




**COVID UPDATES:
WHERE WE ARE &
WHERE WE GO FROM HERE**

Janice Gabrilove, MD, FACP
*James F. Holland Professor of Medicine
Associate Director, Education & Training
Tisch Cancer Institute
Director of Clinical Research
Icahn School of Medicine
Mount Sinai Hospital
New York, NY*


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WELCOMING REMARKS



Elissa Baldwin
**Sr. Manager, Education Programs
The Leukemia & Lymphoma Society**



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SUPPORTER ACKNOWLEDGEMENT

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DISCLOSURES

Dr. Gabilove has no disclosures.



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A Guide to our Discussion Today

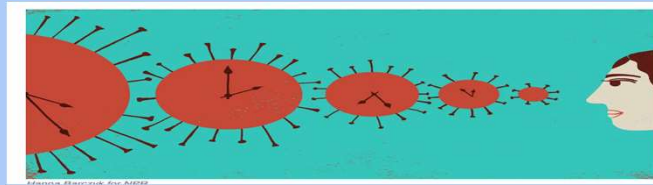
- Overview with an optimistic lens: where we started and where we are heading
- SARS CoV-2 Variants: what are they and why do we care?
- Immune response to COVID19; how this informs risk and treatment
- Vaccination and implications for health
- Challenges in patients with hematologic malignancies and current recommendations
- Restoration of Well Being after COVID19
- A practical Guide: best practices to avoid COVID19

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SARS CoV-2

- Remains an active concern for immune compromised patients
- Vaccination remains the mainstay with added therapeutic modalities to complement this approach
- Moving from dreadful disease to a milder, more manageable disease over time, following the path of other coronaviruses, as predicted by experts employing computer models
- Requires sustained **long lasting immunity against severe disease among populations, not prevention of transmission or mild disease**



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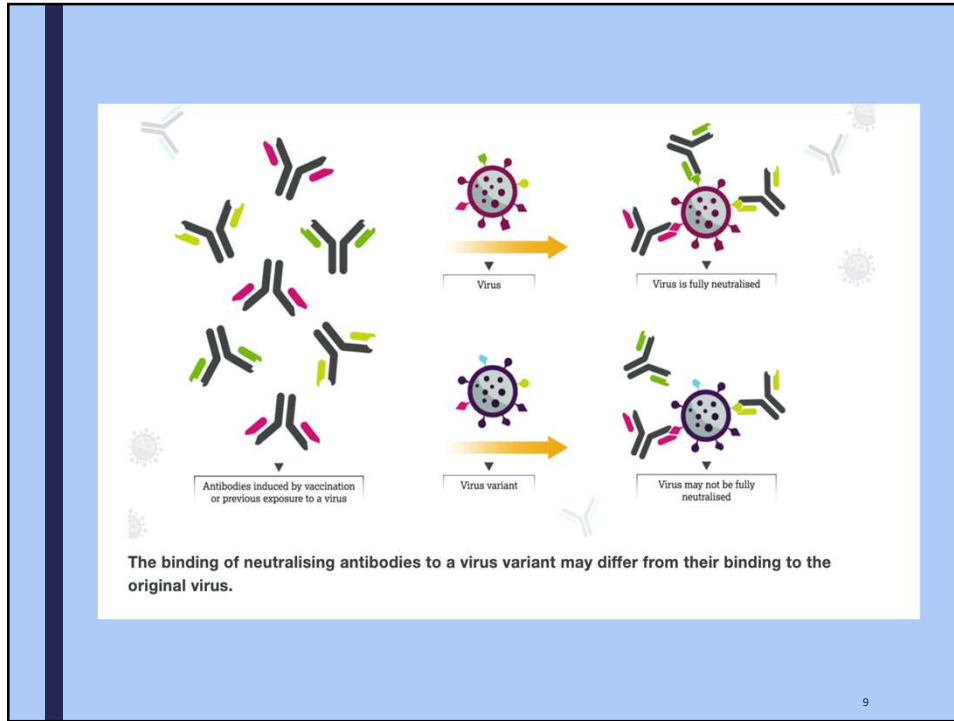
SARS-CoV-2*

- Virus variants arise from mutations in the viral genome and are natural byproducts of viral replications
 - *A mutation refers to a single change in a virus' genetic code. Mutations happen frequently but only sometime change the characteristics of the virus*
- A variant is a virus with a genetic code that has been altered by one or more mutations. In some cases, a group of variants, with similar genetic changes, that give rise to shared characteristics or attributes, may be designated as:
 - *Variant being monitored*
 - *Variant of concern*
 - *Variant of interest*
- Classification is given to variants that:
 - *Possess properties associated with increased transmissibility,*
 - *Could potentially cause more severe disease,*
 - *May be resistant to antibodies from previous infections or vaccination*
 - *Show an ability to evade diagnostic detection.*

CDC Website

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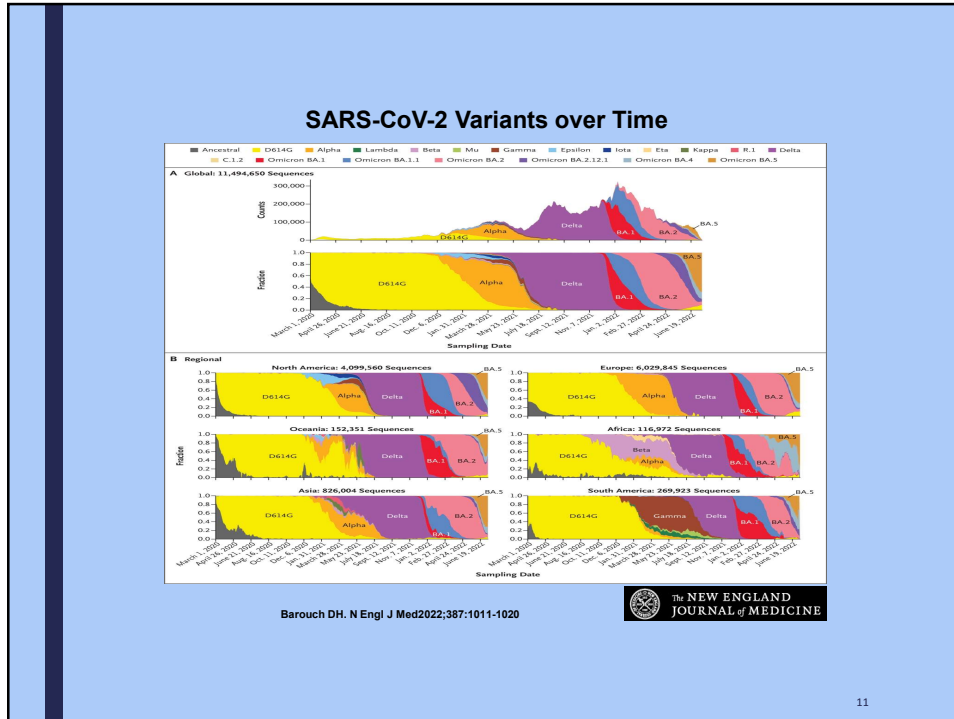


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Lineage	Variant	Time Appeared	Transmissibility	Severity of Disease	Break-thru Infections
	Ancestral	2019			
B.1.1.7	Alpha	November, 2020			
	Beta	End of 2020	50% more than Alpha	More likely to result in hospitalization & mortality	
B.1.617.2	Delta	Late 2020	Twice as much as Beta	More severe in unvaccinated	Some
AY.4.2	Delta+		10-20% more than Delta		
BA.1, BA.1.1, BA.2, BA.3, BA.4 BA.5	Omicron	November, 2021	More than others		More
BQ.1, BQ.1.1, BQ.1.1			More than BA strains		
Other: XBB (emerged from prior BA variants), Gamma, Epsilon, Eta, Iota, Kappa, Mu, Zeta, 1.617.3.					

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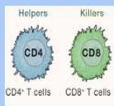



Immune Response Against SARS-CoV-2*

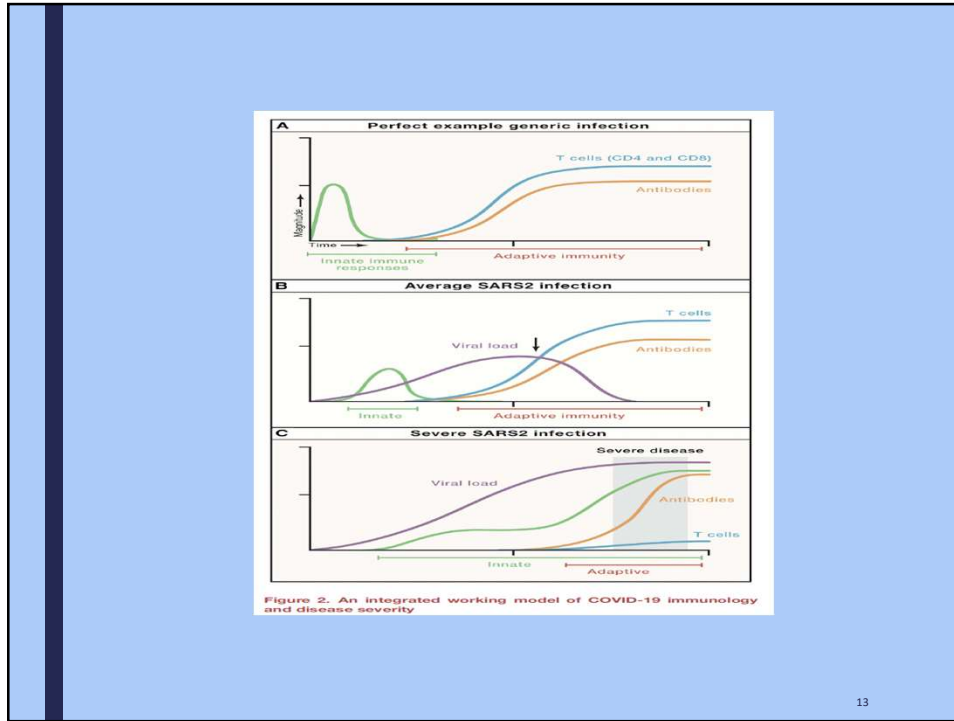
Innate Immune Response

- First line of defense
- Triggered when host recognizes something foreign has arrived
- Gives rise to release of Cytokines
 - Cytokine storm
 - Need for Therapeutic blockade
- Neutrophils, Monocytes/macrophages, dendritic cells, NK cells

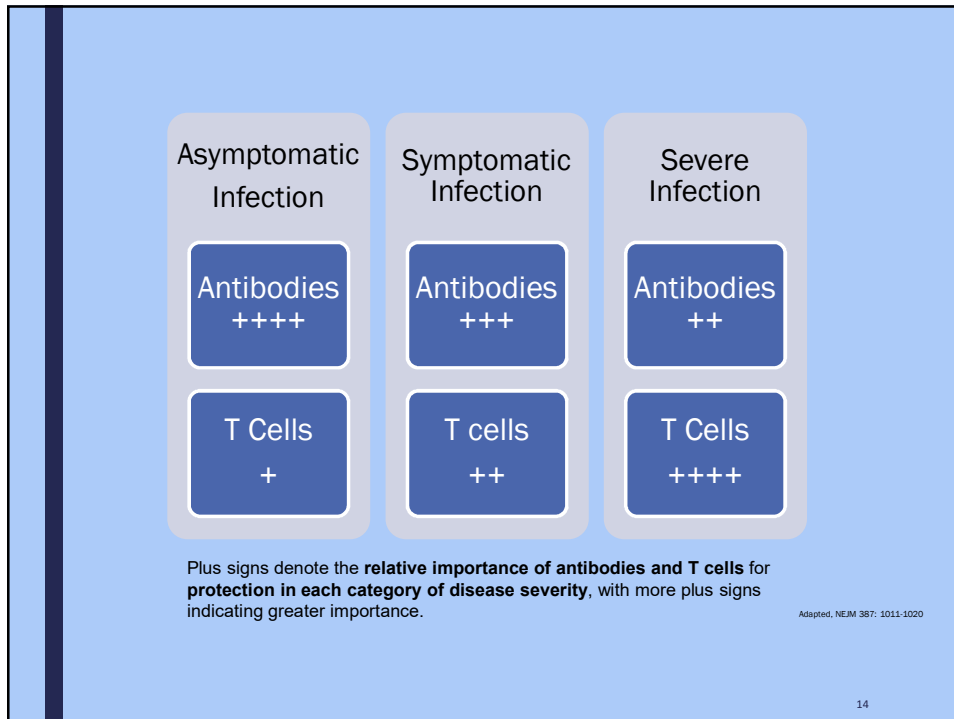
Adaptive Immune Response

- Humoral – Antibodies 
- Cellular – T Cells
 - CD8 – eliminate virally infected cells 
 - CD4 – provide help to support the rest of the immune system 
 - Controls viral replication
 - Particularly important for long term protection against severe disease

* Adapted from Cell 184, Feb 18, 2021




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Vaccines

- Inactivated virus
- Messenger RNA (mRNA)**
Moderna, Pfizer-BioBTech
- Adenovirus vector**
AstraZeneca, J&J
- Adjuvanted protein**
Novavax
- Other**

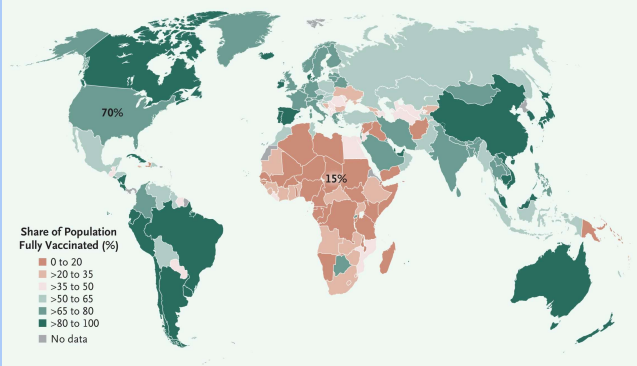


Yale website

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Global Covid-19 Vaccination Rates



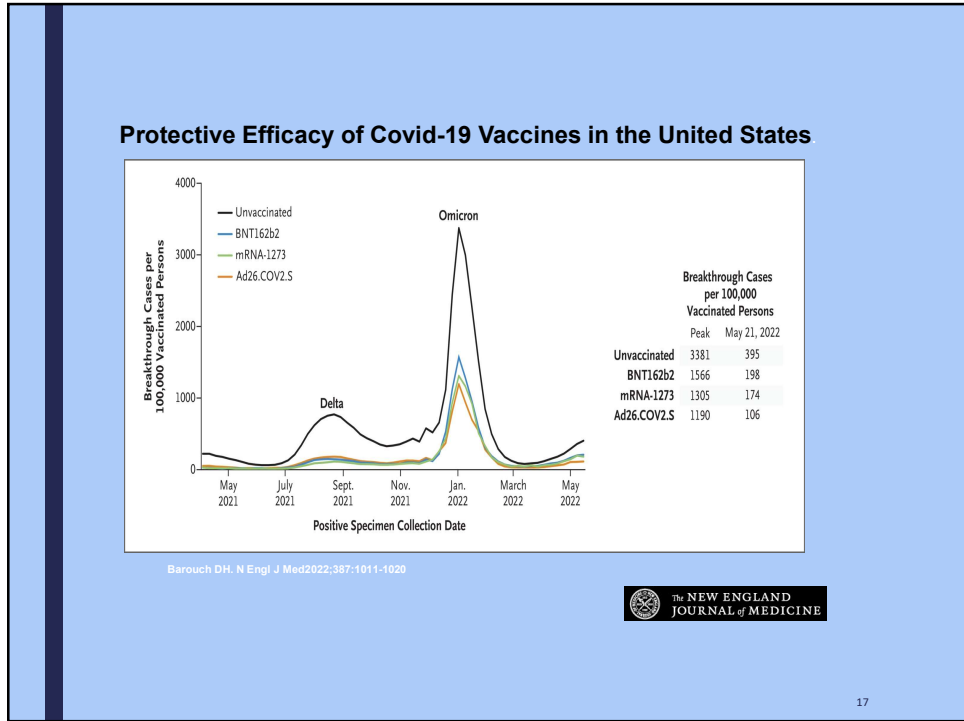
Barouch DH. N Engl J Med 2022;387:1011-1020, September, 2022

Estimated: global COVID-19 vaccination has saved 20 million lives during 1st yr of roll out



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Protective Efficacy of Coronavirus Disease 2019 (Covid-19) Vaccines against the Ancestral Viral Strain in the United States and against the Omicron Variant in South Africa.

Table 1. Protective Efficacy of Coronavirus Disease 2019 (Covid-19) Vaccines against the Ancestral Viral Strain in the United States and against the Omicron Variant in South Africa.

Vaccine (Dose)	Efficacy against Symptomatic Disease		Efficacy against Hospitalization	Efficacy against ICU Admission
	United States, Ancestral Strain*		South Africa, Omicron Variant†	
	percent		percent	
Pfizer BNT162b2 (two shots)	95	70	70	
Moderna mRNA-1273 (two shots)	94	ND	ND	
Janssen Ad26.COV2.S (two shots)	94	72	82	
Janssen Ad26.COV2.S (one shot)	72	ND	ND	

* Data on protective efficacy of vaccines against symptomatic Covid-19 in the United States are from randomized, placebo-controlled phase 3 clinical trials.^{14,17} Interim efficacy data before the emergence of the omicron variant are shown for each vaccine. The global efficacy of Ad26.COV2.S was lower, at 66% for the one-shot vaccine and 75% for the two-shot vaccine, as a result of the beta, lambda, and mu variants in Africa and South America.

† Shown are data on clinical effectiveness of BNT162b2 and Ad26.COV2.S against hospitalization and admission to the intensive care unit (ICU) during the omicron surge in South Africa (November 15, 2021, to January 14, 2022).¹⁸ Data are for effectiveness 1 to 2 months after the second immunization. ND denotes no data.

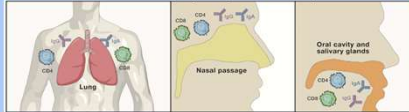
Barouch DH. N Engl J Med 2022;387:1011-1020

The NEW ENGLAND JOURNAL of MEDICINE

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Immunologic Impact of Vaccination

- Prior boosting increases neutralizing antibodies to omicron but wane over time
- T cell responses induced by vaccines have > 80% cross reactivity to omicron and to prior variants
- Hybrid immunity from both vaccination and infection provides greater and more durable protection than either alone
- Role of specific mucosal humoral and cellular immunity at site of inoculation may play an important role



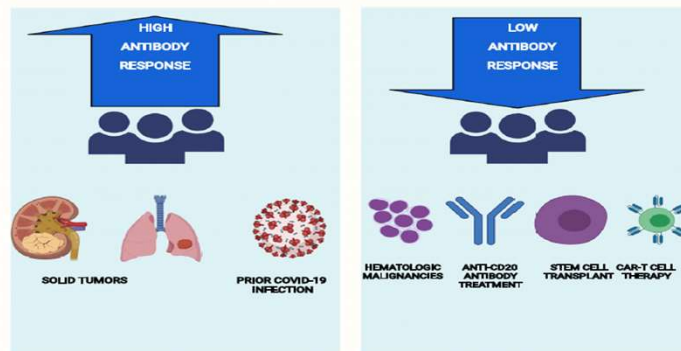
Cell 184, Feb 18, 2021

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IMMUNOGENICITY OF COVID-19 VACCINES IN CANCER PATIENTS: RESULTS FROM A CROSS-SECTIONAL STUDY

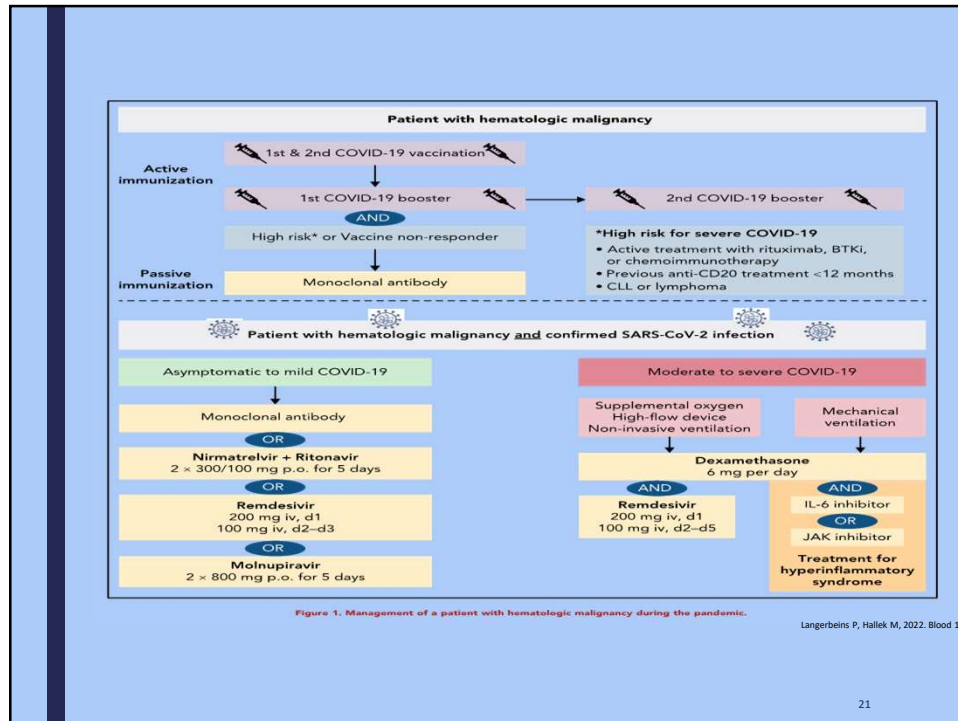
Two hundred patients with cancer demonstrated 94% seropositivity to COVID-19 Vaccines



Cancer Cell 39: 1081-1090, 2021

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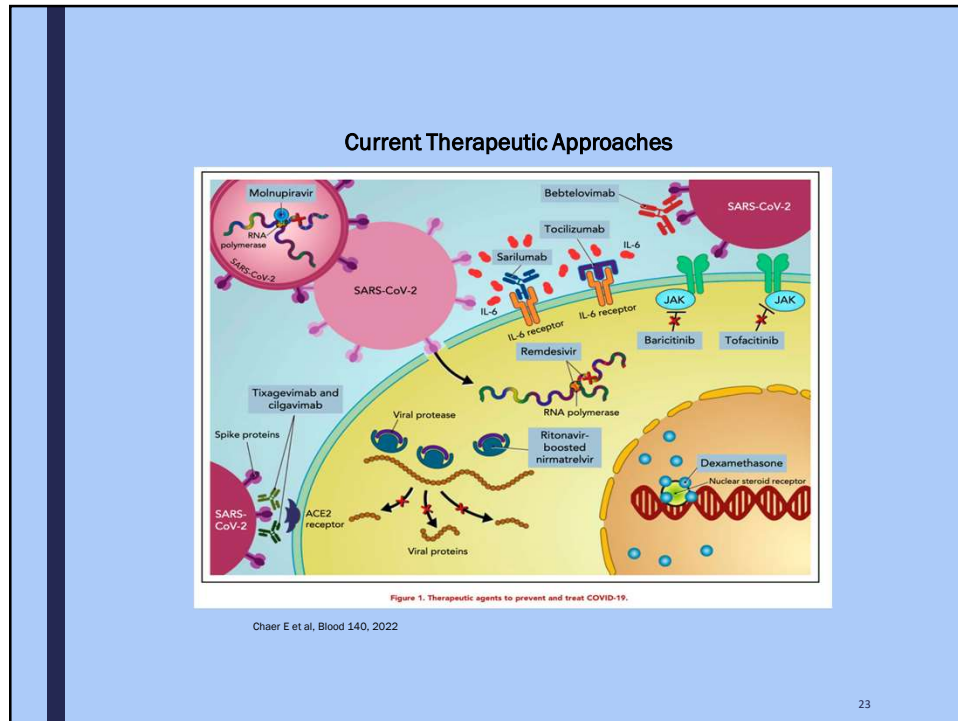


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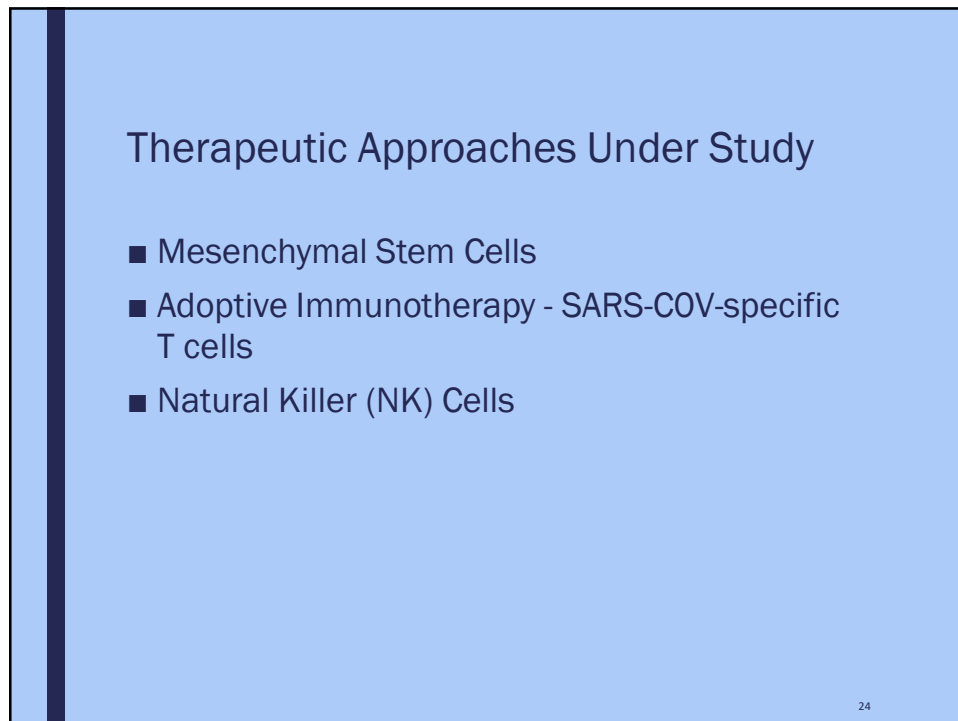
COVID19 in Patients with Hematologic Malignancies and recipients of cellular therapies

- Increased risk for
 - Prolonged viral shedding
 - More protracted course, especially in lymphoid malignancies
 - Reinfection or reactivation
 - More severe disease
- Severity associated with:
 - Degree and duration of neutropenia
 - Degree of Impaired T cell function; in contrast intact T helper and/or T suppressor can compensate for impaired humoral immunity; and
 - Hypogammaglobulinemia

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Restoration of Well-Being after COVID19 infection

Post Covid Symptom	Persons most vulnerable	Timing	Cause	Treatment/Prevention
Weight Loss	All	During acute infection	Immune system cytokine production	Nutrition & Diet
Smell disruption	Younger female adults	Presenting symptom, or early post COVID period	Viral injury to	Retraining sense of smell
Depression	Younger adults Individuals with other medical problems	Up to one year post infection	Sleep disruption Immune system cytokine production Changes in gut microbiome & neurotransmitter production	Exercise Meditation Discontinuation of alcohol Medical interventions
Autoimmune phenomenon	Symptomatic men; Asymptomatic women	Post infection	Antibody generation to normal cellular material	Maintenance of normal nutrition, sleep and exercise

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Protection against COVID19: a Practical Guide

- Get a Flu Shot
- Enjoy the outdoors, dressed for the occasion
- Maintain good general and oral hygiene as well as handwashing
- Maintain good nutrition as much as possible
- Avoid noisy crowded indoor places at peak hours and for extended periods of time, especially around the holidays
- Be selective about outings
- Self-care & stress reduction
- Wear a N95 mask that fits well when visiting indoor places
- Avoid poorly ventilated indoor spaces; where possible open windows
- Alert your healthcare provider about any symptoms to allow for timely intervention
- Correct Vitamin D Deficiency

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LLS EDUCATION & SUPPORT RESOURCES

HOW TO CONTACT US:

To contact an **Information Specialist** about disease, treatment and support information, resources and clinical trials:

-  **Call: (800) 955-4572**
Monday to Friday, 9 a.m. to 9 p.m. ET
-  **Chat live online: www.LLS.org/InformationSpecialists**
Monday to Friday, 10 a.m. to 7 p.m. ET
-  **Email: www.LLS.org/ContactUs**
All email messages are answered within one business day.



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LLS EDUCATION & SUPPORT RESOURCES

LEUKEMIA & LYMPHOMA SOCIETY™ ONLINE CHATS




Online Chats

Online Chats are free, live sessions, **moderated by oncology social workers**. To register for one of the chats below, or for more information, please visit www.LLS.org/Chat



Education Videos

Community of blood cancer patients, survivors and caregivers supporting each other and giving trusted information and resources, please visit www.LLS.org/EducationVideos



Protecting Patients: COVID and Vaccine Updates

Patient Podcast

The Bloodline with LLS is here to remind you that after a diagnosis comes hope. To listen to an episode, please visit www.TheBloodline.org

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LLS EDUCATION & SUPPORT RESOURCES

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Help With Finances
The Leukemia & Lymphoma Society (LLS) offers financial assistance* to help individuals with blood cancer.

The LLS Patient Aid Program provides financial assistance to blood cancer patients in active treatment. Eligible patients will receive a \$100 stipend. Visit www.LLS.org/PatientAid

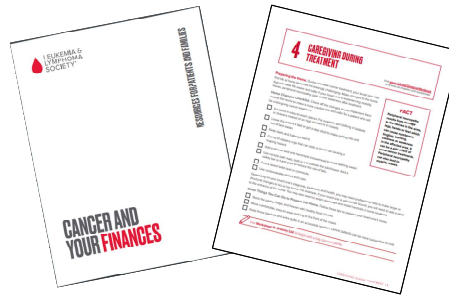
The Urgent Need Program, established in partnership with Mopple's Love, helps pediatric and young adult blood cancer patients, or adult blood cancer patients who are enrolled in clinical trials, with acute financial need. The program provides a \$500 grant to assist with non-medical expenses, including utilities, rent, mortgage, food, lodging, dental care, child care, elder care, and other essential needs. Visit www.LLS.org/UrgentNeed

The Susan Leng Pay-It-Forward Patient Travel Assistance Program provides blood cancer patients a \$500 grant to assist with transportation and lodging-related expenses. Visit www.LLS.org/Travel

The Co-Pay Assistance Program offers financial support toward the cost of insurance co-payments and/or insurance premiums for prescription drugs. Visit www.LLS.org/Copay

*Funding for LLS Co-pay Assistance Program is provided by pharmaceutical companies. Funding for the other LLS financial assistance programs are made by donations from individuals, donors, companies, and LLS campaigns.

The Leukemia & Lymphoma Society (LLS) offers the following financial assistance programs to help individuals with blood cancer: www.LLS.org/Finances



To order free materials: www.LLS.org/Booklets



THANK YOU

Please fill out Program Evaluation at LLS.org/CovidEval

We have one goal: A world without cancers

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