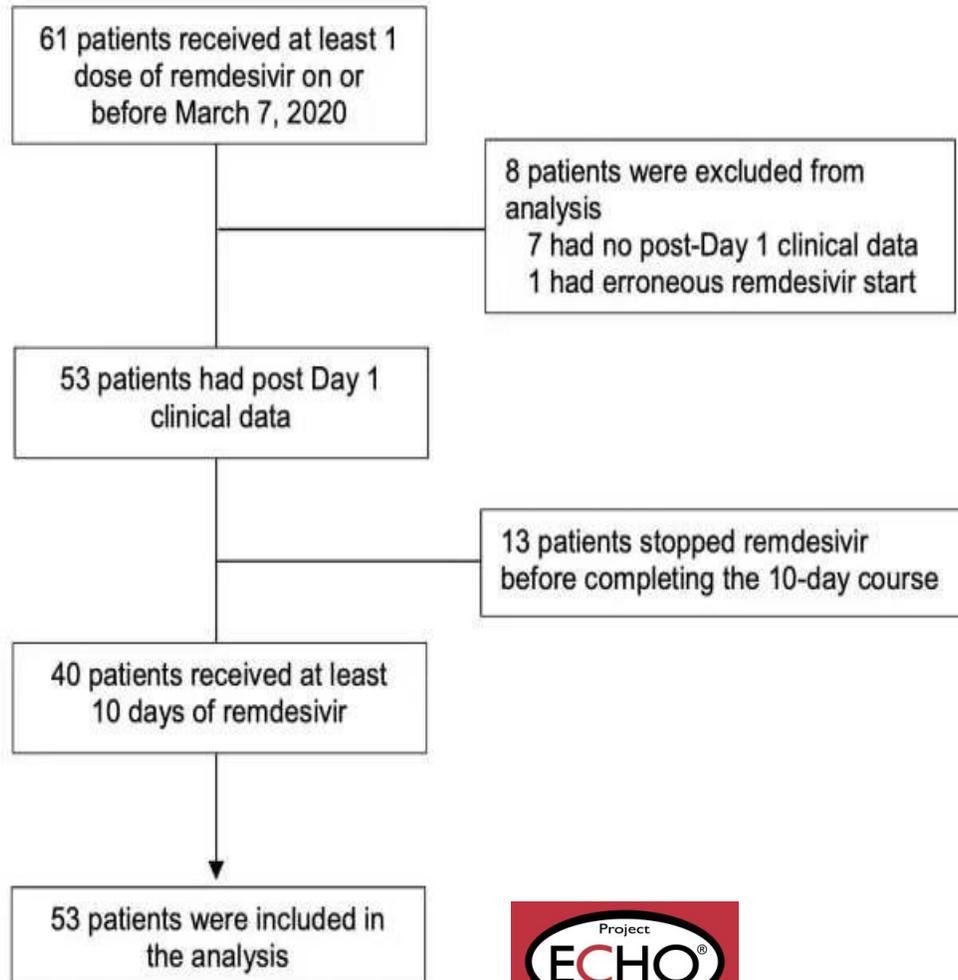


Table 1. Baseline Demographic and Clinical Characteristics of the Patients.*

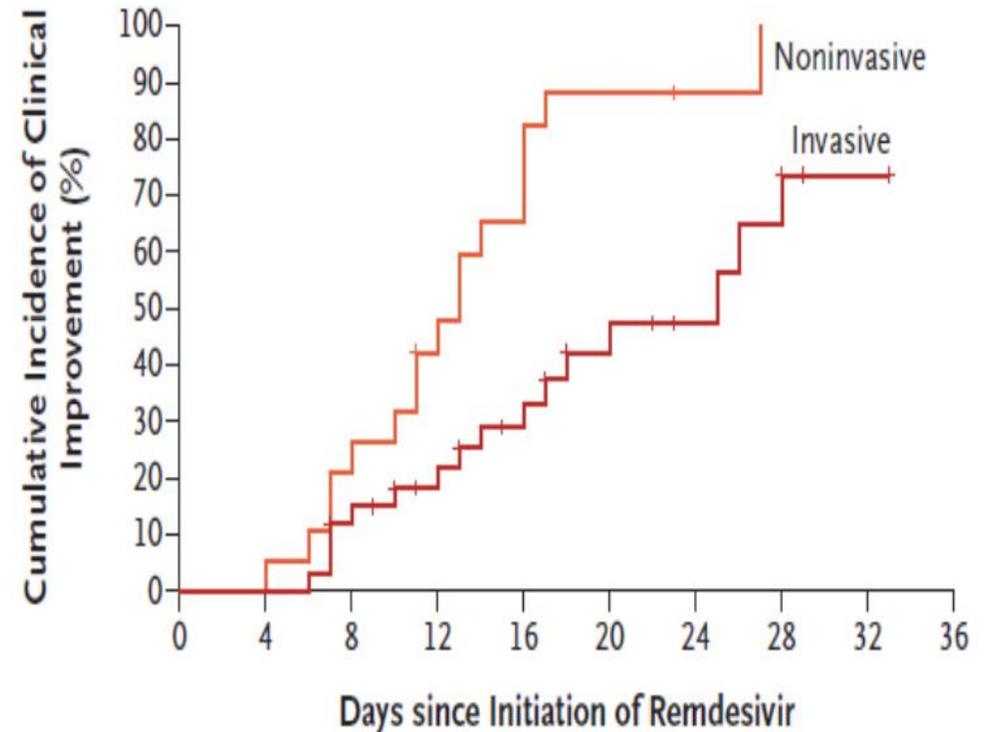
Characteristic	Invasive Ventilation (N=34)	Noninvasive Oxygen Support (N=19)	Total (N=53)
Median age (IQR) — yr	67 (56–72)	53 (41–68)	64 (48–71)
Age category — no. (%)			
<50 yr	6 (18)	8 (42)	14 (26)
50 to <70 yr	14 (41)	7 (37)	21 (40)
≥70 yr	14 (41)	4 (21)	18 (34)
Male sex — no. (%)	27 (79)	13 (68)	40 (75)
Region — no. (%)			
United States	14 (41)	8 (42)	22 (42)
Japan	8 (24)	1 (5)	9 (17)
Europe or Canada	12 (35)	10 (53)	22 (42)
Oxygen-support category — no. (%)			
Invasive ventilation	34 (100)	—	34 (64)
Invasive mechanical ventilation	30 (88)	—	30 (57)
Extracorporeal membrane oxygenation	4 (12)	—	4 (8)
Noninvasive oxygen support	—	19 (100)	19 (36)
Noninvasive positive-pressure ventilation	—	2 (11)	2 (4)
High-flow oxygen	—	5 (26)	5 (9)
Low-flow oxygen	—	10 (53)	10 (19)
Ambient air	—	2 (11)	2 (4)
Median duration of symptoms before remdesivir therapy (IQR) — days	11 (8–15)	13 (10–14)	12 (9–15)
Coexisting conditions — no. (%)			
Any condition	25 (74)	11 (58)	36 (68)
Hypertension	9 (26)	4 (21)	13 (25)
Diabetes	8 (24)	1 (5)	9 (17)
Hyperlipidemia	6 (18)	0	6 (11)
Asthma	5 (15)	1 (5)	6 (11)
Median laboratory values (IQR)			
ALT — IU per liter	48 (31–79)	27 (20–45)	37 (25–61)
AST — IU per liter	39 (30–76)	35 (28–46)	36 (29–67)
Creatinine — mg per deciliter	0.90 (0.66–1.17)	0.79 (0.63–1.00)	0.89 (0.64–1.08)

		No. of Patients in Oxygen-Support Group at Baseline (%)			
		Invasive (N=34)	Noninvasive (N=7)	Low-flow oxygen (N=10)	Ambient air (N=2)
Category on ordinal scale →		5	4	3	2
Death	6	6 (18)	1 (14)	0	0
Invasive	5	9 (26)	1 (14)	0	0
Noninvasive	4	3 (9)	0	0	0
Low-flow oxygen	3	0	0	0	0
Ambient air	2	8 (24)	0	0	0
Discharged	1	8 (24)	5 (71)	10 (100)	2 (100)
Improvement		19 (56)	5 (71)	10 (100)	2 (100)
	↑				
	Category on ordinal scale				

Figure 1. Oxygen-Support Status at Baseline and after Treatment.

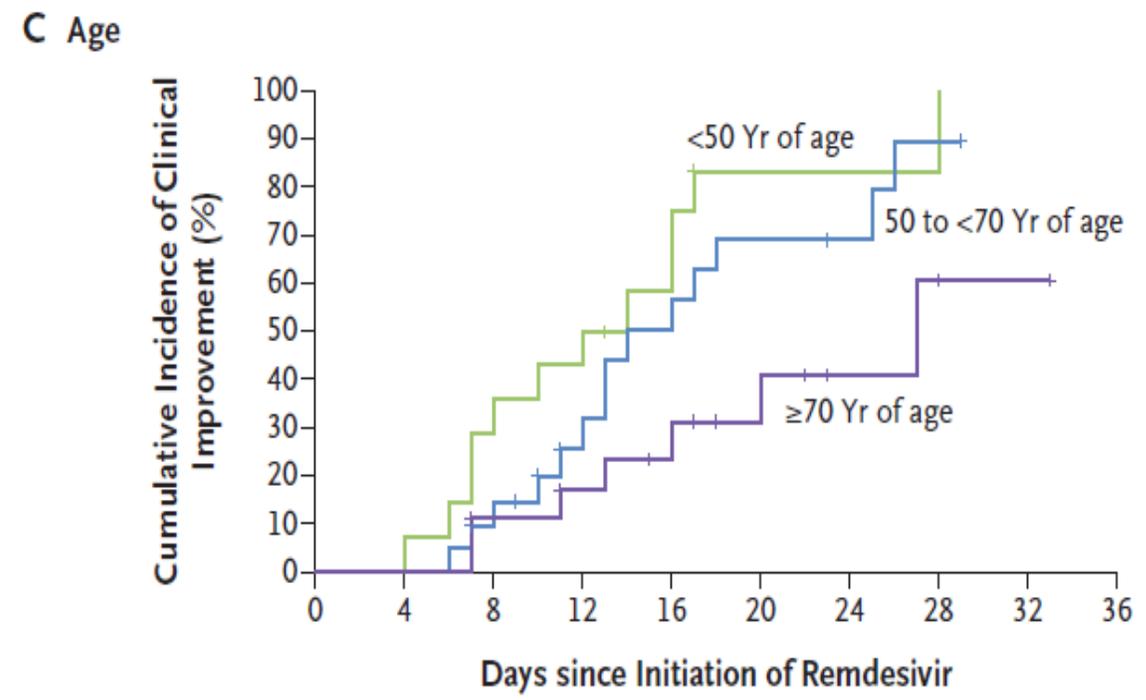
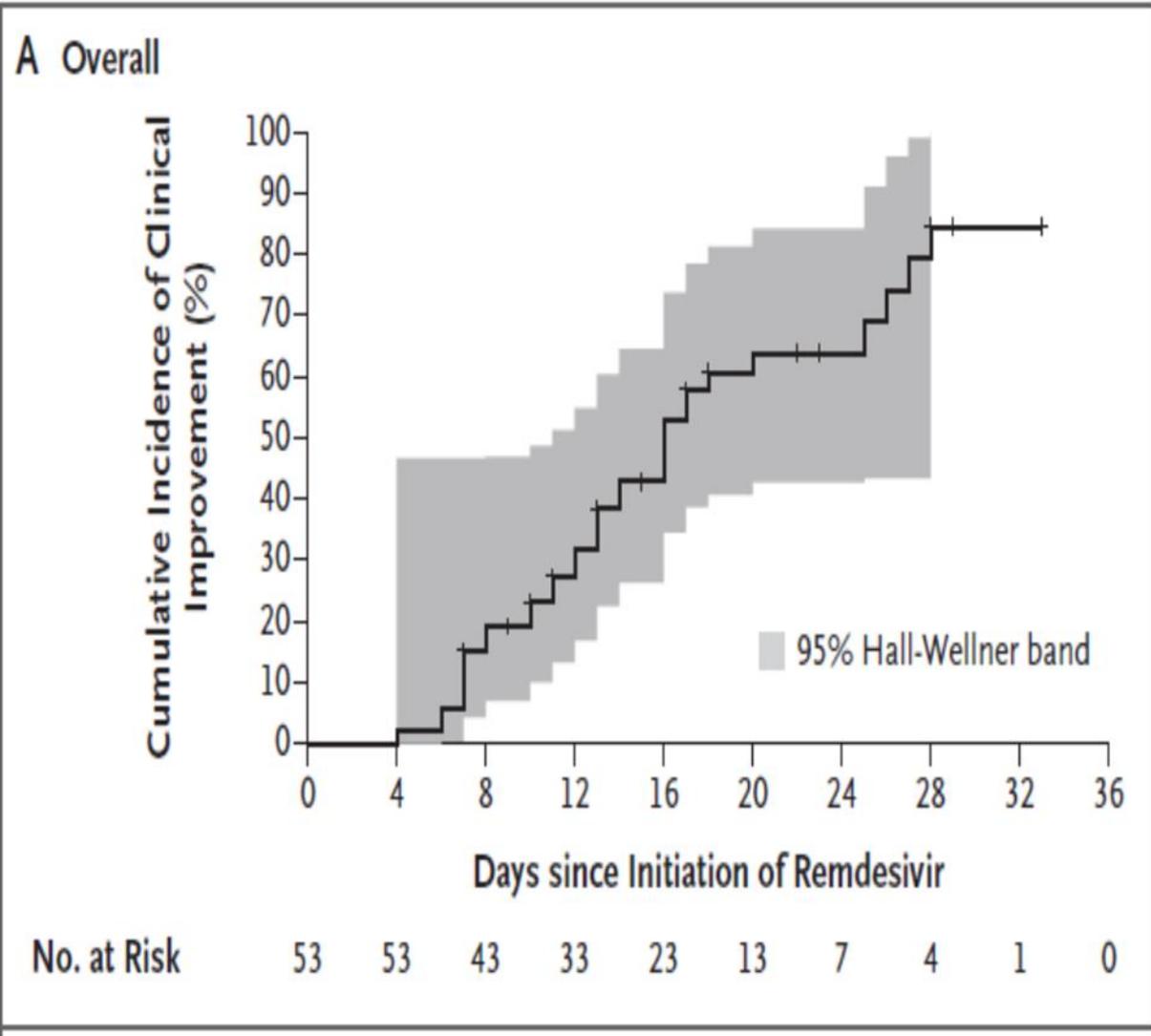
For each oxygen-support category, percentages were calculated with the number of patients at baseline as the denominator. Improvement (blue cells), no change (beige) and worsening (gray) in oxygen-support status are shown. Invasive ventilation includes invasive mechanical ventilation, extracorporeal membrane oxygenation (ECMO), or both. Noninvasive ventilation includes nasal high-flow oxygen therapy, noninvasive positive pressure ventilation (NIPPV), or both.

B Baseline Oxygen Support



No. at Risk

Noninvasive	19	19	15	10	6	2	1	0		
Invasive	34	34	28	23	17	11	6	4	1	0



No. at Risk

<50 Yr of age	14	14	10	8	5	1	1	1		
50 to <70 Yr of age	21	21	18	12	8	5	3	1	0	
≥70 Yr of age	18	18	15	13	10	7	3	2	1	0

Table 2. Summary of Adverse Events.

Event	Invasive Ventilation (N=34)	Noninvasive Oxygen Support (N=19)	Total (N=53)
	<i>number of patients (percent)</i>		
Any adverse event	22 (65)	10 (53)	32 (60)
Adverse events occurring in 2 or more patients			
Hepatic enzyme increased*	8 (24)	4 (21)	12 (23)
Diarrhea	1 (3)	4 (21)	5 (9)
Rash	3 (9)	1 (5)	4 (8)
Renal impairment	4 (12)	0	4 (8)
Hypotension	3 (9)	1 (5)	4 (8)
Acute kidney injury	2 (6)	1 (5)	3 (6)
Atrial fibrillation	2 (6)	1 (5)	3 (6)
Multiple-organ-dysfunction syndrome	3 (9)	0	3 (6)
Hypernatremia	3 (9)	0	3 (6)
Deep-vein thrombosis	3 (9)	0	3 (6)
Acute respiratory distress syndrome	1 (3)	1 (5)	2 (4)
Pneumothorax	2 (6)	0	2 (4)
Hematuria	2 (6)	0	2 (4)
Delirium	1 (3)	1 (5)	2 (4)
Septic shock	2 (6)	0	2 (4)
Pyrexia	1 (3)	1 (5)	2 (4)
Any serious adverse event	9 (26)	3 (16)	12 (23)
Serious events occurring in 2 or more patients			
Multiple-organ-dysfunction syndrome	2 (6)	0	2 (4)
Septic shock	2 (6)	0	2 (4)
Acute kidney injury	2 (6)	0	2 (4)
Hypotension	2 (6)	0	2 (4)

* Adverse-event terms are based on the *Medical Dictionary for Regulatory Activities*, version 22.1. Hepatic enzyme increased includes the following terms: hepatic enzyme increased, alanine aminotransferase increased, aspartate aminotransferase increased, and transaminases increased. Elevated hepatic enzymes resulted in discontinuation of remdesivir therapy in 2 patients.



Clinical Trials/Websites

- Remdesivir
 - <https://rdvcu.gilead.com/>
- ClinicalTrials.gov
 - <https://clinicaltrials.gov/ct2/results?cond=COVID-19>
- ORCHID Trial
 - <https://clinicaltrials.gov/ct2/show/NCT04332991>
- SOLIDARITY Trial
 - <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/solidarity-clinical-trial-for-covid-19-treatments>

Questions From the Field

Sky Blue, MD, Infectious Disease Medicine

Mark McConnell, MD, Pediatrics, Internal Medicine, Pediatric Critical Care, and Adult Critical Care Medicine

Cathy Oliphant, PharmD, Infectious Disease, Professor & Interim Chair, ISU College of Pharmacy

Andrea Christopher, MD MPH, Internist, Boise VA; Associate Program Director for UW Boise Internal Medicine Residency

Megan Dunay, MD MPH, Geriatrician, Boise VA and Medical Director for Geriatrics and Extended Care for VA Pacific Northwest Region

How are you incorporating testing availability into clinical decision making?

What is ideal PPE?
How are you/your hospital
managing a limited supply?

Do we know what "mild"
COVID-19 looks like?

What's the status of
Hydroxychloroquine and
Azithromycin?
Data on efficacy of treatment
and availability in Idaho?

Concerns around cardiotoxicity of chloroquine and hydroxychloroquine are (finally) hitting the main stream media. Dr Blue last week described cardiac effects of the virus.

- A) Are there systems in place for clinicians to track and document outcomes of hydroxychloroquine therapy so we know where the cardiac effects are coming from?
- B) Are clinicians starting to limit the use of hydroxychloroquine?

Are patients who are d dimer+
being anti coagulated
routinely due to the multi
organ arteriolar thrombi noted
at autopsy?

Would you suspect that patients with a history of altitude sickness severe enough to need acetazolamide and a ca-channel blocker to prevent symptoms if sleeping above 8500ft, yet without florid high altitude pulmonary edema episodes, therefore be at higher risk for covid-19. Would similar prophylactic Rx potentially help these patients especially if they are otherwise without comorbidities but at risk by age alone for example?

What is the most current data about breastfeeding?

Best practice for milk supply is latching babe or pumping – is this still the case if mom is COVID-19 positive? Would it be good practice to mask mom and wash hands frequently and still breastfeed? Should mom also continue to mask with breastfeeding at home?

Do we know if breastmilk produces antibodies for COVID-19?

My Palliative COVID patients are usually on Morphine drips (1-3 mg/hr) and nonrebreather masks at 15 lpm. They still appear very dyspnic. Should we take the NRB off and just increase the morphine to treat the dyspnea?

Are there any
recommendations for memory
care quarantine?

In Assisted Living settings, if all new admissions are to be treated as positive and we use PPE for the 14 days of quarantine how can we get more supplies we will burn through them very quickly?

More to come...

Friday, April 17 – answering COVID-19 questions, especially those related to **Outpatient/ED. Submit your Questions**

<https://www.uidaho.edu/academics/wwami/echo/covid-19/clinical-question-form>

ECHO Idaho Behavioral Health in Primary Care

- noon-1pm MT Weds, April 15– De-escalation in the Time of COVID-19 presented by Abbey Abbondandolo, Head of Security, St. Luke's