

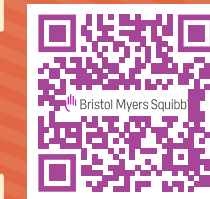
Lower-Risk Myelodysplastic Syndromes: Putting Anemia Under the Spotlight

The publication of this infographic was funded by Bristol Myers Squibb. *Oncol AMJ*. 2024;1[1]:44-45. <https://doi.org/10.33590/oncolamj/WKMQ3310>.

Date: 07/24

Job code: HE-US-2400517

SCAN to visit spotlightonanemia.com



Epidemiology of MDS

MDS occurs predominantly in the aging population



~4.0 per 100,000 Overall age-adjusted incidence rate¹



77 years Median age at diagnosis¹

Unmet needs in MDS



Up to 90% of patients may have anemia, leading to a significantly increased risk of mortality²



Transfusion burden is associated with a short OS³



Transfusion independence is associated with better QoL³

Symptoms of MDS

Typical presenting symptoms of MDS are generally non-specific and usually differ, depending on the type of cytopenia^{4,5}

Most common symptoms of MDS



Anemia⁴

Fatigue/weakness
Shortness of breath
Chest pains
Headache

Palpitations
Pale skin
Loss of appetite
Cold extremities

Other symptoms of MDS



Neutropenia⁴

Frequent infections
Fever
Mouth sores



Thrombocytopenia⁴

Easy bruising
Prolonged bleeding
Petechiae

Diagnostic workup for MDS^{9,10}

Diagnostic workflow

History and physical exam



Clinical suspicion of cytopenia

Peripheral blood count and peripheral blood smear



Clinical suspicion of cytopenia

Screening tests to rule out non-malignant causes

Anemia

Exclude: GI bleeding, cardiac causes, inflammatory causes, and nutritional causes

Neutropenia

Exclude: hypersplenism, autoimmune disorders, medication, toxic exposures



Unexplained cytopenia

Thrombocytopenia

Exclude: ITP, hypersplenism

Specialist referral and additional tests to rule out other non-malignant or malignant causes

- Bone marrow aspiration and biopsy
- Somatic mutation analysis (gene sequencing)
- Cytogenetics (karyotyping, FISH)
- Immunophenotyping (flow cytometry)



MDS

MDS Diagnosis Algorithm

Diagnosis requires a combination of clinical suspicion, laboratory tests, hematologic and morphologic analysis, and cytogenetic and molecular evaluation^{9,11,12}

Minimal prerequisites to establish MDS diagnosis:^{4,11}
≥1 unexplained cytopenia

+
Exclusion of other potential disorders as primary reason for dysplasia/cytopenia

The diagnosis of MDS also requires ≥1 of the following:⁴

- ≥10% morphologic dysplasia (with or without an increase in blast cells) in ≥1 of the 3 lineages of hematopoietic cells
- A blast cell count of 5-19%
- A specific MDS-associated karyotype, such as **del(5q)**, **del(20q)**, **+8**, or **-7/del(7q)**

Burden on Quality of Life Physical Problems



Physical problems
41% of patients with MDS reported moderate or severe mobility issues.⁶ MDS causes a substantial and persistent functional decrement, partially due to fatigue⁷



Role functioning
36.1% of patients with MDS reported moderate or severe problems with usual activities (e.g., work, housework, or leisure activities).⁸ The disease may affect employment, necessitating time off or compromising career opportunities⁸



Emotional problems
37.9% of patients with MDS reported moderate or severe issues with anxiety/depression.⁶ Patients often find the emotional impact of MDS more problematic than the physical consequences.



Social functioning
34% of patients receiving blood transfusions felt they were burdening their family.⁵ Transfusion requirements may disrupt routines and take time away from family and friends⁵

Classification^{9,13-15}

Bone marrow blasts	WHO5	ICC
No dysplasia	CCUS	Clinical suspicion of cytopenia
<5%	MDS, hypoplastic MDS with LB MDS with LB and isolated 5q del MDS with LB and SF381 mutation*	Not included MDS-NOS with SLD, or with MLD MDS with del(5q) MDS with mutated SF387
5-9%	MDS with IB1 MDS with fibrosis	MDS with EB Not included
10-19%	MDS with IB2 MDS with biallelic TP53 inactivation	MDS/AML MDS with mutated TP53 MDS/AML with mutated TP53

Two updated classifications for MDS were developed in 2022: the WHO5 and the ICC for Myeloid Neoplasms and Acute Leukaemia, which are overall similar, but with some differences in diagnostic criteria and nomenclatures.^{9,13}

Risk stratification

The IPSS-R is the most commonly used risk stratification system in MDS, taking into account the degree of cytopenia, proportion of blasts in the bone marrow, and presence of cytogenetic abnormalities.^{5,16,17}

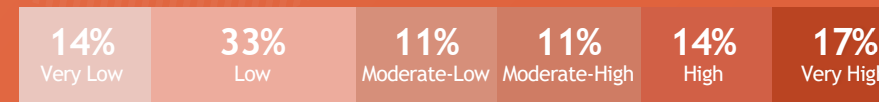
Revised International Prognostic Scoring System (IPSS-R)¹⁶



~77% of patients have LR-MDS³

Recently, the IPSS-M was developed, which integrated information from 31 gene mutations in addition to the IPSS-R components.^{5,17,18}

Molecular International Prognostic Scoring System (IPSS-M)¹⁸



Treatment goals for anemia in LR-MDS⁵



Achieve RBC transfusion independence



Improve hematological status



Improve QoL



Improve OS and delay AML transformation

Abbreviations: AML: acute myeloid leukemia; CCUS: clonal cytopenia of undetermined significance; del: deletion; EB: excess blasts; FISH: fluorescence in situ hybridisation; GI: gastrointestinal; IB: increased blasts; ICC: International Consensus Classification; IPSS-M: Molecular International Prognostic Scoring System; IPSS-R: Revised International Prognostic Scoring System; ITP: idiopathic thrombocytopenic purpura; LB: low blasts; LR: lower-risk; MDS: myelodysplastic syndromes; MLD: multilineage dysplasia; NOS: not otherwise specified; OS: overall survival; QoL: quality of life; RBC: red blood cell; SLD: single-lineage dysplasia; WHO: World Health Organization.

References

- Leukemia & Lymphoma Society. Facts 2022-2023. Updated data on blood cancers. 2023. Available at: <https://www.lls.org/booklet/facts-updated-data-blood-cancers>. Last accessed: 2 May 2024.
- Zeidan AM et al. Epidemiology of myelodysplastic syndromes: why characterizing the beast is a prerequisite to taming it. *Blood Rev*. 2019;34:1-15.
- Braga Lemos M et al. Association between red blood cell transfusion dependence and burden in patients with myelodysplastic syndromes: a systematic literature review and meta-analysis. *Eur J Haematol*. 2021;107(1):3-23.
- National Comprehensive Cancer Network (NCCN). Myelodysplastic syndromes: NCCN guidelines version 2.2024. 2024. Available at: <https://www.nccn.org/guidelines/guidelines-detail?category=1&id=1446>. Last accessed: 2 May 2024.
- Sekeres MA et al. Perceptions of disease state, treatment outcomes, and prognosis among patients with myelodysplastic syndromes: results from an internet-based survey. *Oncologist*. 2011;16(6):904-11.
- Stauder R et al. Health-related quality of life in lower-risk MDS patients compared with age- and sex-matched reference populations: a European LeukemiaNet study. *Leukemia*. 2018;32(6):1380-92.
- Ria R et al. Managing myelodysplastic symptoms in elderly patients. *Clin Interv Aging*. 2009;4:413-23.
- Soper J et al. Patient and caregiver insights into the disease burden of myelodysplastic syndrome. *Patient Relat Outcome Meas*. 2022;13:31-8.
- Hasserjian RP et al. Diagnosis and classification of myelodysplastic syndromes. *Blood*. 2023;142(26):2247-57.
- Foran JM, Shamou JM. Clinical presentation, diagnosis, and prognosis of myelodysplastic syndromes. *Am J Med*. 2012;125(Suppl 7):S6-13.
- Weinberg OK, Hasserjian RP. The current approach to the diagnosis of myelodysplastic syndromes. *Semin Hematol*. 2019;56(1):15-21.
- Barone P, Patel S. Myelodysplastic syndrome: Approach to diagnosis in the era of personalized medicine. *Semin Diagn Pathol*. 2023;40(3):172-81.
- Xu ML, Hasserjian RP. Updates in Classification of Myelodysplastic Syndrome. *Cancer J*. 2023;29:122-9.
- Arber DA et al. International Consensus Classification of myeloid neoplasms and acute leukemias: integrating morphologic, clinical, and genomic data. *Blood*. 2022;140(11):1200-28.
- Khouri JD et al. The 5th edition of the World Health Organization classification of haematolymphoid tumours: myeloid and histiocytic/dendritic neoplasms. *Leukemia*. 2022;36(7):1703-19.
- Greenberg PL et al. Revised international prognostic scoring system for myelodysplastic syndromes. *Blood*. 2012;120(12):2454-65.
- Volpe VO et al. SOHO state of the art updates and next questions: treatment of low risk myelodysplastic syndromes. *Clin Lymphoma Myeloma Leuk*. 2023;23:168-77.
- Bernard E et al. Molecular International Prognostic Scoring System for myelodysplastic syndromes. *NEJM Evid*. 2022;1(7):EVID0220008.
- Germming U et al. Treatment of anemia in transfusion-dependent and non-transfusion-dependent lower-risk MDS: current and emerging strategies. *Hemasphere*. 2019;3(6):e314.

Bristol Myers Squibb

©2024 Bristol-Myers Squibb Company