CLINICAL STUDIES IN MYELODYSPLASIA

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OBJECTIVES

▶ What is a clinical trial?

▶ What is involved in participating in a clinical trial?

► How to find the most up-to-date information about clinical trials.

WHAT ARE CLINICAL TRIALS AND WHY DO WE PERFORM THEM?

- ▶ What is a clinical trial?
 - tests how a drug, medical device, or treatment approach works in people
- Why do we engage in clinical trials?
 - Answer scientific questions
 - Test new ways to
 - prevent
 - detect
 - diagnose
 - treat
 - Treatment trials
 - test new treatment options

- Diagnostic trials
 - test new ways to diagnose a disease
- Screening trials
 - test the best way to detect a disease or health problem.
- Quality of life (supportive care) trials
 - study ways to improve the comfort of people with chronic illness
- Prevention trials
 - look for better ways to prevent disease in people who have never had the disease.



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PHASES OF DRUG CLINICAL TRIALS

► Phase I:

• Tests a new drug or treatment in a small group to see if it is safe.

► Phase II:

• Expands the study to a larger group of people to find out if it works.

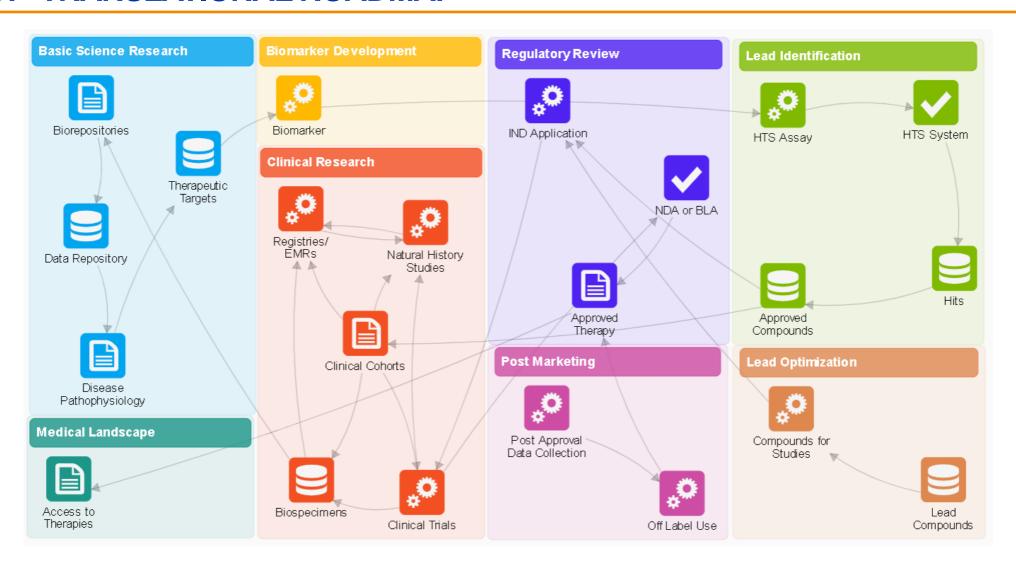
► Phase III:

- Expands the study to an even larger group of people to compare it to the standard treatment for the disease.
 - Randomized
 - Placebo controlled
 - Blinded
 - Single vs double blinded

▶ Phase IV

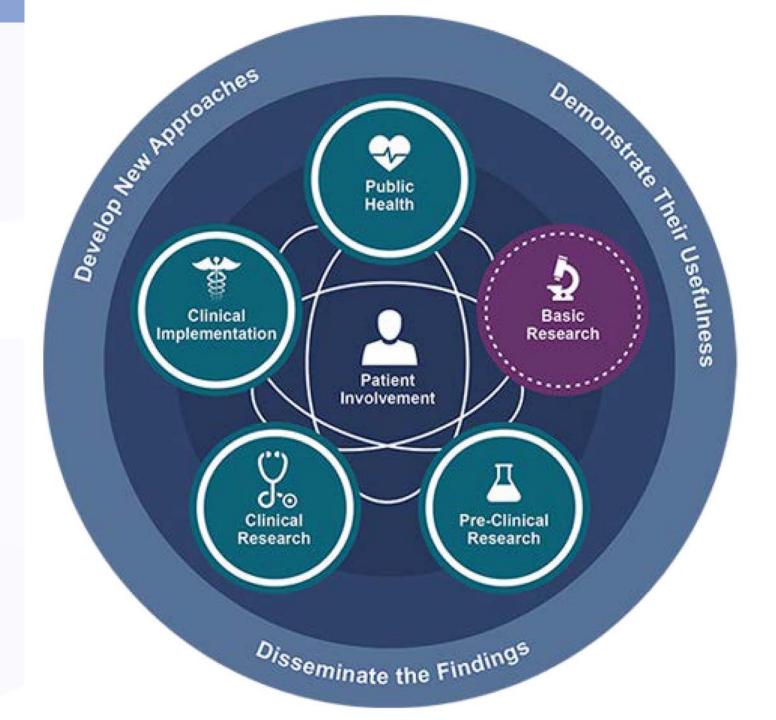
• Takes place after the drug or treatment has been licensed and marketed to find out the long-term impact of the new treatment.

NIH-TRANSLATIONAL ROADMAP



TRANSLATIONAL SCIENCE SPECTRUM

- biological basis of health and disease to interventions that improve the health of individuals and the public
- not linear or unidirectional
- Patient involvement is a critical feature of all stages in translation



RISKS AND BENEFITS

▶ Benefits

- access to promising new procedures or treatments that are generally not available outside of a clinical trial.
- The new procedure or treatment being studied may be more effective than the current usual approach.
- Trial participants receive high-quality medical care from a research team that includes doctors, nurses, and other health professionals.
- The results of the trial may help other people who need medical care in the future.
- Trial participants are helping scientists learn more about cancer and other medical conditions, which will lead to more advances.

RISKS AND BENEFITS

► Risks

• The new procedure or drug may not be better than what is currently available, or it may have side effects that doctors do not expect or that are worse than the side effects of the current usual approach.

• Trial participants may be required to make more visits to the doctor than they would if they were not in a clinical trial and/or need to travel farther for those visits.

• Some of the costs of participating in a trial may not be covered by health insurance.

WHAT IS A CLINICAL TRIAL?

- ► Clinical trials follow a protocol which is written to meet strict, scientific standards to produce reliable results while at the same time protecting the participants
 - Very specific goals
 - Strict eligibility criteria
 - Specific duration of the study
 - specific information to be gathered is specified
 - Protections against risks to participants and their privacy
 - Informed consent
 - Details about tests, procedures, and treatments

Evaluates:

- Safety & efficacy of new treatments
- It may compare new treatments to standard treatments
- It may assess an individual's Quality of life with a type of disease and/or during a specific treatment

MEMBERS OF THE RESEARCH TEAM

1. Lead physician, scientist, or nurse researcher-primary investigator (PI)

2. Other clinicians: physicians, nurse practitioners, or scientists (Sub-Investigators)

3. Statisticians

4. Research staff (nurses, coordinators, Data Managers)

HOW ARE CLINICAL TRIALS MONITORED?

▶ Institutional Review Boards (IRB): A group of experts from the institution conducting the trial or representing a cooperative group of institutions who review each trial for patient safety and scientific merit. The IRB will continue to monitor the conduct of the trial until it is completed along with the Primary Investigator and the research team.

▶ Data and Safety Monitoring Boards: An independent committee of physicians, researchers, statisticians, and other experts.

ABOUT THE STUDY

- What is the purpose of the study?
- Why do researchers think the approach may be effective?
- Who will fund the study?
- Who has reviewed and approved the study?
- How are study results and safety of participants being monitored?
- How long will the study last?
- What will my responsibilities be if I take part?
- Who will tell me about the results of the study and how will I be informed?

RISKS AND POSSIBLE BENEFITS

- What are my possible short-term benefits?
- What are my possible long-term benefits?
- What are my short-term risks, and side effects?
- What are my long-term risks?
- What other options are available?
- How do the risks and possible benefits of this trial compare with those options?

https://www.nih.gov/health-information/nih-clinical-research-trials-you/basics

PERSONAL

- What kinds of therapies, procedures and/or tests will I have during the trial?
- Will they hurt, and if so, for how long?
- How do the tests in the study compare with those I would have outside of the trial?
- Will I be able to take my regular medications while taking part in the clinical trial?
- Where will I have my medical care?
- Who will be in charge of my care?
- How could being in this study affect my daily life?
- Can I talk to other people in the study?

COST ISSUES

- Will I have to pay for any part of the trial such as tests or the study drug?
- If so, what will the charges likely be?
- What is my health insurance likely to cover?
- Who can help answer any questions from my insurance company or health plan?
- Will there be any travel or child care costs that I need to consider while I am in the trial?

PROBLEMS WITH CLINICAL TRIALS

- ► Currently 96 million have been infected with SARS-CoV2
- ▶ Only 4% have been enrolled in randomized clinical trials
- ► Similar to cancer trials 5-9% enrollment
- ► This results in
 - Underrepresented communities (African Americans, rural, and underserved cancer patients)
 - Missed opportunities of (Scientific knowledge and Therapeutic strategies)
- Non-systematic enrolment of people in less powerful types of studies expose thousands of patients to the potential risks of untested interventions with no reliable way of drawing conclusions about efficacy and safety.
 - Off-label use of medications
 - Hydroxychloroquine
 - Statins
 - Tocilizumab
 - ...



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North, C. M., Dougan, M. L. & Sacks, C. A. Improving Clinical Trial Enrollment — In the Covid-19 Era and Beyond. *N. Engl. J. Med.* **383,** 1406–1408 (2020).

Baquet, C. R., Henderson, K., Commiskey, P. & Morrow, J. N. Clinical Trials: The Art of Enrollment. *Semin. Oncol. Nurs.* **24**, 262–269 (2008)



TABLE 1.Selected Examples of Factors that Impede Participation in Clinical Trials

Barriers to Clinical Trial Participation	Examples
Patient factors or demographics	Minority
	Aging and rural
	Poor access to care
	Low socioeconomic status
Patient/community awareness,	Mistrust of research/medical system
trust issues and history	Fear of negative results/effects
	Historical factors
	Lack of information on available trials
Physician and researcher barriers	Reluctance to refer patients (fear of losing patient)
	Lack of awareness/knowledge of clinical trials benefits
	Doctor-patient communications
	Lack of culturally appropriate researcher training to address patient concerns
Infrastructure, design issues	Lack of sufficient number of appropriate clinical trials
	Disqualification of patients due to eligibility criteria
	Lack of sufficient infrastructure to support trials in community settings
Perceived or actual cost barriers	Patients may be reluctant to participate due to lack of insurance or fears of additional costs
	Physicians may be reluctant to refer patients due to real and perceived additional costs
	Oncologists concern: lack of reimbursement for clinical and research costs

From: Baquet CR. The Role of State Legislation and Policy in Addressing Disparities in Clinical Trials. Eliminating Disparities in Clinical Trials (EDICT). http://www.bcm.edu/edict/PDF/State_Legislation.pdf. 12



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▶ 86% of clinical trials do not reach their recruitment targets, and approximately 20% close early because of recruitment failure, with important scientific, ethical, financial, and policy implications

- Even large centres have low recruitment
 - 23% of patients with MDS enrolled in interventional trials at any point in their disease course.
 - narrow eligibility criteria





Brierley, C. K., Zabor, E. C., Komrokji, R. S., DeZern, A. E., Roboz, G. J., Brunner, A. M., et al. Low participation rates and disparities in participation in interventional clinical trials for myelodysplastic syndromes. *Cancer* **126**, 4735–4743 (2020).

WHAT DOES THE CLINICAL TRIAL LANDSCAPE LOOK LIKE?



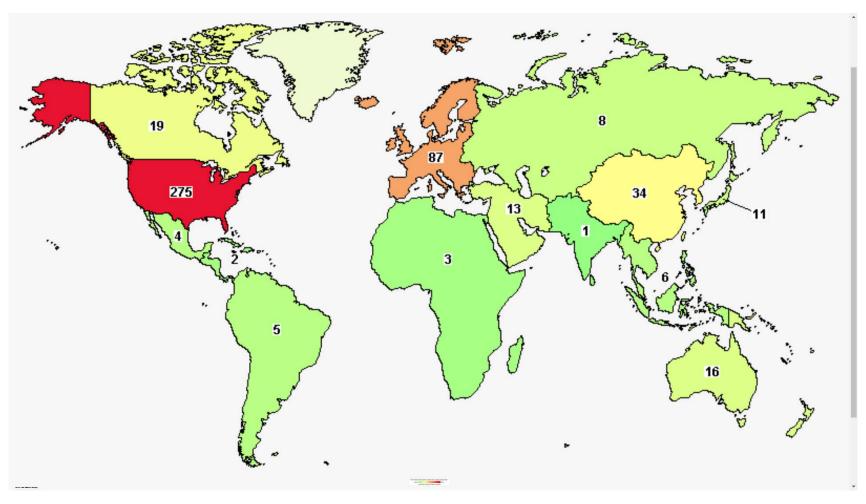
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DISTRIBUTION OF CLINICAL TRIALS FOR MYELODYSPLASTIC SYNDROME AROUND THE WORLD





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HOW DO I FIND THE ONE THAT IS **RIGHT FOR ME?**

- 1. TALK TO YOUR DOCTOR
- 2. UNDERSTAND YOUR DISEASE



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CLASSIFICATION OF MYELODYSPLASTIC SYNDROMES

WORLD HEALTH ORGANIZATION CLASSIFICATION OF MYELODYSPLASTIC SYNDROMES

Name	Dysplastic lineages	Cytopenias*	Ring sideroblasts as % of marrow erythroid elements	BM and PB blasts	Cytogenetics by conventional karyotype analysis
MDS with single lineage dysplasia	1	1 or 2	<15%/ <5% [†]	BM <5%, PB <1%, no Auer rods	Any, unless fulfills all criteria for MDS with isolated del(5q)
MDS with multilineage dysplasia	2 or 3	1-3	<15%/ <5%†	BM <5%, PB <1%, no Auer rods	Any, unless fulfills all criteria for MDS with isolated del(5q)
MDS with ring sideroblasts (MDS-RS)					
MDS-RS with single lineage dysplasia	n 1	1 or 2	≥15%/≥5% [†]	BM <5%, PB <1%, no Auer rods	Any, unless fulfills all criteria for MDS with isolated del(5q)
MDS-RS with multilineage dysplasia	2 or 3	1-3	≥15%/≥5% [†]	BM <5%, PB <1%, no Auer rods	Any, unless fulfills all criteria for MDS with isolated del(5q)
MDS with isolated del(5q)	1-3	1-2	None or any	BM <5%, PB <1%, no Auer rods	del(5q) alone or with 1 additional abnormality except -7 or del(7q)
MDS with excess blasts (MDS-EB)					
MDS-EB-1	0-3	1-3	None or any	BM 5%-9% or PB 2%-4%, no Auer rods	Any
MDS-EB-2	0-3	1-3	None or any	BM 10%-19% or PB 5%-19% or Auer rods	Any
MDS, unclassifiable (MDS-U)					
MDS-U with 1% blood blasts	1-3	1-3	None or any	BM <5%, PB 1%,* no Auer rods	Any
MDS-U with single lineage dysplasia and pancytopenia	1	3	None or any	BM <5%, PB <1%, no Auer rods	Any
MDS-U based on defining cytogeneti	c abnormality	0	1-3	≥15% [§]	BM <5%, PB <1%, no Auer rods MDS-defining abnormality
Refractory cytopenia of childhood	1-3	1-3	None	BM <5%, PB <2%	Any

CLINICAL TRIALS IN MYELODYSPLSIAS

How are they grouped or divided?

- ► Research questions being studied
 - Treatment by RISK group
 - LOW
 - Untreated
 - After failed treatment
 - HIGH
 - Initial treatment
 - Relapsed
 - Targeted therapy
 - Iron overload

INTERNATIONAL PROGNOSTIC SCORING SYSTEM

Prognostic variable	0	0.5	1.0	1.5	2.0
Bone marrow blasts	<5%	5%-10%		11%-20%	21%-30%
Karyotype*	Good	Intermediate	Poor		
Cytopenias [†]	0/1	2/3			

*Good = normal, -Y, del 5q, del 20q; Intermediate = other karyotypic abnormalities; Poor = complex (\geq 3 abnormalities) or chromosome 7 abnormalities †Hemoglobin <10 g/dL;ANC <1800/ μ L; platelets <100,000/ μ L





INTERNATIONAL PROGNOSTIC SCORING SYSTEM

IPSS Score	Risk grouping
0	Low risk
0.5 - 1.0	Intermediate-1 Risk
1.5 – 2.0	Intermediate-2 Risk
≥ 2.5	High risk



TRANSFUSION DEPENDENCE, SURVIVAL AND TRANSFORMATION TO AML BY IPSS SCORE

Parameter	Low	Int-1	Int-2	High
Score	0	0.5-1.0	1.5-2.0	≥2.5
Transfusion dependence	39%	50%	63%	79%
Median AML transformation, Years	9.4	3.3	1.1	0.2
Median survival, Years	5.7	3.5	1.2	0.4



CLINICAL TRIALS IN MYELODYSPLSIAS

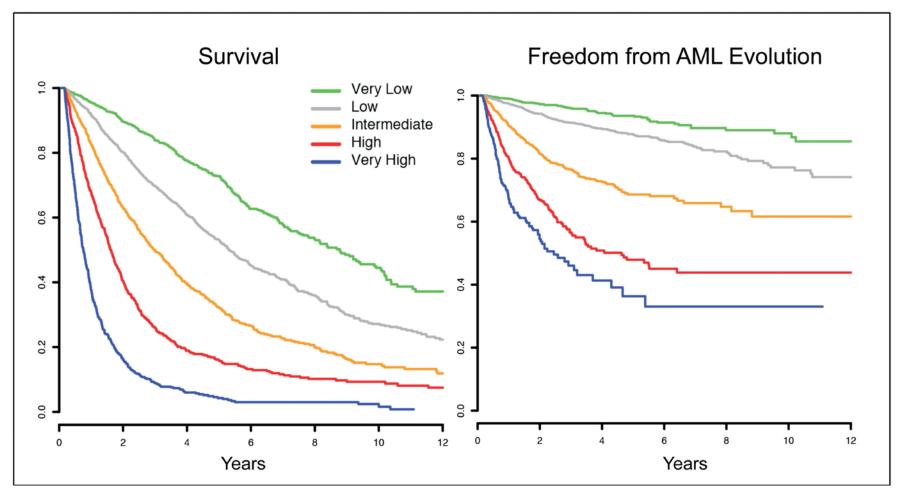
Risk Group

REVISED INTERNATIONAL PROGNOSTIC SCORING SYSTEM

et		Score values						
Characteristics	0	0.5	1	1.5	2	3	4	
Cytogenetics	Very good		Good	-	Intermediate	Poor	Very poor	
Blasts BM, %	≤2	(5)	>2 - <5		5-10	>10	1.70	
нь	≥10	745	8-<10	<8		240	128	
Platelets	≥100	50-<100	<50	*	*		-	
Neutrophils	≥0.8	<0.8	8	ě	2	- 1	850	

Risk groups				
Very low	≤1.5			
Low	>1.5 – 3			
Intermediate	>3 - 4.5			
High	>4.5 - 6			
Very high	>6			

REVISED INTERNATIONAL PROGNOSTIC SCORING SYSTEM





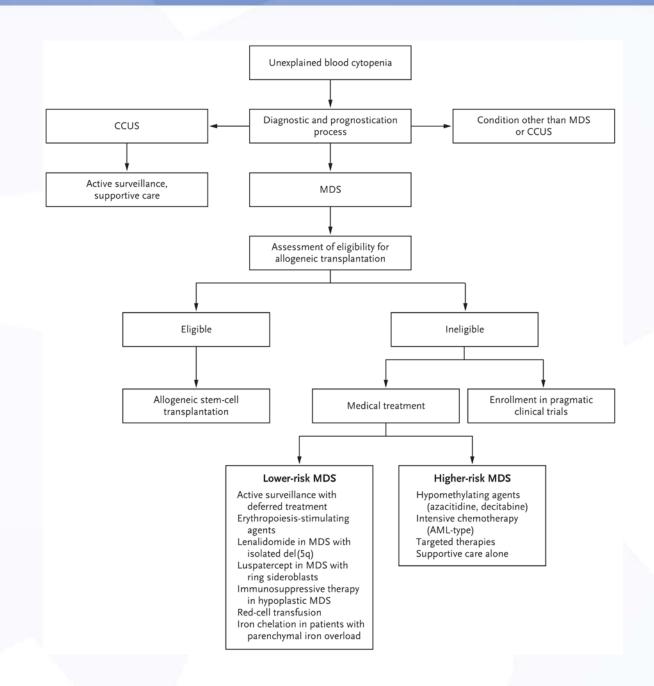
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Hellström-Lindberg, E., Tobiasson, M. & Greenberg, P. Myelodysplastic syndromes: Moving towards personalized management. *Haematologica* **105**, 1765–1779 (2020).



APPROACH TO THE TREATMENT OF MDS

Cazzola, M. Myelodysplastic Syndromes. *N. Engl. J. Med.* **383**, 1358–1374 (2020)



WHERE TO FIND A CLINICAL TRIAL?



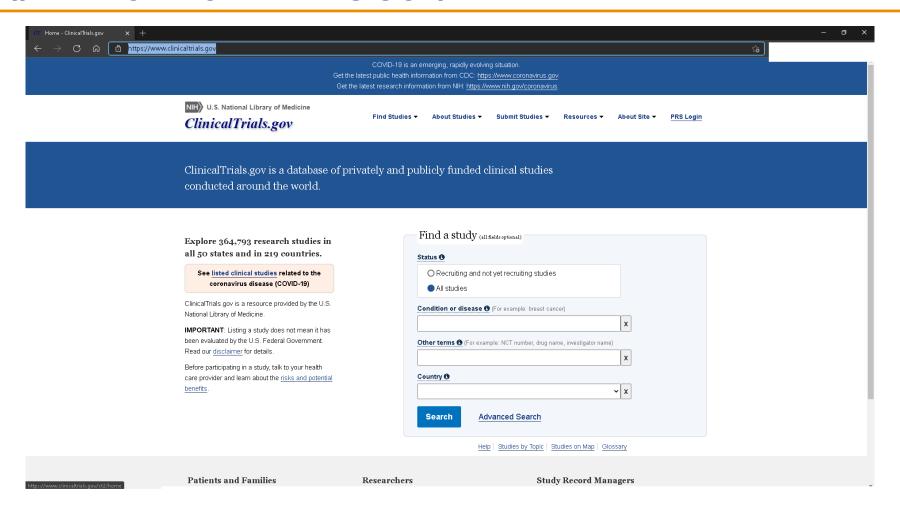
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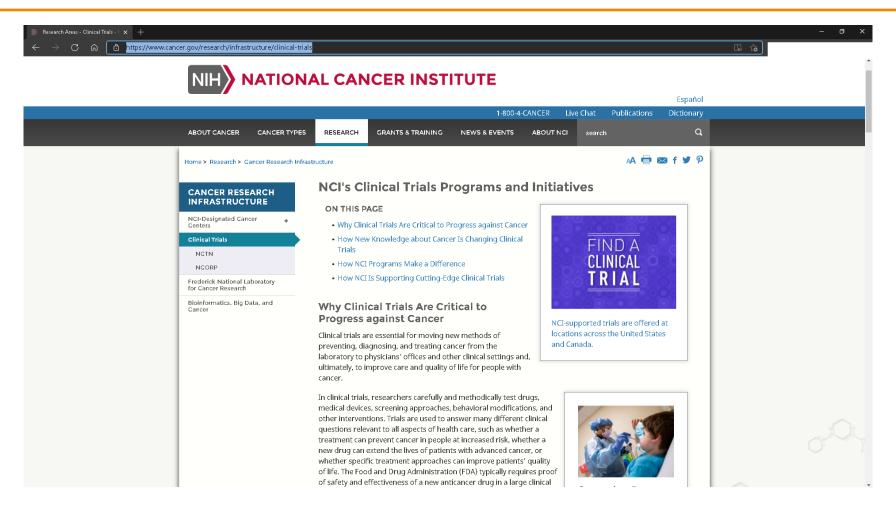
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HTTPS://WWW.CANCER.GOV/RESEARCH/INFRASTRUCTURE/CLINICAL-TRIALS





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HTTPS://WWW.CANADA.CA/EN/HEALTH-CANADA/SERVICES/DRUGS-HEALTH-PRODUCTS/DRUG-PRODUCTS/HEALTH-CANADA-CLINICAL-TRIALS-DATABASE.HTML

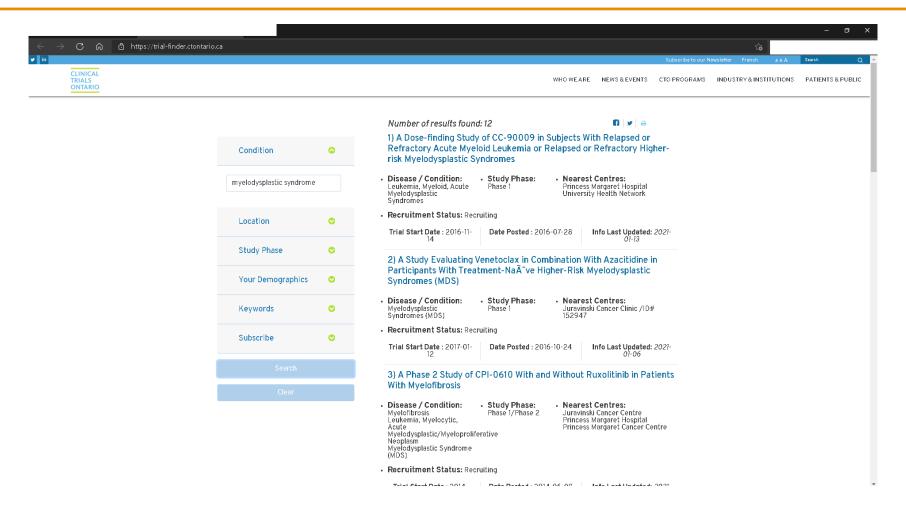




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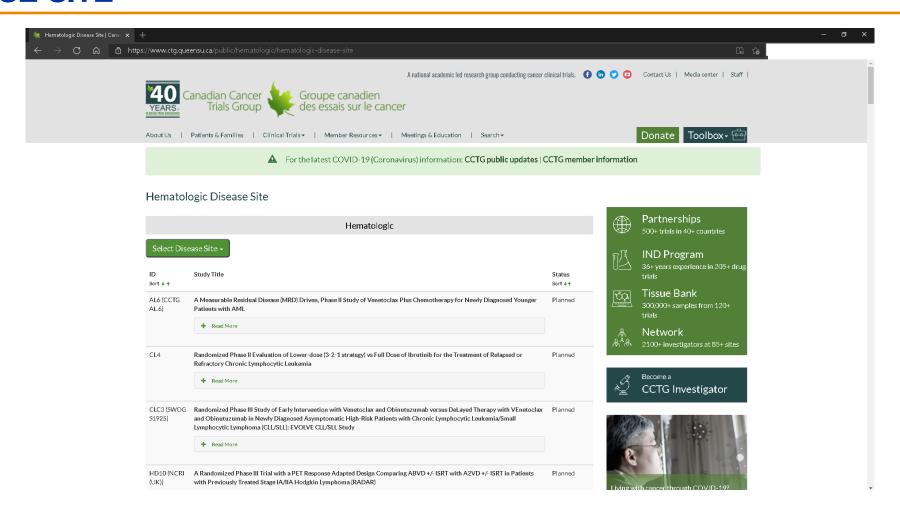








HTTPS://WWW.CTG.QUEENSU.CA/PUBLIC/HEMATOLOGIC/HEMATOLOGIC-**DISEASE-SITE**

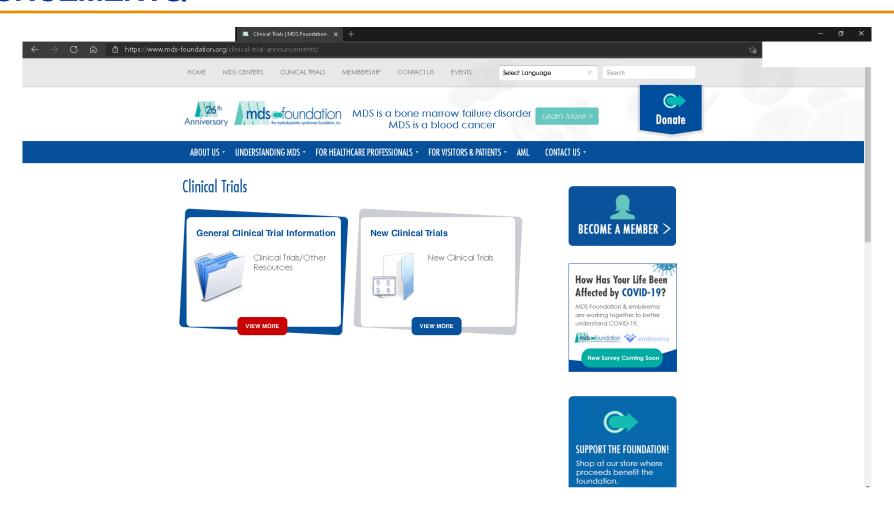




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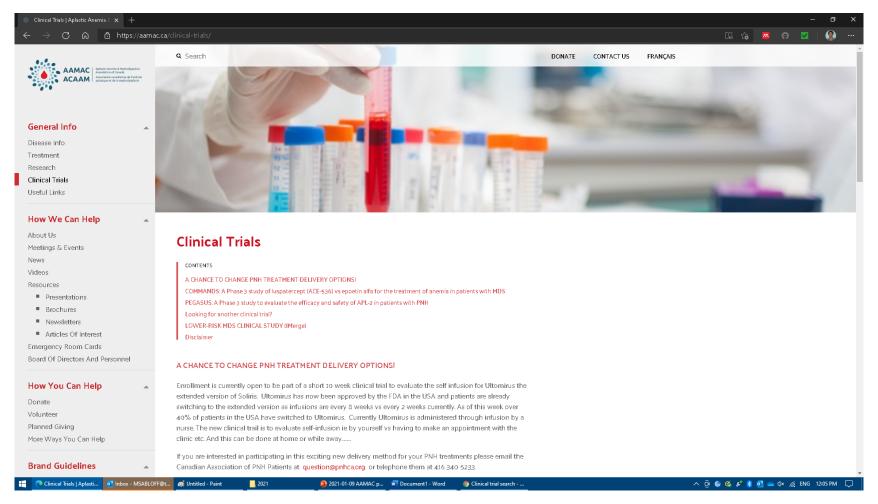
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HTTPS://AAMAC.CA/CLINICAL-TRIALS/





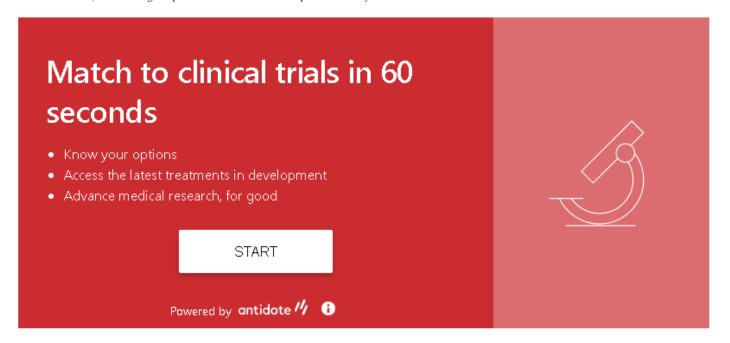
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Looking for another clinical trial?

AAMAC works with partners to provide ways to participate in clinical trials near you. There are several ways to find clinical trials, including a quick search function provided by Antidote.



Antidote delivers clear, unbiased information about clinical trial options. They aim to match patients to the best trial, regardless of the sponsor. Find their privacy policy here.



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LOCAL TRIALS - OTTAWA

- Lower risk
 - COMMANDS
 - Luspatercept (Ace-536) Versus Epoetin Alfa For The Treatment Of Anemia Due To Ipss-r Very Low, Low Or Intermediate Risk Myelodysplastic Syndromes (Mds) In Esa Naïve Subject Who Require Red Blood Cell Transfusions
 - IMERGE
 - Imetelstat (GRN163L) in Transfusion-Dependent Subjects with IPSS Low or Intermediate-1 Risk MDS that is Relapsed/Refractory to erythropoietic stimulating agent Treatment
- Higher risk
- Canadian Myelodysplastic Syndromes Priority Setting Partnership





LOCAL TRIALS - TORONTO [HTTPS://PM.CTRIALFINDER.COM/LIST-VIEW]

- ▶ A phase I/II study to investigate the safety and clinical activity of GSK3326595 and other agents in subjects with myelodysplastic syndrome and acute myeloid leukaemia
- ▶ A phase 3b open-label, single arm, rollover study to evaluate long-term safety in subjects who have participated in other luspatercept (ACE-536) clinical trials (NCT04064060)
- ▶ An open-label, dose escalation, safety and pharmacokinetic study of CFI-400945 fumarate administered orally in patients with relapsed or refractory acute myeloid leukemia (AML) or myelodysplastic syndrome (MDS)
- Phase Ib/II study of IDH2 inhibitor enasidenib in combination with BCL2 inhibitor venetoclax in patients with IDH2-mutated myeloid malignancies
- ▶ A phase 1/2, multicenter, open-label study of FT-2102 as a single agent and in combination with azacitidine in patients with acute myeloid leukemia or myelodysplastic syndrome with an IDH1 mutation





OTHER TRIALS

- Safety And Efficacy Study Of Venetoclax Tablet With Intravenous or Subcutaneous Azacitidine to Assess Change in Complete Remission and Overall Survival In Adult Participants With Newly Diagnosed Higher-Risk Myelodysplastic Syndrome
- ► A Phase III Study Evaluating The Efficacy And Safety Of Crovalimab Versus Eculizumab In Participants With Paroxysmal Nocturnal Hemoglobinuria (PNH) Not Previously Treated With Complement Inhibitors.
- Magrolimab + Azacitidine Versus Azacitidine + Placebo in Untreated Participants With Myelodysplastic Syndrome (MDS)
- ► Comparing Two Diets in Patients Undergoing HSCT or Remission Induction Chemo for Acute Leukemia and MDS (UF-BMT-LDND-101)
- Study of Efficacy and Safety of MBG453 in Combination With Azacitidine in Subjects With Intermediate, High or Very High Risk Myelodysplastic Syndrome (MDS) as Per IPSS-R, or Chronic Myelomonocytic Leukemia-2 (CMML-2)











