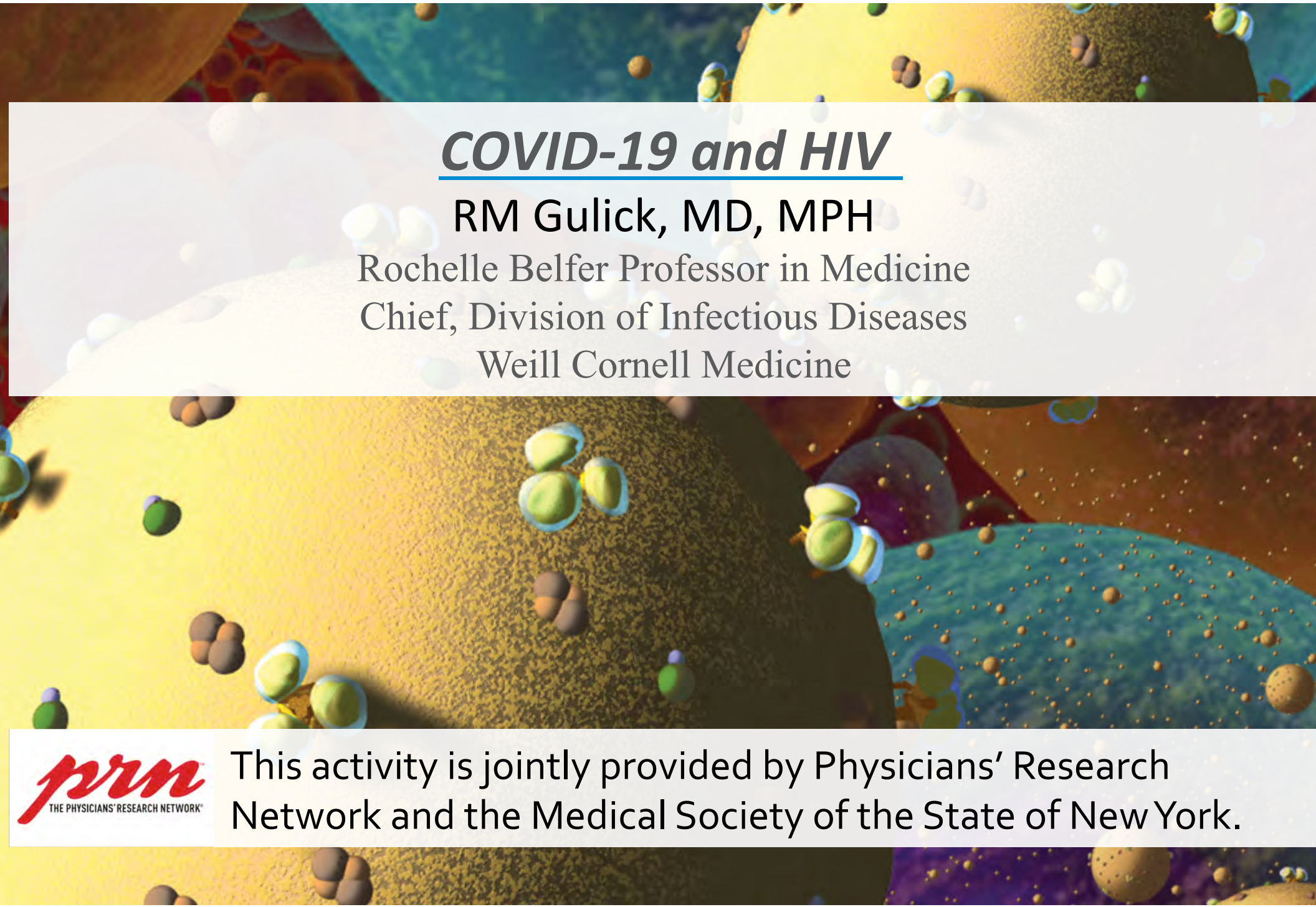


COVID-19 and HIV

RM Gulick, MD, MPH
Rochelle Belfer Professor in Medicine
Chief, Division of Infectious Diseases
Weill Cornell Medicine

This activity is jointly provided by Physicians' Research Network and the Medical Society of the State of New York.

Disclosure Information

none

SCIENCE

CONTENTS

THE LESSONS OF THE PANDEMIC

THE pandemic which has just swept round the earth has been without precedent. There have been more deadly epidemics, but they have been more circumscribed; there have been epidemics almost as widespread, but they have been less deadly. Floods, famines, earthquakes and volcanic eruptions have all written their stories in terms of human destruction almost too terrible for comprehension, yet never before has there been a catastrophe at once so sudden, so devastating and so universal.

The most astonishing thing about th

Epidemiology / Clinical Presentation

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Clinical Characteristics of Coronavirus Disease 2019 in China

1099 laboratory confirmed cases from 552 hospitals in 30 provinces

Median age 47 (IQR:35-58), male (58.1%)

Most common symptoms: fever, cough, fatigue, diarrhea rare (3.8%)

16% severe disease: older age and co-morbidities (24%)

- HTN 15%, DM 7%, CAD 2%, HBV 2%
  cerebrovascular 1.4%,
  cancer 0.9%, renal 0.7%,
  immunodeficiency 0.2%

Clinical Course: 6% mechanical ventilation, 0.5% ECMO, 3.4% ARDS, 1.4% mortality

Limitation: 1029 were still hospitalized at time of analysis

Guan et al, NEJM 2020;382:1708-1720

ER TO THE EDITOR

JOURNAL OF MEDICAL VIROLOGY WILE

infection of SARS-CoV-2 and HIV in a patient in Wuhan , China

Zhu, Cao, Xu, Zhou. J Med Virol 2020;92:529-530

se Report:

yo man

Heavy smoker, type 2 diabetes

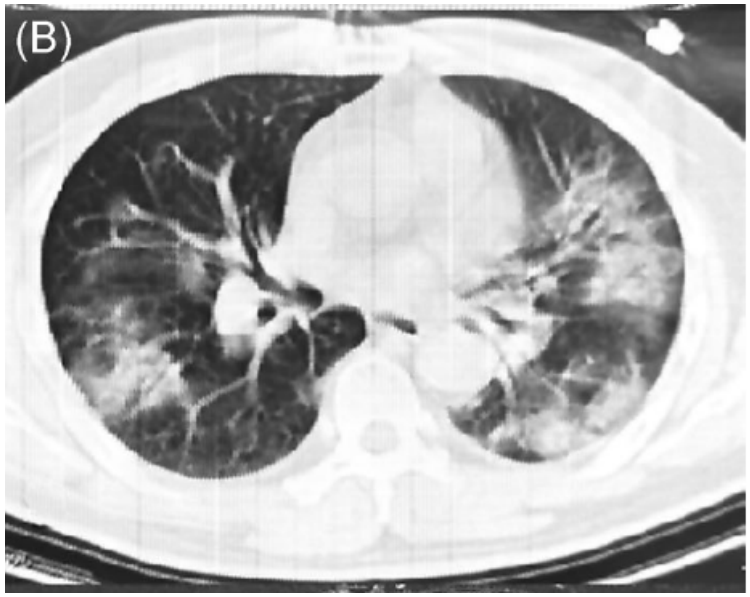
Presented with fever, cough

Chest CT with pneumonia, PCR+ SARS-CoV-2

New HIV antigen/antibody +, CD4% 4.75%

Started on LPV/RTV, γ-globulin and steroids

mproved and discharged



munocompromised patients, such as HIV infections….vulnerable group."

VID-19 in patients th HIV: clinical case ries

THE LANCE
HIV

Blanco, et al. Lancet HIV 2020;7:e314-e316

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
aphics and baseline HIV status					
rs)	40	49	29	40	31
	Transgender	Male	Male	Male	Transgender
us					
f HIV diagnosis	2007	2003	2013	2003	2020
D4 cell count (cells per	616	445	604	1140	13
D4:CD8 ratio	0·8	0·46	1·1	1·2	0·1
al load at or before sion (copies per mL)	<50	<50	<50	<50	45 500
men before admission	Tenofovir alafenamide, emtricitabine, and darunavir-boosted cobicistat	Abacavir, lamivudine, and dolutegravir	Tenofovir alafenamide, emtricitabine, and darunavir-boosted cobicistat	Abacavir, lamivudine; and dolutegravir	No ART: current diagnosi is late presenter
ent and outcomes					
	ART at admission maintained	Tenofovir disoproxil fumarate, and emtricitabine plus lopinavir-boosted ritonavir (on going)	Tenofovir disoproxil fumarate, and emtricitabine plus lopinavir-boosted ritonavir (for 3 days)	Tenofovir disoproxil fumarate, and emtricitabine plus lopinavir-boosted ritonavir (for 14 days)	Tenofovir alafenamide, emtricitabine, and daruna boosted cobicistat (on go
tiviral treatments	No	Interferon beta-1b (for 7 days), hydroxychloroquine (for 7 days)	Hydroxychloroquine (for 5 days)	Hydroxychloroquine (for 5 days)	Interferon beta-1b (for 4 days), hydroxychloroquine (for 5 days)
s	Cured	Still at hospital	Cured	Cured	Cured

ription of COVID-19 in HIV-infected individuals: gle-centre, prospective cohort

a, María J Pérez-Elías, Carmen Quereda, Ana Moreno, María J Vivancos, Fernando Dronda, José L Casado, on behalf of the D Team*

THE LANC
HIV
Lancet HIV 2020 (epub 5/28/20

	HIV-infected individuals with COVID-19 (n=51)	HIV-infected individuals without COVID-19 (n=1288)	p value
ass index, kg/m²	25·5 (22·1–28·0)	23·7 (21·5–26·0)	0·021
	2 (4%)	32 (2%)	0·715
24·9	22 (43%)	518 (40%)	0·019
	27 (53%)	311 (24%)	0·024
ce HIV infection s, years	19·5 (9·3–28·6)	22·6 (13·5–28·7)	0·186
4 count, cells per µL	224 (120–437)	212 (91–330)	0·182
	24 (47%)	597 (46%)	1·000
99	21 (41%)	610 (47%)	0·396
	6 (12%)	81 (6%)	0·138
oviral therapy			
	51 (100%)	1284 (>99%)	1·000
se inhibitors	11 (22%)	175 (14%)	0·578
	8 (16%)	269 (21%)	0·054
	41 (80%)	707 (55%)	0·410
ovir (TAF or TDF)	37 (73%)	487 (38%)	0·0036
idities			
	32 (63%)	495 (38%)	0·00059
tension	18 (35%)	102 (8%)	<0·0001
es	7 (14%)	38 (3%)	0·0011
ic kidney disease	6 (12%)	17 (1%)	0·00014
ic liver disease	24 (47%)	419 (33%)	0·034

- Clinical/lab/radiologic presentation similar to that o general population
- 6 (12%) were critically ill, including 2 with CD4 <200
- 2 (4%) died
- Conclusions
  - HIV is not protective of SARS-CoV-2 infection o severe disease
  - Treat the same as the ge population

OVID-19 and HIV: NYC

Original Investigation

enting Characteristics, Comorbidities, and Outcomes Among 5700 nts Hospitalized With COVID-19 in the New York City Area

ardson, MD, MPH; Jamie S. Hirsch, MD, MA, MSB; Mangala Narasimhan, DO; Crawford, MD, PhD; Thomas McGinn, MD, MPH; Karina W. Davidson, PhD, MASc; orthwell COVID-19 Research Consortium

MA 2020 Apr 22;323:2052-9

Comorbidities	
Total No.	5700
Cancer	320 (6)
Cardiovascular disease	
Hypertension	3026 (56.6)
Coronary artery disease	595 (11.1)
Congestive heart failure	371 (6.9)
Chronic respiratory disease	
Asthma	479 (9)
Chronic obstructive pulmonary disease	287 (5.4)
Obstructive sleep apnea	154 (2.9)
Immunosuppression	
HIV	43 (0.8)
History of solid organ transplant	55 (1)
Kidney disease	
Chronic[c]	268 (5)
End-stage[d]	186 (3.5)
Liver disease	
Cirrhosis	19 (0.4)
Chronic	
Hepatitis B	8 (0.1)
Hepatitis C	3 (0.1)
Metabolic disease	
Obesity (BMI ≥30)	1737 (41.7)
No.	4170
Morbid obesity (BMI ≥35)	791 (19.0)
No.	4170
Diabetes[e]	1808 (33.8)

YU: Karmen-Touhy, et al.

https://www.medrxiv.org/content/10.1101/2020.05.07.20094797v1

	HIV-positive N=21	Non-HIV N=42	P-value
Length of Hospital stay, days	6 (4-13) N=21	5 (3-10) N=42	0.262
O2 Flow rate AVG, L/min	4.5 (2-16) N=16	3.3 (2-12) N=33	0.653
O2 Flow rate MAX, L/min	11 (2-38) N=16	4 (3-15) N=33	0.681
Fraction of inspired oxygen AVG	79.1 ± 21.4 N=7	71.88 ± 34.4 N=12	0.313
Fraction of inspired oxygen MAX	90.0 ± 17.32 N=7	81.25 ± 35.94 N=12	0.278
Expired or transferred to hospice	6 (28.6%)	10 (23.8%)	0.682
Needed ICU	6 (28.6%)	7 (16.7%)	0.271
Needed Invasive Ventilation	5 (23.8%)	5 (11.9%)	0.223
Lactate Dehydrogenase Peak, U/L	477.04 ± 210.37 N=21	436.30 ± 223.02 N=37	0.249
C-Reactive Protein Peak, mg/L	185.13 ± 107.35 N=20	128.06 ± 99.29 N=38	**0.024**
Ferritin Peak, ng/mL	1446 (493-2209) N=20	1156 (314-2148) N=36	0.617
Procalcitonin Peak, ng/mL	0.22 (0.11-0.42) N=20	0.11 (0.06-0.28) N=35	0.227
White blood cell count Peak, 10^3/ul	8.3 (7.1-12.4) N=21	7.3 (5.5-11.6) N=41	0.125
White blood cell count Low, 10^3/ul	5.1 (4.3-5.6) N=21	4.6 (3.6-6.1) N=41	0.828
D-dimer, ng/mL	N=19	N=34	0.315
<1000	11 (57.9%)	26 (76.5%)	
1000-6000	5 (26.3%)	6 (17.6%)	
>6000	3 (15.8%)	2 (5.9%)	
Abnormal initial chest x-ray*	19 (90.5%)	27 (64.3%)	**0.027**
Bilateral	18 (94.7%)	23 (85.2%)	
Unilateral	1 (5.3%)	4 (14.8%)	
Chest x-ray bilateral ever*	18 (85.7%)	29 (69.0%)	0.152
Myocardial Infarction	1 (4.8%)	1 (2.4%)	0.611
Pulmonary Embolism	1 (4.8%)	1 (2.4%)	0.611
Deep Vein Thrombosis	1 (4.8%)	1 (2.4%)	0.611

- Retrospective match cohort study
- Conclusion:
  - HIV coinfection does not significantly imp presentation, hos course, or outcon of patients infect with SARS-CoV when compared matched non-HI patients.

IV and COVID-19: New York City area

wark: 27 HIV+ pts	Okoh, et al. JAIDS 2020;85:e4-e5 (epub 5/28/2
coln: 9 HIV+ pts.	Suwanwongse, et al. J Med Virol (epub 5/28/20
umbia: 31 HIV+ pts	Shalev, et al. Clin Infect Dis (epub 5/30/20)
Sinai: 88 HIV+ pts	Sigel, et al. Clin Infect Dis (epub 6/28/20)
Sinai: 72 HIV+ pts	Ho, et al. J Infect Dis (epub 6/30/20)
stein: 100 HIV+ pts	Patel, et al. IAS 2020 LB abstract OABLB0102
nell: 30 HIV+ pts	Stoeckle et al. OFID (in press)

<u>ll conclusion</u>: No increased risk for infection or complications of COV
ple with HIV (mostly with suppressed VL and adequate CD4 cell count

eterans Administration Cohort Study (VACS

Open cohort of all veterans with HIV and matched 1:2 for age, race/ethnicity, site with veterans without HIV

	PLWH		HIV-uninfected			
	N	%	N	%	**OR/HR**	95% CI
Alive in 2020	30,948		76,618			
Tested for COVID-19	1486	4.8%	2735	3.6%	**1.39**	(1.30, 1.49)
COVID-19 +	189	0.6%	380	0.5%	**1.39**	(1.16, 1.66)
Outcomes						
ICU admission	32	16.0%	72	18.9%	**0.94**	(0.51, 1.73)
intubation	15	7.9%	35	9.2%	**0.99**	(0.65, 1.49)
death	18	9.5%	47	12.4%	**0.96**	(0.56, 1.67)

Conclusions: PLWH higher rate of testing, but no differences in documented infection or complication rates vs. uninfected

Park IAS 2020 #LBPEC23

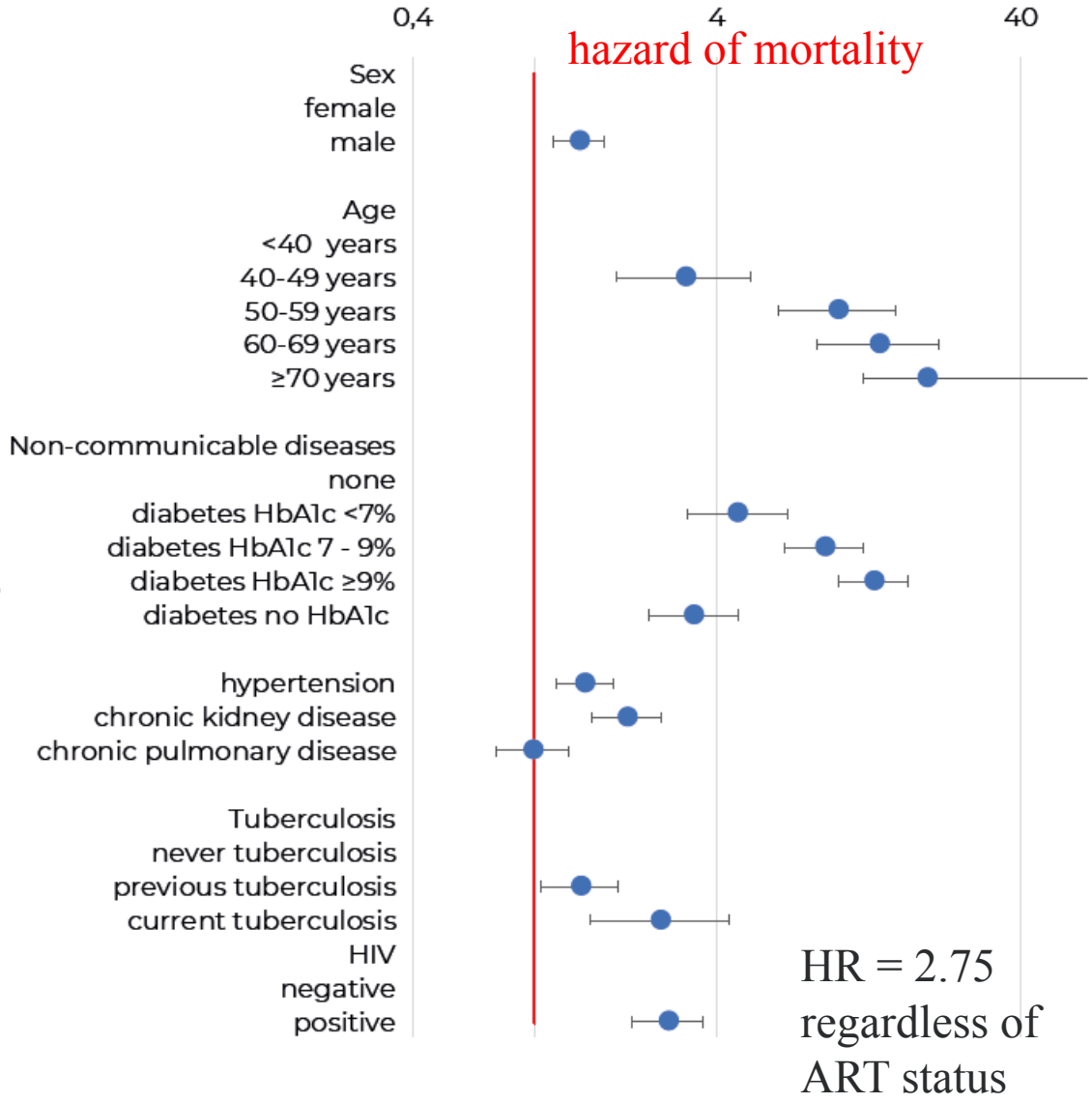
OVID-19 and HIV: South Africa Western Cape

– June 2020

5 million total adult patients

K people living with HIV
- 55% virologically suppressed on ART
- 28% not confirmed suppressed on ART
- 17% never on ART

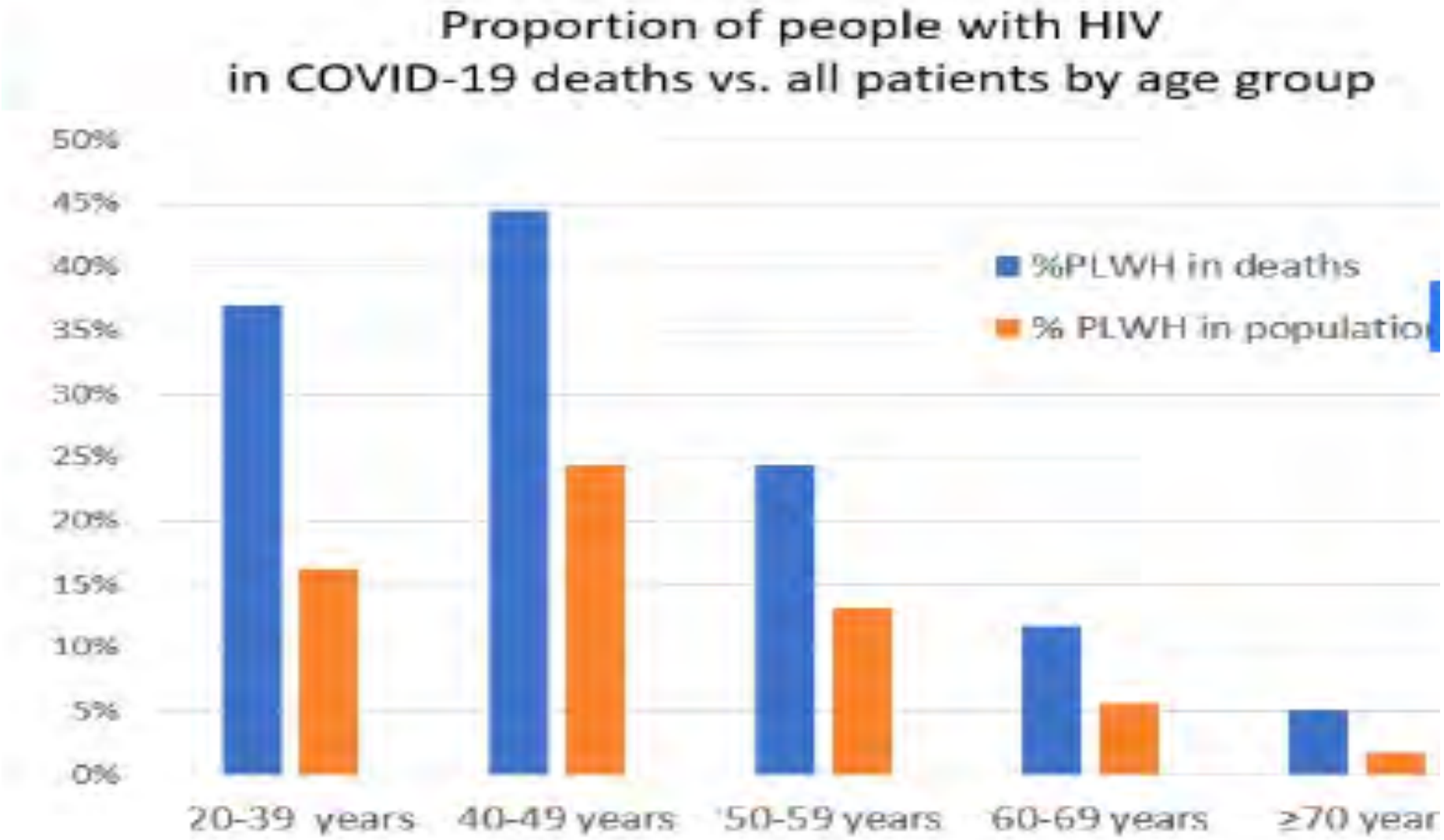
22 COVID-19 cases and 435 deaths



HR = 2.75 regardless of ART status

COVID-19 Special Public Health Surveillance Bulletin, Volume 18, supplement 2 6/22/20

COVID-19 and HIV: South Africa Western Cape



Davies IAS 2020 #OAXLB01

S. CDC

ple of any age with the following conditions **<u>are at increased risk</u>** of severe
ss from COVID-19:

- Chronic kidney disease
- COPD (chronic obstructive pulmonary disease)
- mmunocompromised state (weakened immune system) from solid organ ransplant
- Obesity (body mass index [BMI] of 30 or higher)
- Serious heart conditions, such as heart failure, coronary artery disease, or ardiomyopathies
- Sickle cell disease
- ype 2 diabetes mellitus

www.cdc.gov 6/25/20

.S. CDC

e with the following conditions **might be at an increased risk** for severe illness from COV

thma (moderate-to-severe)

rebrovascular disease (affects blood vessels and blood supply to the brain)

stic fibrosis

pertension or high blood pressure

munocompromised state (weakened immune system) from blood or bone marrow transpla

mune deficiencies, HIV, use of corticosteroids, or use of other immune weakening medicin

urologic conditions, such as dementia

er disease

egnancy

lmonary fibrosis (having damaged or scarred lung tissues)

noking

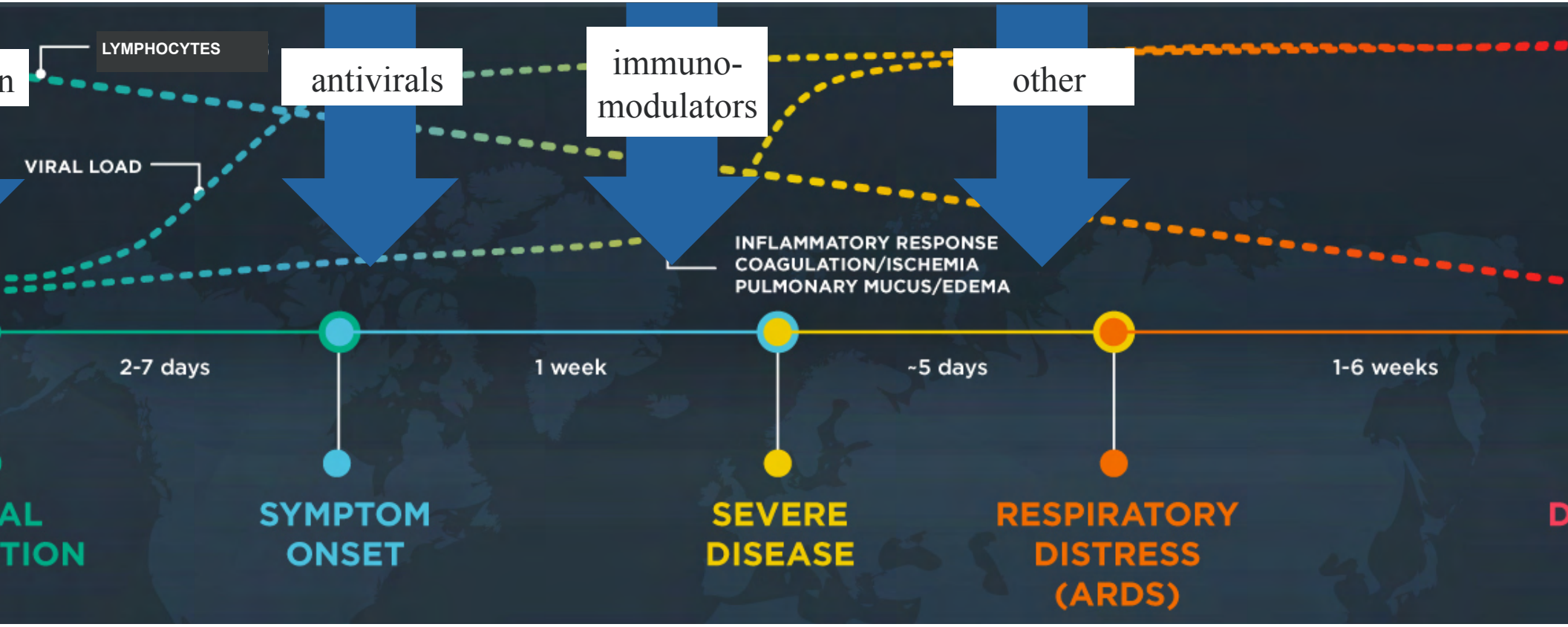
alassemia (a type of blood disorder)

pe 1 diabetes mellitus

www.cdc.gov 6/25/20

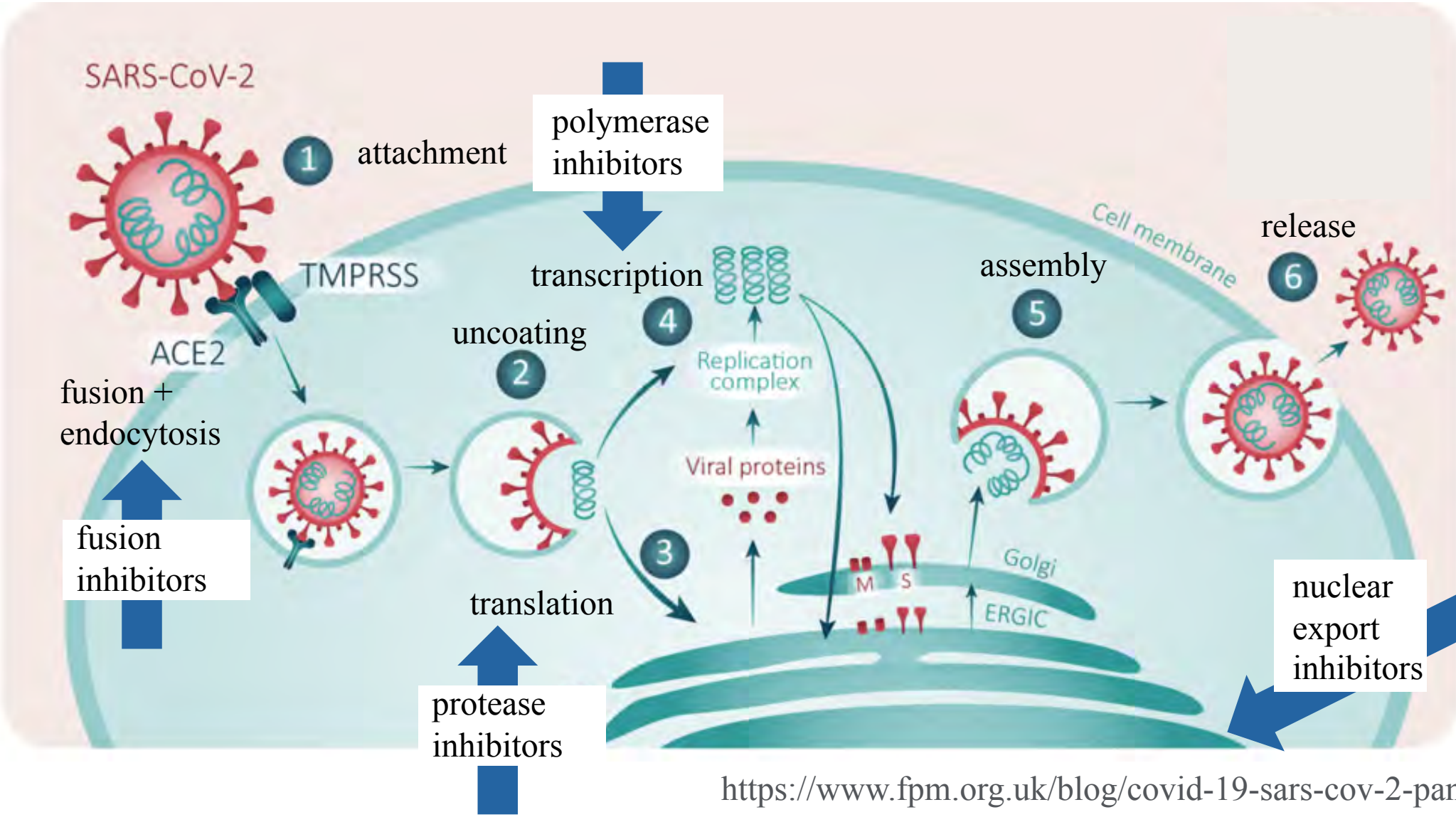
Treatment

COVID-19: Clinical Course and Interventions



Modified from: Biocentury

Life Cycle of SARS-CoV-2



https://www.fpm.org.uk/blog/covid-19-sars-cov-2-par

Coronavirus Proteases and Inhibitors

Replication of SARS-CoV-2 depends on the cleavage of polyproteins into an RNA-dependent RNA polymerase and a helicase.

The enzymes responsible for this cleavage are two proteases:

- 3-chymotrypsin-like protease (3CLpro)
- papain-like protease (PLpro)

HIV-1 protease inhibitors lopinavir/ritonavir evaluated in SARS and MERS

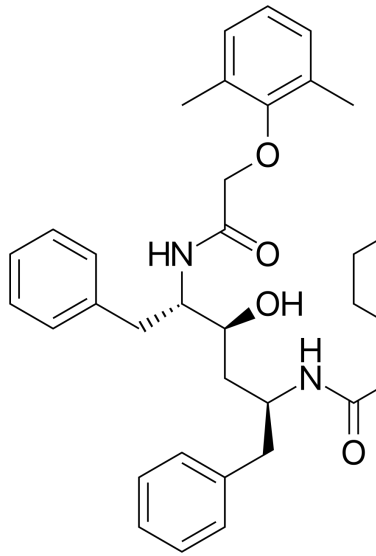
Clinical experience with SARS Chu Thorax, 2004;59:252-256

- Non-randomized trial of 41 patients treated with LPV/r + ribavirin (vs. historical controls)
- Results:
  - ARDS/death at day 21: 2.4% (LPV/r + RBV) vs 29% (historical controls), $p<0.001$

Effective for SARS-CoV-2?

- Protease inhibitors suggested to be tested Morse Chemiochem 2020;21:730-738
- Lopinavir/ritonavir is an inhibitor of SARS-CoV 3CLpro *in vitro*, and this protease appears highly conserved in SARS-CoV-2. Liu J Genet Genomics 2020;47:119-121

opinavir/Ritonavir for COVID-19 (1)



FDA-approved HIV protease inhibitor combination

n vitro activity against SARS-CoV-2

- Pharmacokinetics do not support
  - 60-120X ↑ concentrations required to achieve EC_{50}

  Schoergenhofer Ann Intern Med 2020 (epub 5/12/20)

Randomized, controlled open-label study

- Hospitalized pts with severe COVID-19 (N=199)
- No difference in:
  - time to clinical improvement
  - 28-day mortality
  - detectable viral RNA

Cao NEJM 2020;382:1787-1799

opinavir/Ritonavir for COVID-19 (2)

RECOVERY
domised Evaluation of COVID-19 Therapy

UNIVERSITY OF OXFORD

RECOVERY: 11,500 patients at 175 National Health Service Hospitals in UK

Study pts: Hospitalized pts with COVID-19 (N=6425)

- 4% mechanical vented, 70% on O_2, 26% no O_2 Study rx: randomized to LPV/RTV (n=1596) vs. usual care (n=3376)

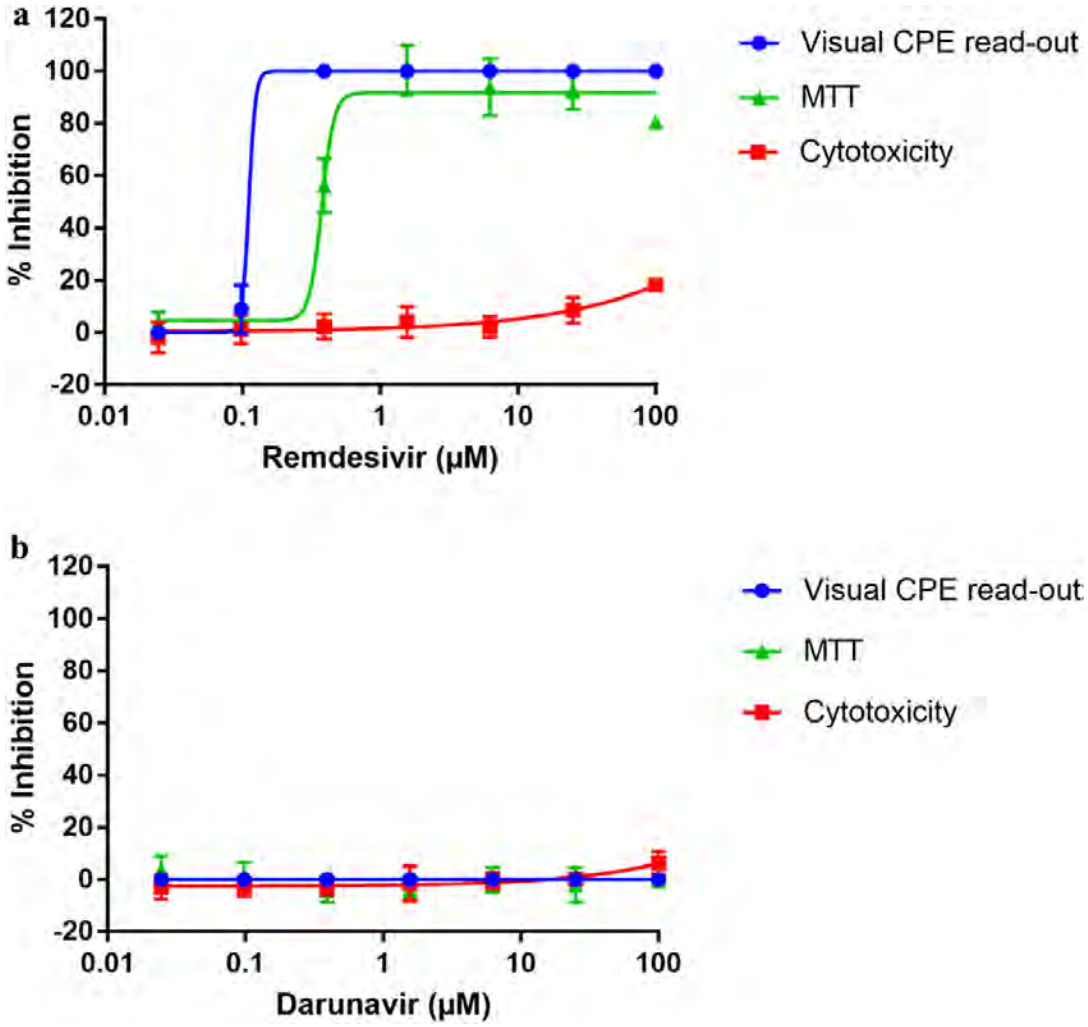
Study stopped early by Trial Steering Committee

Primary endpoint: 28-day mortality:

- 22% (LPV/RTV) vs. 21% (usual care) p=0.58
- Also, no effect on progression to intubation or hospital sta

Press Release 6/29/20

arunavir for COVID-19



CPE = cytopathogenic effect

MTT = Method of assessing CPE

nclusion: DRV has no effect on SARS-CoV-2

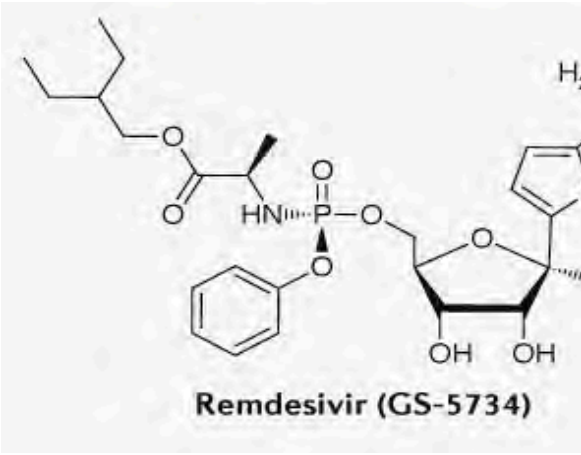
De Meyer S et al Int J Infect Dis 2

NIH COVID-19 Rx Guidelines: Antivirals

- **The panel <u>recommends against</u>:**
  - **Lopinavir/ritonavir (AI)** / other **HIV PIs (AIII)** because of unfavorable pharmacodynamics and negative clinical trial data.

www.covid19treatmentguidelines.nih.gov

emdesivir (RDV)



vestigational antiviral agent
NA polymerase inhibitor – adenine derivative
tiviral activity *in vitro* and animal models
ARS, MERS, and SARS-CoV-2
travenous: 200mg loading dose, then 100mg qd X 5-10 days
sted in a clinical trial for Ebola in >500 individuals

+ De Clercq Nat Rev Drug Discov 2020;19:149

inical trials in COVID-19

Compassionate Use (N=61) Grein NEJM 2020;382:2327-2336

- Moderate and Severe COVID-19

NIH ACTT-1 Randomized Study (N=1063) Beigel NEJM 2020 (epub 5/22/20

- Severe COVID-19

FDA releases Emergency Use Authorization (EUA) 5/1/20

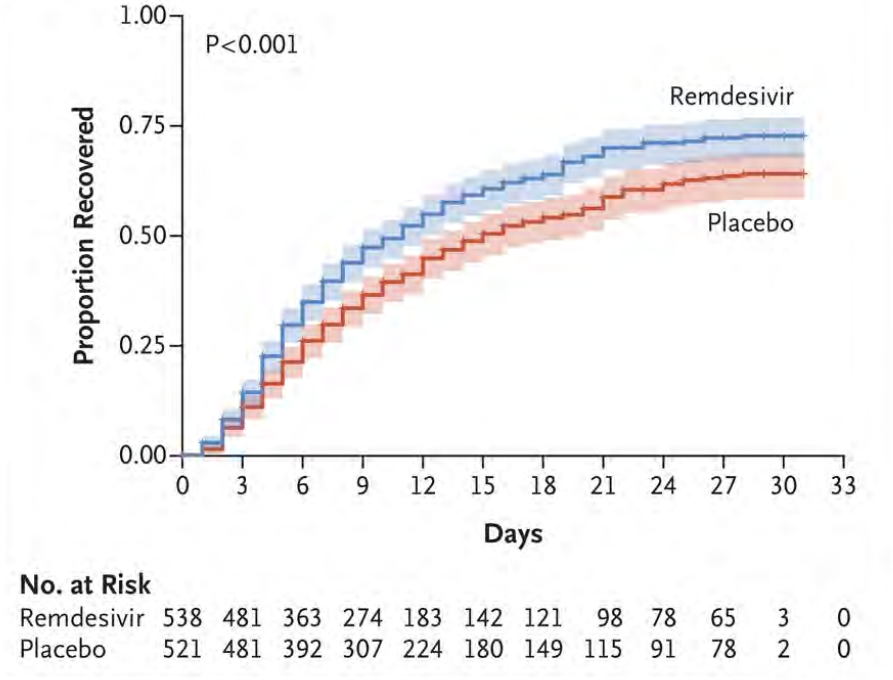
emdesivir (RDV) – ACTT-1 Phase 3 Clinical Stud

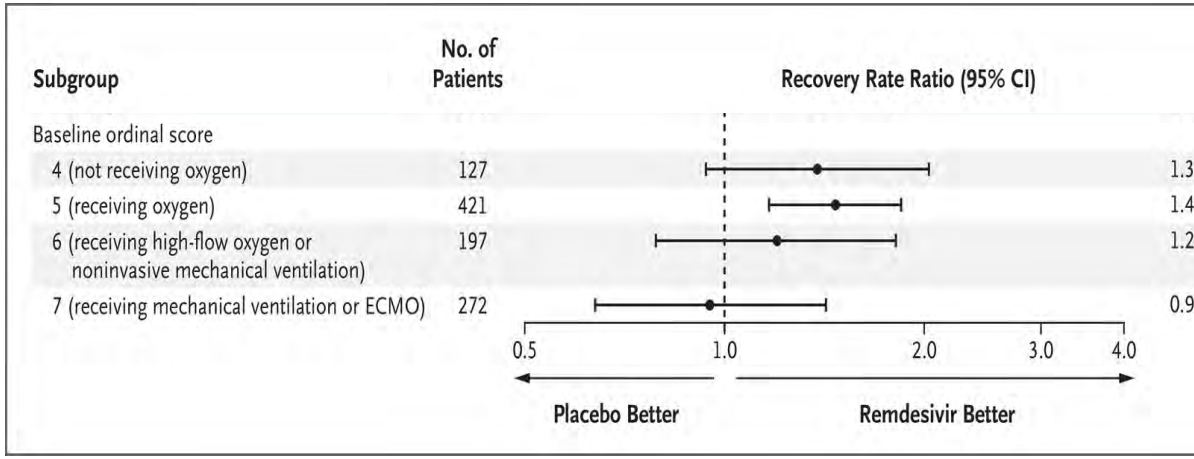
ase 3 multicenter, randomized, double-blind placebo controlled study

dy population: adults hospitalized with COVID-19 with evidence of lower respi
ct involvement (N=1063)

dy treatment: RDV 200mg load →100mg daily X 10 days

dy endpoint: time to clinical recovery (to discharge or equivalent)





nclusion: RDV superior to placebo

Beigel NEJM 2020 (epub 5/22/

NIH Guidelines: Remdesivir

Recommendation for Hospitalized Pts with Severe COVID-19:

The Panel recommends **remdesivir** for treatment of COVID-19 in hospitalized pts with SpO_2 ≤94% on ambient air (at sea level) or those who require supplemental oxygen **(AI)**.

The Panel recommends **remdesivir** for treatment of COVID-19 in pts who are on mechanical ventilation or extracorporeal membrane oxygenation (ECMO) **(BI)**.

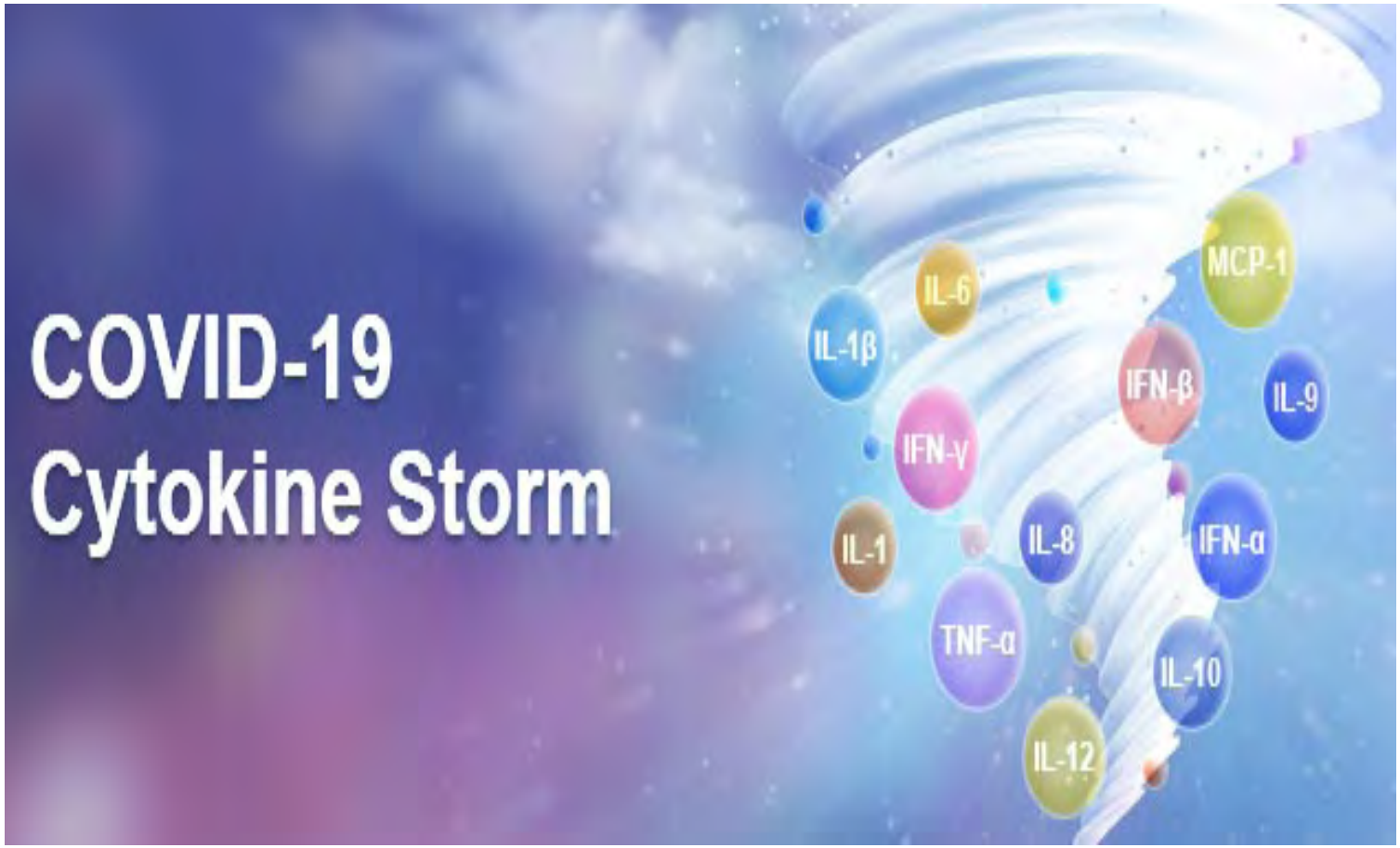
nd also….

ew Remdesivir Formulations:

- subcutaneous for injection
- inhaled

eneric Remdesivir!

Immunomodulators



examethasone

RECOVERY
Randomised Evaluation of COVID-19 Therapy

UNIVERSIT
OXFO

ersity of Oxford

Horby, NEJM 2020 (epub 7/17/20)

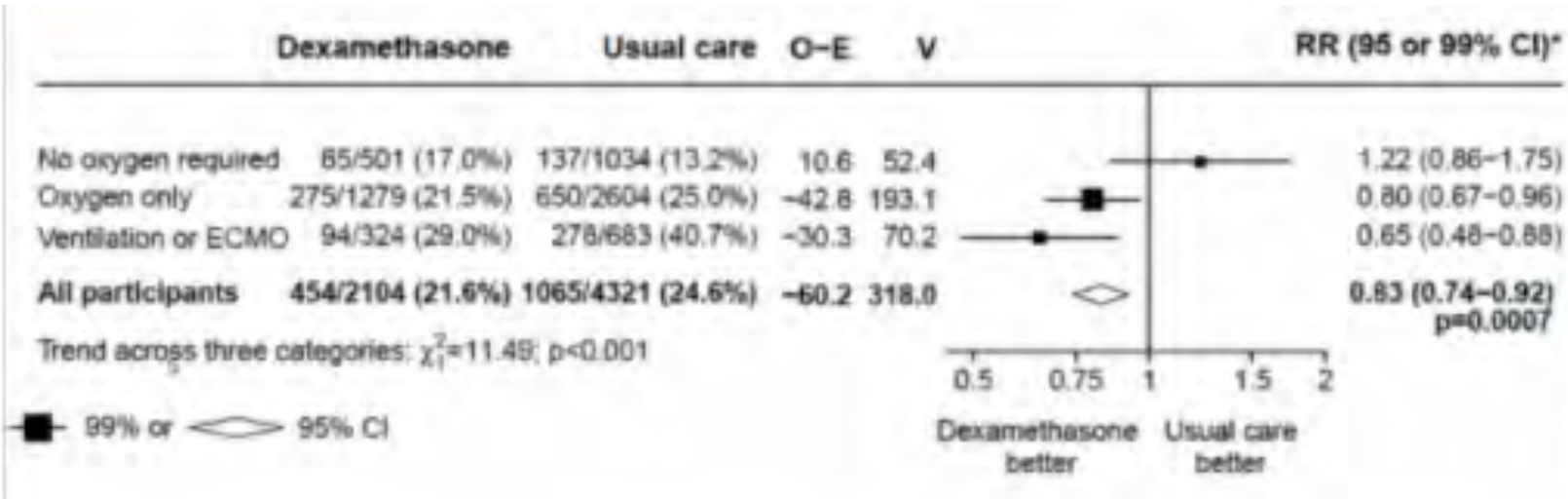
00 patients at 175 National Health Service Hospitals in UK

y pts: Hospitalized pts with COVID-19 (N=6425)

y rx: randomized to dexamethasone 6mg daily X 10 days (or discharge) (n=2104) vs. usu
321)

ary endpoint: 28-day mortality: 482 (23%) on dexamethasone vs. 1110 (26%) usual care

y stopped early by Trial Steering Committee



clusion: Dexamethasone associated with mortality benefit in COVID-19 patients requiring

Prevention

OVID-19 Prevention

There are no proven preventive drugs for COVID-19.

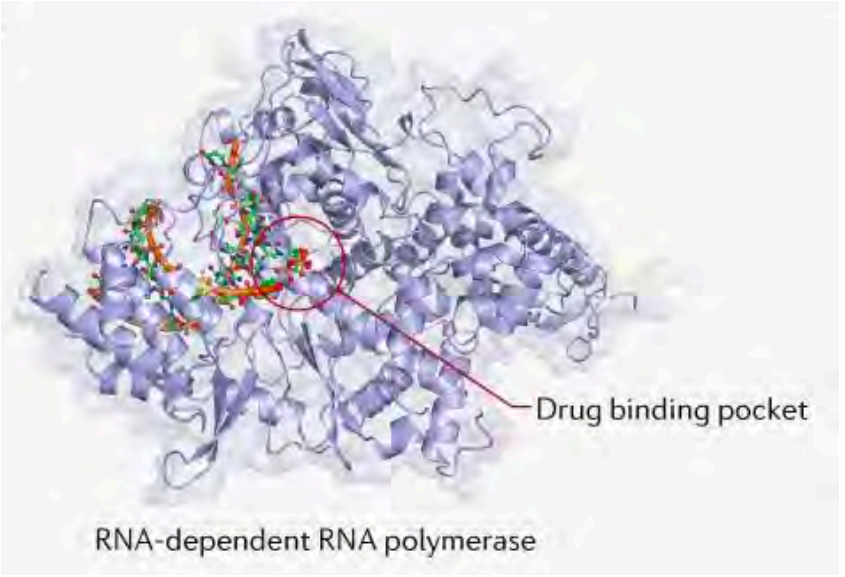
There are no FDA-approved drugs for COVID-19 prevention.

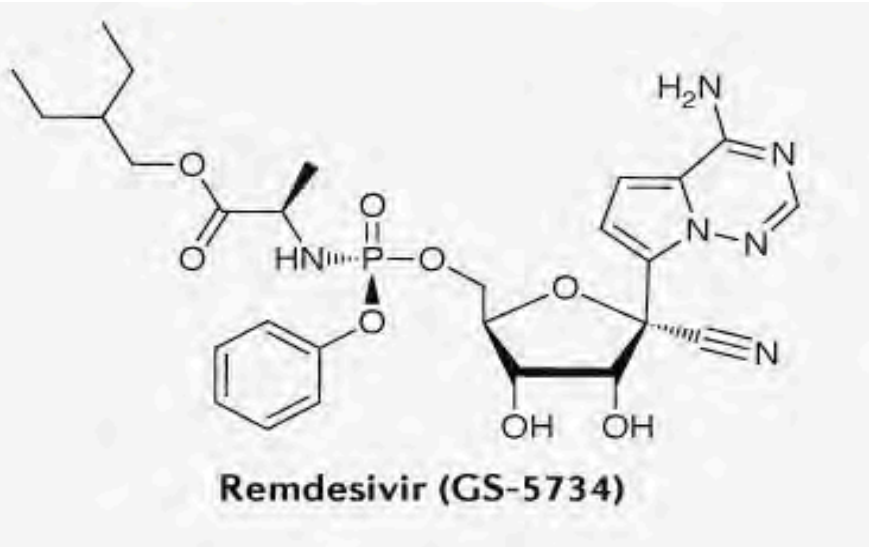
Current standard for prevention is handwashing, masks, social distancing, droplet precautions and PPE.

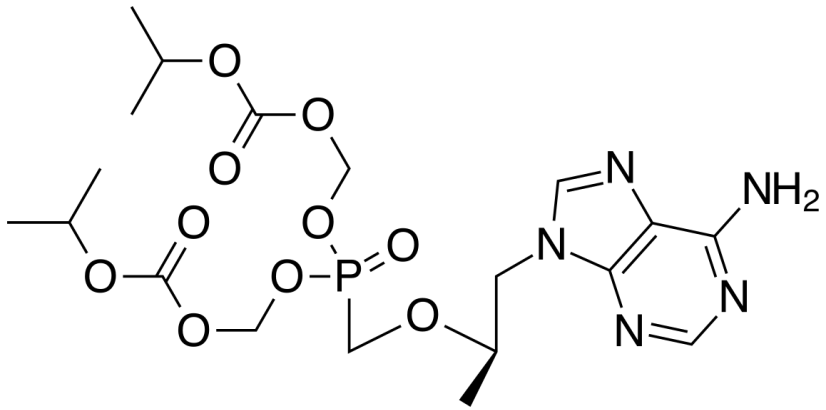
Candidate Preventatives

- Antivirals
- Convalescent plasma
- Hyperimmune globulin
- Vaccines

NA polymerase inhibitors







tenofovir disoproxil fumarate (TDF)

als of Internal Medicine®

al Research 26 Jun 2020

nce and Severity of COVID-19 in HIV-Positive
ns Receiving Antiretroviral Therapy

ort Study

anish Hospitals
590 HIV+ persons on ART
NRTI
- TDF/FTC 16%
- TAF/FTC 33%
- ABC/3TC 26%
- Other 25%

3rd drug
- NNRTI 21%
- PI 19%
- Integrase 50%
- Other 10%

dx'ed with COVID-19
151 were hospitalized
15 were admitted to ICU
20 died

Table 2. **Risk per 10 000 Persons for PCR-Confirmed COVID-19 Diagnosis, Hospital Admissio ICU Admission, and Death Among 77 590 HIV-Positive Persons Receiving ART, 1 February t April 2020, Spain**

Characteristics	COVID-19 Diagnosis (95% CI)	COVID-19 Hospital Admission (95% CI)	COVID-19 ICU Admission (95% CI)	COVID Dea (95%
Risk				
Overall	30.4 (26.7–34.6)	19.5 (16.5–22.8)	1.9 (1.1–3.2)	2.6 (1.6
Standardized*	30.0 (29.8–30.2)	17.8 (17.7–18.0)	2.5 (2.4–2.6)	3.7 (3.6
Sex				
Men	35.1 (30.4–40.3)	23.4 (19.6–27.7)	2.1 (1.1–3.6)	2.8 (0.6
Women	16.4 (11.2–23.2)	7.7 (4.3–12.7)	1.5 (3–4.5)	2.1 (0.6
Age, *y*				
20–39	28.3 (20.3–38.3)	10.3 (5.8–17.6)	0.7 (0–3.8)	0 (–2
40–49	27.9 (20.9–36.4)	20.1 (14.3–27.5)	0.5 (0–2.9)	1.0 (0.1
50–59	26.3 (21.0–32.5)	16.7 (12.6–21.8)	2.2 (0.9–4.5)	2.2 (0.9
60–69	38.8 (26.9–54.2)	27.4 (17.6–40.8)	4.6 (1.2–11.7)	4.6 (1.2-
70–79	83.7 (52.4–126.7)	72.3 (43.5–112.9)	7.6 (0.9–27.5)	26.6 (1 54.9
NRTI				
TDF/FTC	16.9 (10.5–25.9)	10.5 (5.6–17.9)	0 (–2.9)†	0 (–2.
TAF/FTC	39.1 (31.8–47.6)	20.3 (15.2–26.7)	2.7 (1.1–6.5)	3.9 (1.9
ABC/3TC	28.3 (21.5–36.7)	23.4 (17.2–31.1)	3.0 (1.1–6.5)	4.0 (1.7
Other regimens	29.7 (22.6–38.4)	20.0 (14.2–27.3)	1.0 (0.1–3.7)	1.0 (0.1

57% ↓

Del Amo, Ann Intern Med 2020 (epub 6/26/

Western Cape / South Africa

Effect of different ARVs on COVID-19 death among cases with HIV on ART

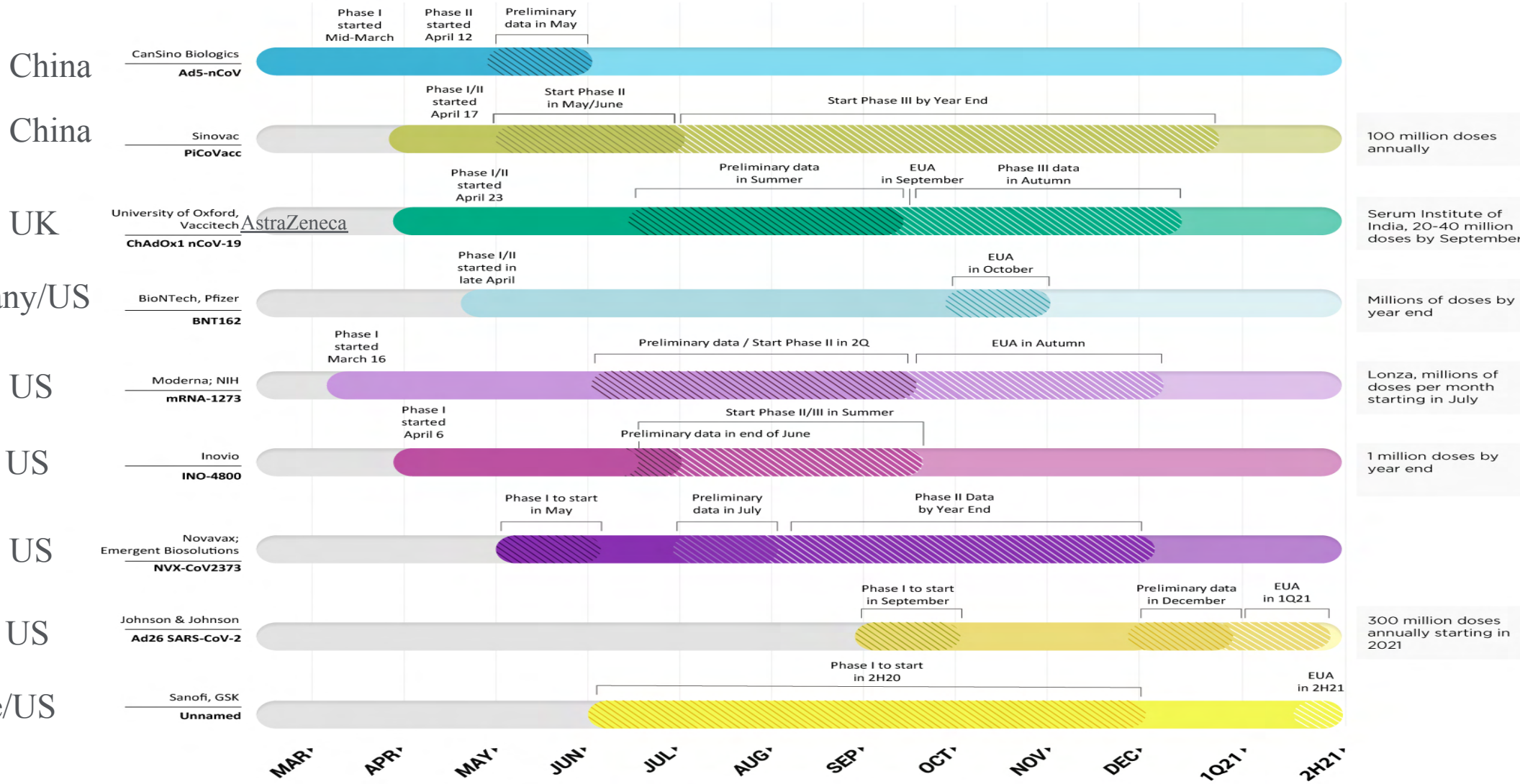
N=3903 COVID-19 cases and 115 COVID-19 deaths

Until January 2020

- First-line: TDF + XTC + EFV unless renal failure
- Second-line: ZDV + XTC + LPV
- DTG introduced from January 2020

Davies IAS 2020 #OAXLB01

SARS-CoV-2 Vaccines



BIOCENTURY

moderr

Phase 3 COVID-19 Vaccine Trial

Phase 3, randomized, stratified, observer-Blind, placebo-controlled study

bjective: To evaluate the safety, efficacy, and immunogenicity of mRNA-1273 ARS-CoV-2 Vaccine

udy participants: adults, at least 18 years old without known history of COVID t at-risk (N=29,290)

- stratified by:
  - age <65 or ≥65 years old
  - risk for severe illness (chronic lung disease, moderate--severe asthm serious heart conditions, immunocompromised, severe obesity, diabe chronic kidney disease undergoing dialysis, liver disease)

udy intervention: vaccine vs. placebo, 2 injections given 28 days apart

imary endpoints: PCR-confirmed COVID-19; local/systemic adverse events

Guidelines

HS HIV Guidelines: Guidance for All Persons with H

- Help persons with HIV maintain adequate supply of ART and concomitant medications.
- Influenza and pneumococcal vax should be kept up to date.
- Persons with HIV should follow all applicable recommendations of the U.S. CDC to prevent COVID-19, such as social distancing and proper hand hygiene.
- CDC also provides information about COVID-19 prevention during pregnancy and for children.

www.aidsinfo.nih.gov

HHS Guidelines: Guidance for HIV and COVID-

- Highest risk of life-threatening COVID-19: age >60, diabetes, HTN cardiovascular disease, pulmonary disease, or obesity .
- Limited data indicate COVID-19 does not differ in persons with/ without HIV.
- Before ART, advanced HIV infection (i.e., CD4 cell count <200) wa a risk factor for complications of other respiratory infections. Unknown for COVID-19.
- People with HIV have comorbidities (e.g., CV disease, lung diseas smoking) that increase the risk of severe COVID-19.
- Additional caution for all persons with HIV, especially those with advanced HIV or poorly controlled HIV, is warranted.

www.aidsinfo.nih.gov

DHHS Guidelines: ART and COVID-19

ersons with HIV Should:

- Maintain on-hand at least a 30-day (ideally 90-day) supply of ART a other medications.
- Explore changing to mail order delivery of medications when possib
- Delaying any ART switch until close follow-up and monitoring are possible.
- To date, no drug has been proven to be safe and effective for treatin COVID-19. Some ARV agents (e.g., LPV/RTV, boosted DRV, TDF/ FTC), are being evaluated in clinical trials or are prescribed for off la use for the treatment or prevention of COVID-19.
- Do not switch or add ARV drugs to prevent or treat SARS-CoV-2 nfection.

www.aidsinfo.nih.gov

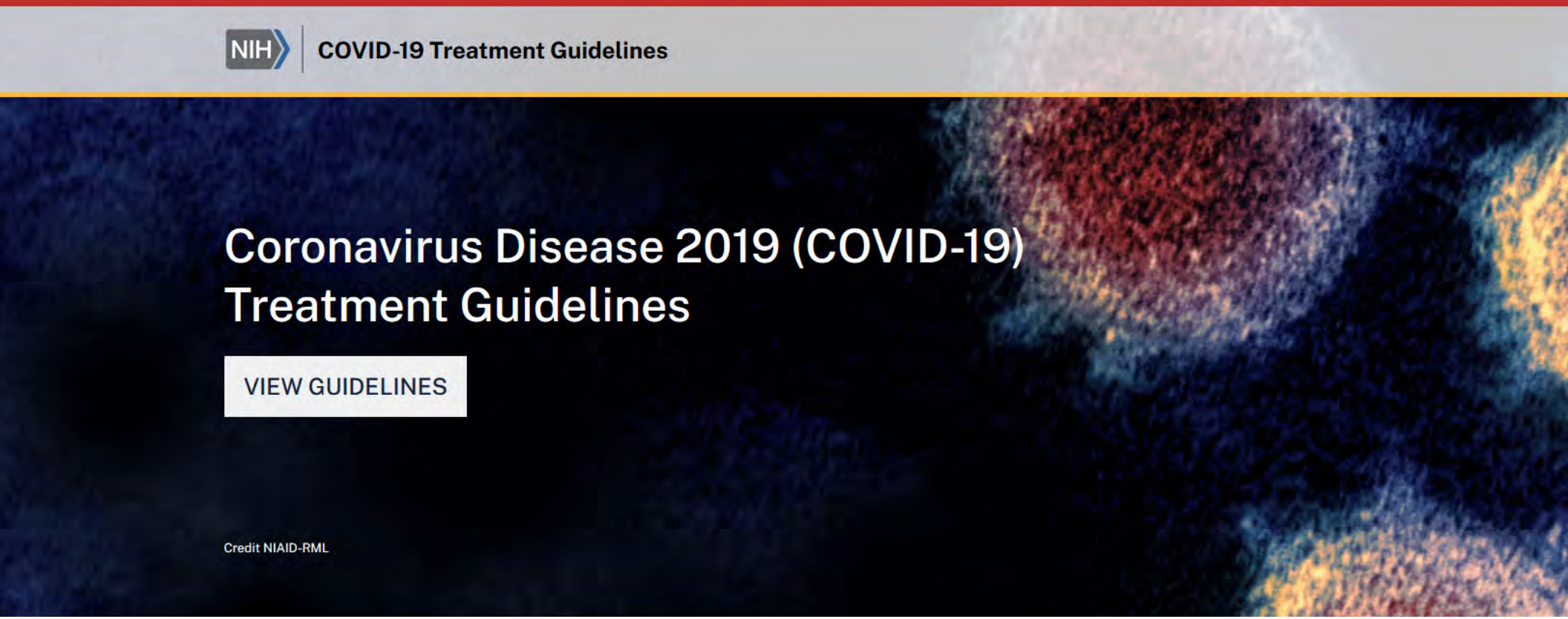
IHS Guidelines: *Visits Related to HIV Care*

Weigh risks and benefits of attending, versus not attending in-person, HIV-related clinic appointments at this time. Factors to consider include the extent of local COVID-19 transmission, the health needs that will be addressed during the appointment, and the person's HIV status (e.g., CD4 cell count, HIV viral load) and overall health.

Telephone or virtual visits may replace face-to-face encounters.

For persons who have a suppressed HIV viral load and are in stable health, routine medical and laboratory visits should be postponed to the extent possible.

w.covid19treatmentguidelines.nih.gov



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hanks to:

Weill Cornell Division of ID, Department of Medicine, Joint Clinical Trials Office (JCTO)
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Thank You for Your Attendance!
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