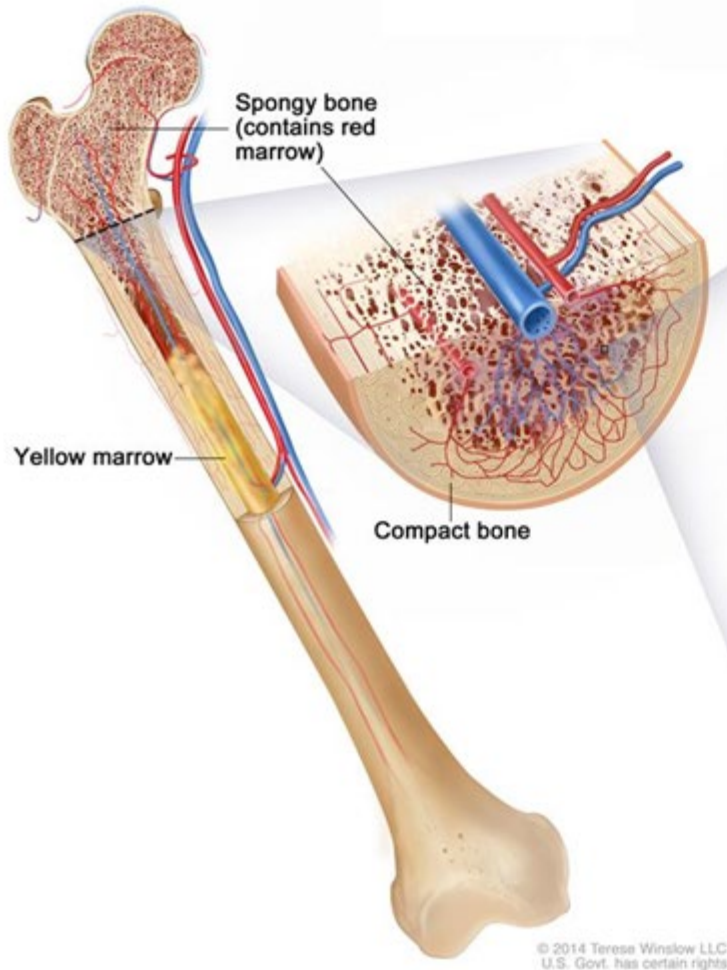# WHAT IS MDS?

Kimo Bachiashvili MD

Division of Hematology and Oncology

O'Neal Comprehensive Cancer Center at the UAB

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

BLOOD AND ITS PRODUCTION

Spongy bone (contains red marrow)

Yellow marrow

Compact bone

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Blood stem cell

Red cells
Carry oxygen

White cells
Fight with infection

Platelets
Help stopping bleeding

NCI

WHAT IS MDS?

DNA damage

Spongy bone (contains red marrow)

Blood stem cell
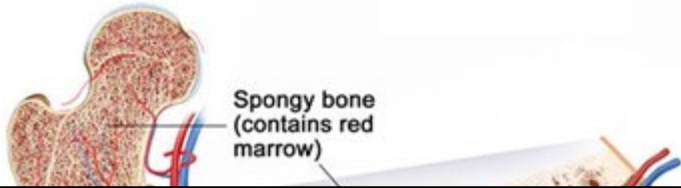
- Most often we don't know what caused mutations
- Sometimes mutations are caused by chemotherapy or other chemicals
- Very rarely people are born with mutations that cause MDS

Red cells
Carry oxygen

White cells
Fight with infection

Platelets
Help stopping bleeding

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LOW BLOOD COUNTS

DNA damage

Blood stem cell

Leukemia

Low Red cells
Carry oxygen

Low White cells
Fight with infection
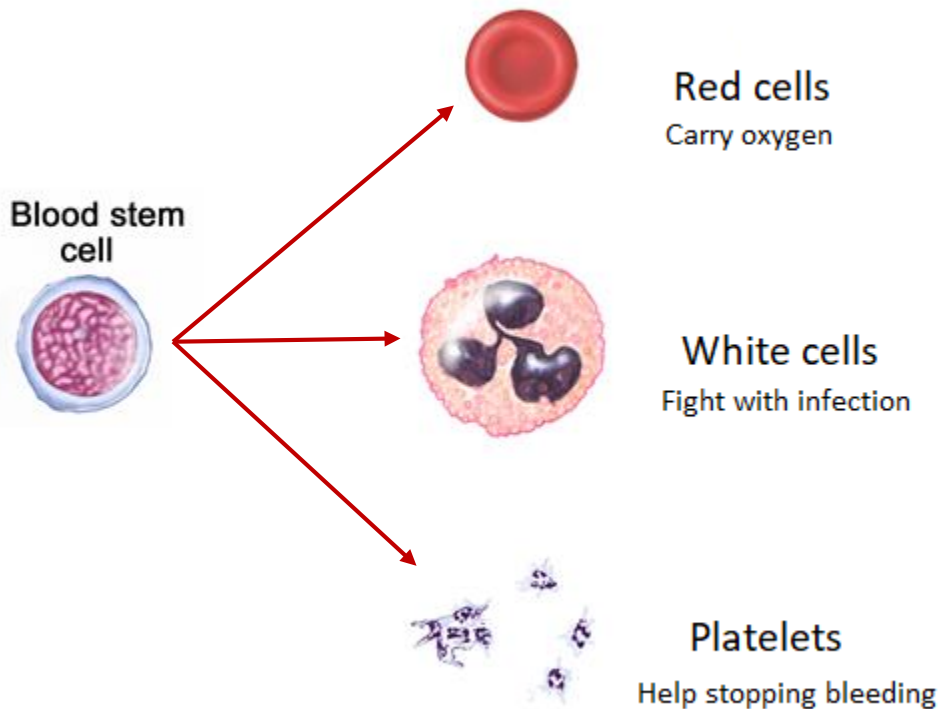
Low Platelets
Help stopping bleeding
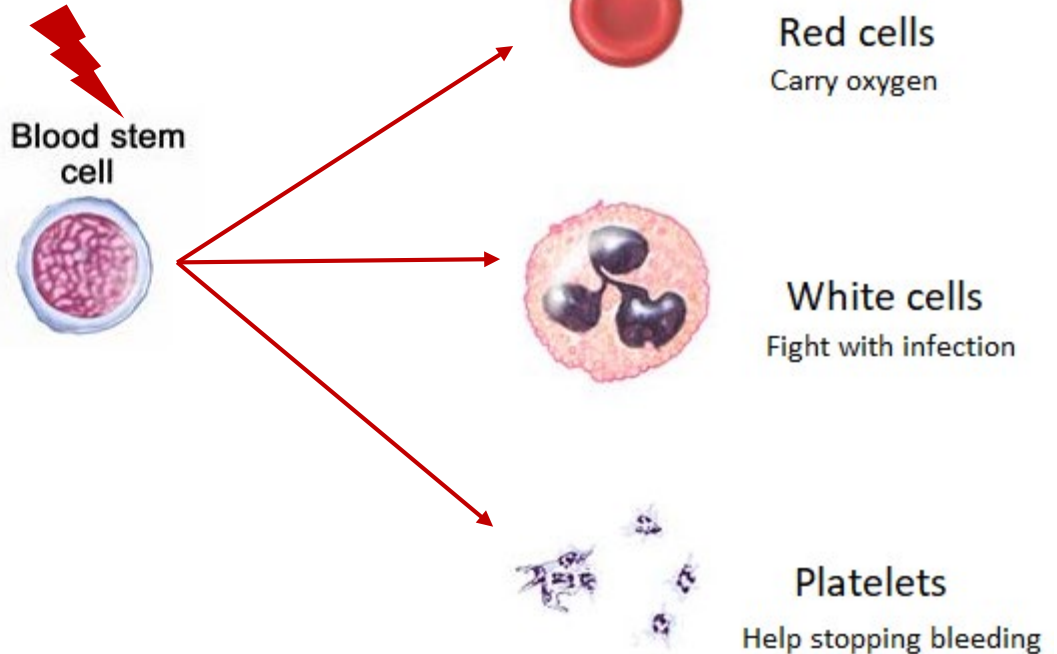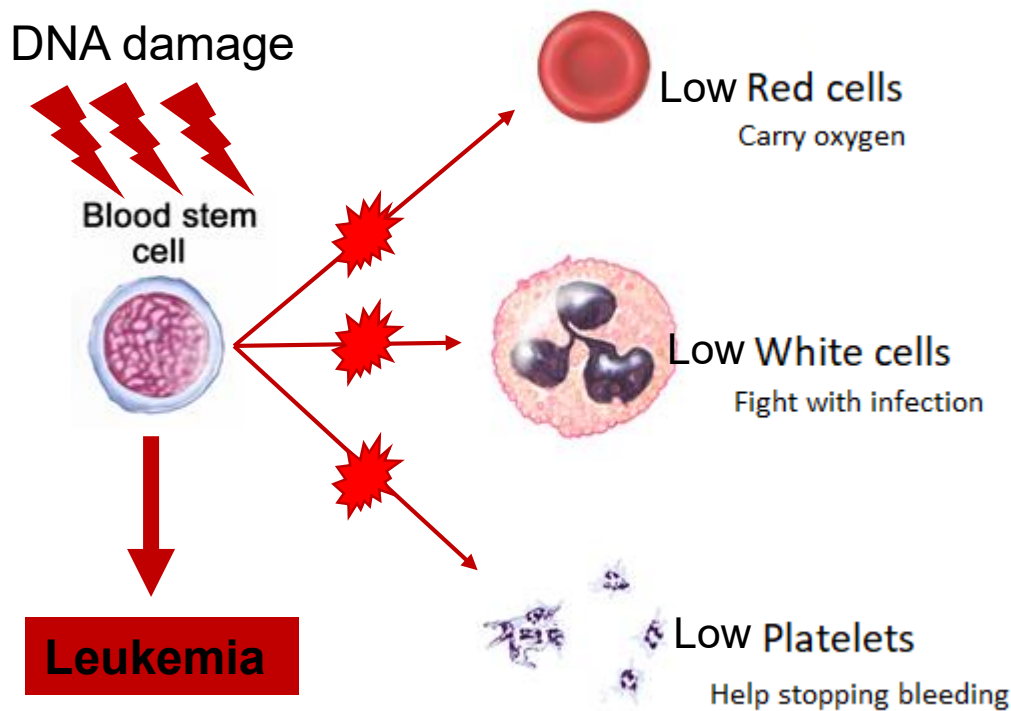
Anemia: Tiredness, dizziness, shortness of breath and chest pain

Neutropenia: predisposition to infections

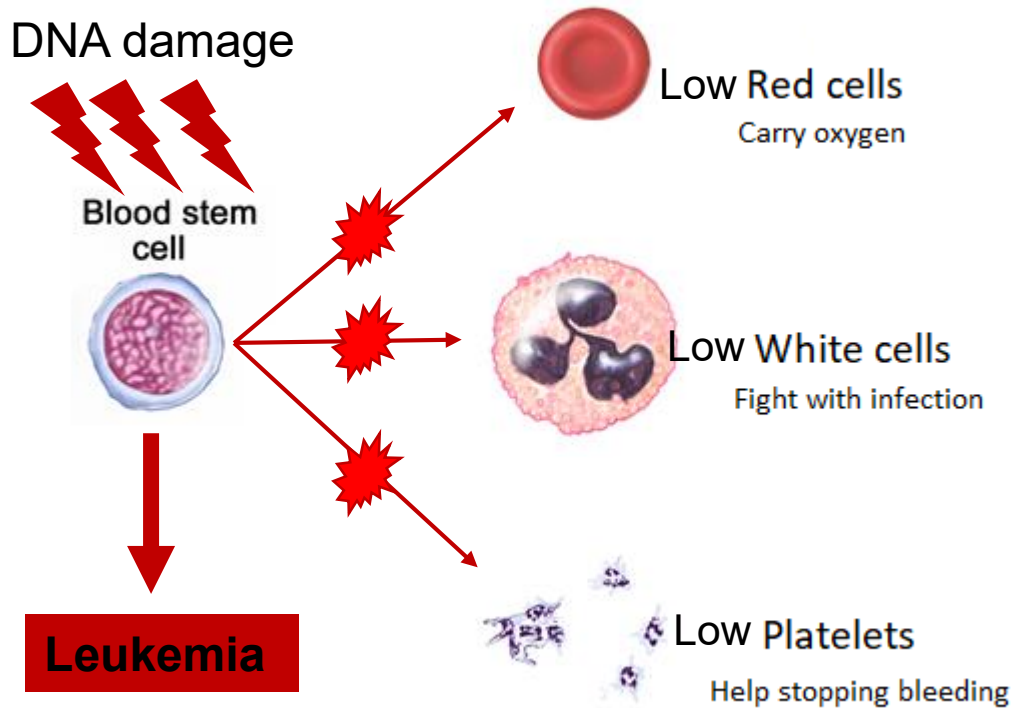Thrombocytopenia: predisposition to easy bruising and bleeding

HOW WE DIAGNOSE MDS

Blood stem cell

Red cells
Carry oxygen

White cells
Fight with infection

Platelets
Help stopping bleeding

- Low blood cell counts
  1. Rule out other causes of low counts
  2. Blood tests and Bone marrow biopsy to look for any of below:
    - Abnormal cells in the marrow
      - dysplastic cells
      - sideroblasts
      - leukemia cells(blasts) <20%
    - Genetic mutations
      - cytogenetics,
      - molecular mutations

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ESTIMATING RISKS

DNA damage

Blood stem cell

Leukemia

Low Red cells
Carry oxygen

Low White cells
Fight with infection

Low Platelets
Help stopping bleeding

- What are the chances of early death due to MDS?
- What are the chances of MDS converting into leukemia?

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ESTIMATING RISK: IPSSR

Variables (units) [usual range]	Value
Hemoglobin (g/dL) [4-20] A possible conversion for Hb values: 10 g/dL= 6.2 mmol/L, 8 g/dL= 5.0 mmol/L	9
Absolute Neutrophil Count ($\times 10^9$/L) [0-15]	0.7
Platelets ($\times 10^9$/L) [0-2000]	60

Blood test

Bone Marrow Blasts (percent) [0-30]	2

Cytogenetic Category

○ **Very Good** ● **Good** ○ **Intermediate** ○ **Poor** ○ **Very Poor**

Bone marrow

IPSS-R SCORE	IPSS-R CATEGORY
3	**low**

> Calculate

https://www.mds-foundation.org/ipss-r-calculator/

Greenberg et al. Blood. 2012 Sep 20; 120(12): 2454–2465

ESTIMATING RISK: IPSSR

	Lower-risk MDS			Higher-risk MDS	
Score	≤1.5 **Very Low**	>1.5–3 **Low**	>3–4.5 **Intermediate**	>4.5–6 **High**	>6 **Very High**
Overall Survival (mean)	8.8 years	5.3 years	3.0 years	1.6 years	0.8 years
Risk of AML in 25% of patients (median)	Not reached	10.8 years	3.2 years	1.4 years	0.73 years

- IPSS-R does not include patients who receive treatments that can extend survival
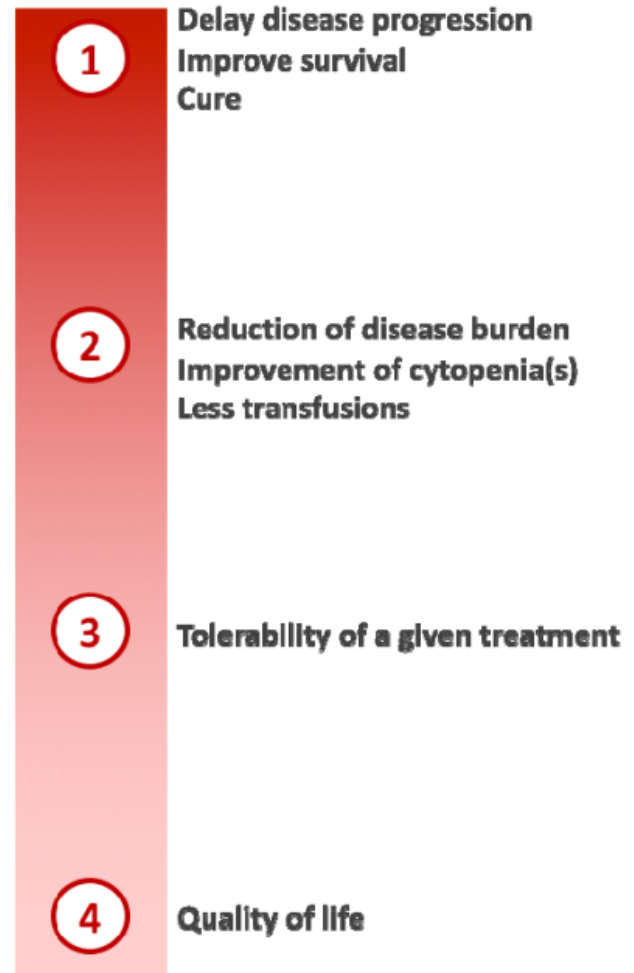- IPSS-R risk is used to guide treatment

https://www.mds-foundation.org/ipss-r-calculator/

PRIORITIES

Priorities in low-risk MDS

1. Improvement of cytopenia(s)
Less transfusions
Less iron overload

2. Tolerability of a given treatment
Quality of life

3. Delay disease progression
Improve survival

4. Cure
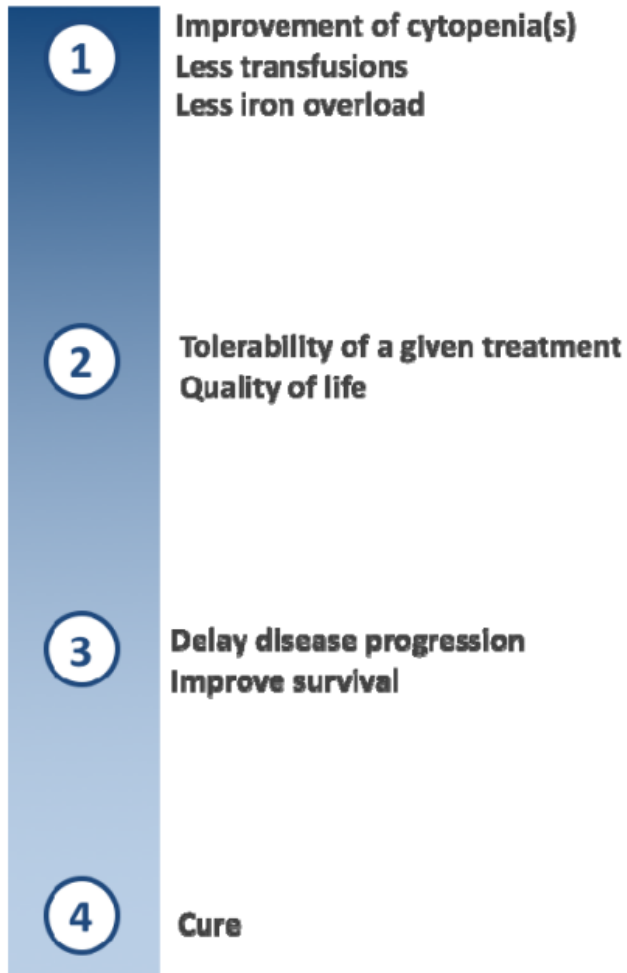
Priorities in high-risk MDS

1. Delay disease progression
Improve survival
Cure

2. Reduction of disease burden
Improvement of cytopenia(s)
Less transfusions

3. Tolerability of a given treatment

4. Quality of life

Uwe Platzbecker. Treatment of MDS. Blood 2019

THANK YOU