AAVBC

AMERICAN ACADEMY OF VALUE BASED CARE

Myelodysplastic Syndromes Quick Reference Guide

2026

Table of Contents

1 CLINICAL SNAPSHOT

Definition: Myelodysplastic syndromes (MDS) are a heterogeneous group of clonal hematopoietic stem-cell malignancies in which ineffective hematopoiesis produces one or more persistent peripheral **cytopenias**, morphologic **dysplasia** in the bone marrow, and a variable risk of progression to acute myeloid leukemia (AML).[1] Diagnosis integrates clinical, morphologic, cytogenetic, and molecular data; bone marrow aspirate and biopsy are required to confirm MDS.[1] The **boundary with AML is defined by blast percentage**: MDS carries **<20% blasts**, while **≥20% blasts** defines AML.[1] Because the disease is biologically diverse, the central caution for primary care is to avoid oversimplifying it as a single anemia of aging.

ICD-10 Codes:

MDS is reported under the **D46** category, with subtype-specific codes that should reflect bone marrow and cytogenetic findings: **D46.0** (refractory anemia without ring sideroblasts), **D46.1** (refractory anemia with ring sideroblasts), **D46.20** (RAEB, unspecified), **D46.21** (RAEB-1, blasts 5-9%),[2] **D46.22** (RAEB-2, blasts 10-19%),[2] **D46.4** (refractory anemia, unspecified), **D46.A** (refractory cytopenia with multilineage dysplasia), **D46.B** (multilineage dysplasia with ring sideroblasts), **D46.C** (MDS with isolated del(5q)), **D46.Z** (other MDS), and **D46.9** (MDS, unspecified). When MDS transforms to AML (>=20% blasts),[1] the code must be updated from **D46.x** to the appropriate **C92.x** code. Suspected or probable MDS should be coded to the documented sign or symptom until a marrow-confirmed diagnosis is established.

Prevalence and Burden: MDS is predominantly a disease of older adults - more than **85%** of cases occur in persons 60 years or older, with a median age at diagnosis of roughly **70-77 years**.[4] SEER-based incidence is about **4 per 100,000/year** overall and near **25 per 100,000/year** in adults aged >=65.[5] Claims-based methods place the true incidence in adults ≥65 substantially higher (approximately **75 per 100,000/year**) reflecting significant registry under-documentation.[6] Overall 5-year survival is approximately **37%**; lower-risk MDS carries a median survival of **3-10 years**, while higher-risk MDS carries a median survival of **<3 years**.[5]

HCC/RAF V28 Mapping

ICD-10 CODE(S)	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
D46.0 Refractory anemia without ring sideroblasts	**HCC 19** Myelodysplastic Syndromes/Multiple Myeloma/and Other Cancers	**1.798**	Document WHO-aligned bone marrow findings **(erythroid dysplasia, no ring sideroblasts, <5% blasts, cytogenetics)** and persistent anemia despite adequate nutritional supplementation

ICD-10 CODE(S)	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
D46.1 Refractory anemia with ring sideroblasts	**HCC 19** Myelodysplastic Syndromes/Multiple Myeloma/and Other Cancers	**1.798**	Document bone marrow biopsy (Prussian blue) confirming **≥15% ring sideroblasts and <5% blasts**, along with iron studies, cytogenetics, and SF3B1 mutation status
D46.20 Refractory anemia with excess blasts, type 1	**HCC 19** Myelodysplastic Syndromes/Multiple Myeloma/and Other Cancers	**1.798**	**RAEB-1: blast count 5-9%** on bone marrow biopsy; provider query should be initiated to determine the exact blast percentage for more specific coding; document cytogenetic findings, transfusion requirements, and disease trajectory
D46.21 Refractory anemia with excess blasts, type 2	**HCC 19** Myelodysplastic Syndromes/Multiple Myeloma/and Other Cancers	**1.798**	**RAEB-2: blast count 10-19%**; higher AML risk;document cytogenetic findings, transfusion requirements, and disease trajectory
D46.C MDS with isolated del(5q)	**HCC 19** Myelodysplastic Syndromes/Multiple Myeloma/and Other Cancers	**1.798**	Document isolated del(5q) as the sole cytogenetic abnormality, bone marrow with hypolobated megakaryocytes and <5% blasts, macrocytic anemia with normal/elevated platelets, and lenalidomide response (if applicable) **Critical:** often in pathology but not coded; lenalidomide-eligible
D46.9 MDS, unspecified	**HCC 19** Myelodysplastic Syndromes/Multiple Myeloma/and Other Cancers	**1.798**	Use only when WHO subtype genuinely undeterminable

ICD-10 CODE(S)	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
C92.x — C92.A0 Acute Myeloid Leukemia with multilineage dysplasia/C92.A1 (remission)—update required at progression	**HCC 17** Cancer Metastatic to Lung/ Liver/Brain/and Other Organs; AML Except Promyelocytic	**4.209**	Must switch from **D46.x** when **MDS transforms to AML**; once blast count ≥20%

ABBREVIATIONS: AML = acute myeloid leukemia; CMS = Centers for Medicare & Medicaid Services; CMS-HCC V28 = CMS Hierarchical Condition Category Model, Version 28; CNA = Community Non-Dual Eligible, Aged segment; HCC = Hierarchical Condition Category; ICD-10-CM = International Classification of Diseases, 10th Revision, Clinical Modification; MA = Medicare Advantage; MDS = myelodysplastic syndromes; RAEB = refractory anemia with excess blasts; RAF = Risk Adjustment Factor. *RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

Risk-Adjusted Care Resources per Patient/Year[7,8]

Risk-adjusted care resource allocation — MA base rate (~$10,402.34) × RAF coefficient

Myelodysplastic Syndrome
~$18,703

HCC 19 · RAF 1.798

2 RECOGNITION AND DIAGNOSIS

Medicare Diagnostic Workup and Surveillance (Adult and Geriatric)

SERVICE/SETTING (CPT)	WHAT AND WHEN	COVERAGE	DOCUMENTATION
No MDS-specific screening test[5]	MDS has **no Medicare-covered screening test**; it is typically detected during workup of unexplained cytopenias found incidentally or on symptom evaluation	Diagnostic services are covered when medically necessary, not as screening	**Document the cytopenia(s) prompting evaluation** - lineage, duration, and severity[2]

SERVICE/SETTING (CPT)	WHAT AND WHEN	COVERAGE	DOCUMENTATION
CBC with differential (85025)[2]	First step in evaluating fatigue, recurrent infection, or bleeding; no frequency limit for monitoring active MDS	Covered when medically necessary	**Record absolute counts, the trend over time,and reticulocyte count**
Bone marrow aspirate + biopsy (38220/38221/38222)[2]	Required to confirm MDS; performed with iron stain, cytogenetics (≥20 metaphases), and an NGS somatic mutation pane l	Covered when medically necessary for cytopenia workup	Document dysplasia **≥10% in ≥1 lineage** and the blast percentage[5]
Serum EPO, B12/ folate, ferritin/iron/ TIBC, TSH, LDH (e.g., 82668, 82728)[2]	Drawn before transfusion/ESA; rule out reversible causes (B12, folate, copper deficiency; drug toxicity; infection) before diagnosing MDS	Covered prior to ESA initiation and for iron monitoring	**Document the EPO level** (prior to transfusion) to support ESA selection

ABBREVIATIONS: B12 = vitamin B12; CBC = complete blood count; EPO = erythropoietin; ESA = erythropoiesis-stimulating agent; LDH = lactate dehydrogenase; MDS = myelodysplastic syndromes; NGS = next-generation sequencing; TIBC = total iron-binding capacity; TSH = thyroid-stimulating hormone

Subtle Signs in Older Adults

SUBTLE SIGN	WHY IT IS MISSED IN OLDER ADULTS	ACTION
Persistent unexplained anemia[5]	Often attributed to anemia of aging or chronic disease; a slow, isolated macrocytic or normocytic anemia is the most common MDS presentation	**Recheck CBC**; if cytopenia persists **≥2-4 months** without explanation, refer for marrow evaluation[2]
New or worsening fatigue and reduced exercise tolerance[5]	Easily ascribed to deconditioning, cardiac disease, or depression in geriatric patients	**Correlate symptoms with the hemoglobin trend** rather than dismissing them as deconditioning[9]
Recurrent or severe infections	Neutropenia **(ANC <800/mcL in ~18% at diagnosis)** may be overlooked when the white count is only mildly low[5]	**Review the differential for neutropenia**; consider MDS in recurrent infection with cytopenia

SUBTLE SIGN	WHY IT IS MISSED IN OLDER ADULTS	ACTION
Easy bruising, petechiae, or mucosal bleeding[5,10]	Thrombocytopenia may be mild early and attributed to medication effect	**Quantify the platelet trend**; persistent thrombocytopenia warrants hematology input
Macrocytosis without B12/ folate deficiency[11]	An elevated MCV is frequently noted but not pursued once B12 and folate are normal	**Unexplained macrocytosis with cytopenia should prompt MDS consideration**; pursue marrow workup

ABBREVIATIONS: ANC = absolute neutrophil count; B12 = vitamin B12; CBC = complete blood count; MCV = mean corpuscular volume; MDS = myelodysplastic syndromes; mcL = microliter

Geriatric Risk Factors

RISK FACTOR	RISK SIGNAL	NOTES
Age ≥65 years	Incidence rises from ~4/100,000 overall to **~25/100,000** at age ≥65, and as high as **~75/100,000** by claims-based methods in adults >70[5,12]	Screen for unexplained cytopenias on routine geriatric labs; avoid attributing low counts to "anemia of aging" without workup
Male sex	Higher incidence (~**5.4 vs 2.9 per 100,000**, male vs female) and higher age-adjusted mortality (AAMR **33.01 vs 15.38**)[5,13]	Informs risk stratification rather than surveillance frequency; no sex-specific screening change indicated
Prior chemotherapy or radiation	Alkylating agents, topoisomerase II inhibitors, and radiation are established causes of therapy-related MDS[5]	Maintain long-term CBC surveillance in cancer survivors
Family history of MDS	~15% cases linked to genetic predisposition[12]	Consider hereditary myeloid malignancy referral when multiple affected relatives or unusually young age at onset
Occupational and environmental exposure	Chemical and petroleum exposure (auto industry, dry cleaners, painters, farmers); pesticide exposure[1,5]	Ask about occupational history at intake; benzene and pesticide exposure are most consistently implicated
Smoking	Increased risk compared to non-smokers	Counsel on cessation regardless of MDS risk status

RISK FACTOR	RISK SIGNAL	NOTES
Clonal hematopoiesis (CHIP/CCUS)	Precursor states; progression to MDS/AML is **~0.5-1% per year** in CHIP[21] and higher in CCUS; myeloid-neoplasm risk rises **3-, 37-, and 348-fold** across low-, intermediate-, and high-risk CHIP/CCUS[2,14]	Often an incidental finding on next-generation sequencing; warrants hematology monitoring even without cytopenias
Frailty (hospitalized MDS patients)	Independent predictor of mortality (OR **1.80**, 95% CI 1.22-2.64) and sepsis (OR **2.02**, 95% CI 1.33-3.06); present in ~**25%** of hospitalized MDS patients[15]	Build frailty screening into the hospital admission workflow, not just outpatient visits
Functional and nutritional deficits	ADL impairment (HR **2.20**, 95% CI 1.11-4.34) and malnutrition risk (HR **2.00**, 95% CI 1.07-3.73) independently predict death beyond ECOG status[16,17]	Formal geriatric assessment adds prognostic value beyond performance status alone

ABBREVIATIONS: AAMR = age-adjusted mortality rate; ADL = activities of daily living; AML = acute myeloid leukemia; CCUS = clonal cytopenia of undetermined significance; CHIP = clonal hematopoiesis of indeterminate potential; CI = confidence interval; ECOG = Eastern Cooperative Oncology Group; HR = hazard ratio; MDS = myelodysplastic syndromes; OR = odds ratio

Diagnostic Thresholds (WHO/ICC 2022, IPSS-R, IPSS-M)

CRITERION/SYSTEM	DEFINITION	CLINICAL USE
WHO 5th Edition/ICC 2022[2,18]	Diagnostic classification requiring persistent cytopenia, **morphologic dysplasia ≥10% in ≥1 lineage, and blasts <20%**; defines genetic entities (del(5q), SF3B1-mutant, biallelic TP53)	Establishes the MDS diagnosis and subtype; **WHO calls 10-19% blasts MDS-IB2**, ICC calls it MDS/AML
IPSS-R (Revised IPSS)[2,19,20]	Integrates cytogenetics, marrow blast %, hemoglobin, platelets, and ANC; score 0-10 across 5 risk categories; OS concordance **0.74**	Current standard for risk stratification; cutoff **≤3.5 = lower-risk**, **>3.5 = higher-risk** guides therapy
IPSS-M (Molecular)[2,20]	Adds somatic mutation data to the IPSS-R framework (≥15 genes); 6 risk categories; OS concordance **0.81**; reclassifies ~**46%** of patients vs IPSS-R	**Newest system**; NCCN notes a possible role pending confirmatory evidence

CRITERION/SYSTEM	DEFINITION	CLINICAL USE
IPSS (original)/WPSS[2,20]	IPSS uses blast %, karyotype, and cytopenia count (4 categories); WPSS adds WHO category and transfusion need, permitting dynamic re-estimation	**IPSS still used for trial eligibility**; WPSS allows prognosis updates over time

ABBREVIATIONS: ANC = absolute neutrophil count; ICC = International Consensus Classification; IPSS = International Prognostic Scoring System; IPSS-M = Molecular IPSS; IPSS-R = Revised IPSS; MDS = myelodysplastic syndromes; MDS-IB2 = MDS with increased blasts-2; OS = overall survival; WHO = World Health Organization; WPSS = WHO-based Prognostic Scoring System

Clues to Dig Deeper

CLUE	WHAT IT SUGGESTS	NEXT STEP
Macrocytic anemia with normal B12/folate[5]	Possible ineffective erythropoiesis of MDS rather than a nutritional cause	**Persisting ≥2-4 months -> hematology referral** for marrow evaluation[2]
Cytopenia in ≥2 lineages (bi-/pancytopenia)[5]	Multilineage involvement raises concern for higher-risk MDS	**Urgent hematology evaluation**; expedite marrow biopsy
Circulating blasts or immature cells on smear[10]	Disease progression or AML transformation	**Same-day or next-day hematology** contact
Isolated del(5q) on cytogenetics[2,9]	Distinct, prognostically favorable subtype (lenalidomide-responsive)	Ensure **D46.C** is documented and coded; this finding is often omitted
Rising blast percentage on serial marrows[21]	Progression (e.g., RAEB-1 -> RAEB-2 -> AML)	**Reassess the risk score** and update the ICD-10 subcode accordingly

ABBREVIATIONS: AML = acute myeloid leukemia; B12 = vitamin B12; del(5q) = deletion of chromosome 5q; MDS = myelodysplastic syndromes; RAEB = refractory anemia with excess blasts

Common Oversights

COMMON OVERSIGHT	WHY IT MATTERS	BETTER PRACTICE
Attributing persistent cytopenia to normal aging[22]	Delays diagnosis of a treatable, potentially progressive malignancy	**Pursue unexplained, persistent cytopenia** with hematology referral rather than observation alone

COMMON OVERSIGHT	WHY IT MATTERS	BETTER PRACTICE
Stopping the workup once B12 and folate are normal[5]	Misses MDS as the cause of macrocytic anemia	**Consider MDS when macrocytosis or cytopenia persists** despite normal nutritional studies; pursue **marrow evaluation**
Overlooking mild neutropenia in recurrent infection[5]	**Neutropenia (ANC <800/mcL)** is present in **~18%** at diagnosis and elevates infection risk	**Examine the full differential**; pair recurrent infection plus cytopenia with MDS in the differential
Not screening for frailty and functional decline[15]	Frailty independently predicts mortality **(OR 1.80)** and is often a stronger outcome predictor than IPSS-R alone	**Perform a validated geriatric/frailty assessment** (e.g., G-8, Fried criteria) at diagnosis and before treatment decisions
Missing iron overload in transfusion-dependent patients[23]	Cardiac iron deposition occurs in **~16%** of chronically transfused patients, and high TSAT predicts inferior survival	Monitor ferritin; assess for chelation after **>20-30 RBC** transfusions
Not recognizing AML transformation early[5]	A rising blast count or new circulating blasts signals transformation requiring prompt escalation	**Track serial blast counts**; act on new peripheral blasts or rapidly worsening cytopenias

ABBREVIATIONS: AML = acute myeloid leukemia; ANC = absolute neutrophil count; B12 = vitamin B12; IPSS-R = Revised International Prognostic Scoring System; MDS = myelodysplastic syndromes; OR = odds ratio; RBC = red blood cell; TSAT = transferrin saturation

Key Differentials in Elderly

DIFFERENTIAL	DISTINGUISHING FEATURES	HOW TO CONFIRM/ EXCLUDE
Nutritional deficiency (B12, folate, copper)[2,11]	Reversible macrocytic anemia; dysplasia can mimic MDS but resolves with repletion	**Check B12, folate, and copper**; recheck counts after repletion before diagnosing MDS

DIFFERENTIAL	DISTINGUISHING FEATURES	HOW TO CONFIRM/ EXCLUDE
Drug- or toxin-induced cytopenia[24]	Recent chemotherapy, **methotrexate**, or other marrow-suppressing agents (e.g., **azathioprine, linezolid, trimethoprim-sulfamethoxazole, colchicine**); also consider chronic alcohol use	**Review medications and exposures**; reassess after the offending agent is addressed
Anemia of chronic disease/ renal disease[5]	Usually normocytic; tied to inflammation or low erythropoietin	**Evaluate inflammatory markers, renal function, and the EPO level**
Clonal hematopoiesis (CHIP/ CCUS)[2]	Somatic mutations without (CHIP) or with cytopenia but no diagnostic dysplasia (CCUS)	**Marrow morphology distinguishes precursor states** from diagnostic MDS correlate with molecular testing
Aplastic anemia/other marrow failure[5]	Hypocellular marrow without diagnostic dysplasia	**Marrow biopsy with cytogenetics differentiates**; overlap exists with hypoplastic MDS
Acute myeloid leukemia[2]	Defined by ≥20% blasts (or AML-defining genetics)	Blast count on marrow; **≥20% reclassifies as AML**

ABBREVIATIONS: AML = acute myeloid leukemia; B12 = vitamin B12; CCUS = clonal cytopenia of undetermined significance; CHIP = clonal hematopoiesis of indeterminate potential; EPO = erythropoietin; MDS = myelodysplastic syndromes

Comorbidity Screening

COMORBIDITY	SIGNAL IN MDS*	PRIMARY CARE ACTION
Cardiac disease	Cardiac events affected **73.2%** of Medicare MDS patients at 3 years vs **54.5%** of controls; chronic anemia and iron deposition compound cardiac risk[23,25]	**Optimize cardiac risk factors**; avoid transfusing to arbitrary hemoglobin thresholds
Iron overload	Each RBC unit adds ~200-250 mg iron with no excretion pathway; cardiac iron deposition occurs in ~**16%** of chronically transfused patients[23,26]	**Monitor ferritin**; coordinate chelation after >20-30 transfusions (target ferritin <1000 ng/mL)[2]
Infection/sepsis	Sepsis prevalence **22.5%** in MDS vs **6.1%** in the general Medicare population; frailty doubles sepsis risk[25]	**Maintain vaccination**; evaluate fever urgently in neutropenic patients

COMORBIDITY	SIGNAL IN MDS*	PRIMARY CARE ACTION
Diabetes/endocrine dysfunction	Iron overload can impair endocrine glands; diabetes prevalence **40.0%** vs **33.1%** in controls[25]	**Monitor glucose and endocrine function** in transfusion-dependent patients
Renal impairment	Common in older adults and limits chelation; deferasirox/deferoxamine are contraindicated if **CrCl <40 mL/min**[2]	**Track renal function** before and during chelation; adjust therapy accordingly

ABBREVIATIONS: CrCl = creatinine clearance; MDS = myelodysplastic syndromes; RBC = red blood cell
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

- **Febrile neutropenia** — fever **≥38.3°C** (or **≥38.0°C** sustained **1 hour**) with **ANC <500/mcL**: obtain blood cultures and start empiric broad-spectrum antibiotics emergently
- **Active hemorrhage with severe thrombocytopenia** — platelets **<10,000/mcL** with mucosal, GI, or intracranial bleeding: emergent platelet transfusion
- **Symptomatic severe anemia with hemodynamic instability** — **Hb <7 g/dL** with chest pain, dyspnea, syncope, or tachycardia: emergent RBC transfusion
- **Suspected AML transformation** with acute decompensation — rapidly rising blasts, **DIC**, or leukostasis (altered mental status, respiratory distress): emergent evaluation

⚠ RED FLAG — URGENT (24-72 HOURS)

- **Peripheral blasts** or circulating immature cells on CBC/smear — same-day or next-day hematology contact for possible progression or **AML transformation**
- **Rapidly worsening cytopenias** — new or accelerating decline in **≥2 lineages** over days to weeks
- **ANC <500/mcL** without fever — urgent hematology consultation for monitoring and **G-CSF** consideration
- **New transfusion dependence** — **≥4 RBC units** over **8 weeks** triggers reassessment of disease status and treatment escalation
- **Serum ferritin >2500 ng/mL** in a transfusion-dependent patient — initiate iron-overload evaluation and chelation

3 MEAT DOCUMENTATION ESSENTIALS

MEAT documentation (Monitor, Evaluate, Assess, Treat) allows accurate clinical presentation of MDS. For MDS, **the goal is to document the confirmed subtype, the risk category, transfusion burden, and complications** so the record reflects the patient's true complexity and supports continuity between primary care and hematology.

*Case vignette: A female patient, 78, is seen for fatigue and two recent respiratory infections. CBC shows hemoglobin 9.4 g/dL with MCV 104 fL, ANC 0.7 x10^9/L, and platelets 98 x10^9/L; B12 and folate are normal. Rather than recording anemia, unspecified, the clinician documents persistent bicytopenia and macrocytosis without nutritional cause and refers to hematology; marrow confirms MDS with multilineage dysplasia **(D46.A)**, IPSS-R lower-risk.*

Monitor: "CBC trend: hemoglobin **9.4 g/dL** (MCV **104 fL**), ANC **0.7 x10^9/L**, platelets **98 x10^9/L** — persistent bicytopenia and macrocytosis across serial checks. Transfusion frequency: none to date. Blast percentage: pending marrow biopsy. Ferritin/transferrin saturation: not yet indicated, patient not transfusion-dependent. B12 and folate: **normal**, nutritional cause excluded."

Evaluate: "Marrow aspirate/biopsy confirms **multilineage dysplasia**. Cytogenetics and NGS results pending at time of diagnosis; risk stratification per **IPSS-R: lower-risk**. Macrocytic bicytopenia not explained by nutritional deficiency, medication effect, or alternative marrow process — findings support primary bone marrow failure syndrome rather than anemia of another etiology."

Assess: "**Myelodysplastic syndrome with multilineage dysplasia** (**D46.A**), **IPSS-R lower-risk**. Active complications: symptomatic anemia (fatigue), neutropenia with recent recurrent respiratory infections (**ANC 0.7 x10^9/L**), no active bleeding at this time given **platelets 98 x10^9/L**. No AML transformation identified — blast percentage within diagnostic threshold for MDS."

Treat: "Supportive care initiated: monitor CBC trend, transfusion threshold per hemoglobin and symptom burden, no transfusion indicated today. Hematology co-managing; ESA or luspatercept to be considered per hematology if anemia progresses. No indication for hypomethylating agents or lenalidomide at this time given lower-risk classification. Iron chelation not indicated, patient not transfusion-dependent. Referral to hematology completed; transplant evaluation not indicated given lower-risk disease status. Reassess at next visit for symptom progression or lineage decline."

Clinical Documentation Elements

- **Confirmed MDS subtype** with the supporting marrow finding (dysplasia, blast %, ring sideroblasts, or cytogenetics) and the matching **D46.x** subcode
- **Current blood counts by lineage and transfusion history** (units and interval), which define transfusion dependence
- **IPSS-R or IPSS-M risk category** and the data behind it (cytogenetics, blast %, mutations)
- **Active complications:** symptomatic anemia, neutropenic infection risk, bleeding risk, iron overload

- **Frailty/functional status** from a validated tool (G-8, VES-13, Fried criteria) at diagnosis and before treatment changes
- **Any rise in blast percentage** and the date AML transformation criteria were met, with the code update from **D46.x** to **C92.x**

Reframing Common Documentation Shortcuts

COMMON SHORTCUT	WHY IT FALLS SHORT	REFRAME
Anemia, unspecified	Does not document the confirmed clonal malignancy or its complexity	After marrow confirmation, document the specific MDS subtype (e.g., **D46.A**) with its supporting finding
MDS, unspecified (D46.9)	The single **most common coding error**	Use the specific subcode supported by pathology/ cytogenetics; reserve **D46.9** for genuinely undeterminable subtype
RAEB (unspecified)	Omits the blast percentage that distinguishes **RAEB-1(5-9%) from RAEB-2 (10-19%)**	Document the explicit blast percentage and use **D46.21** or **D46.22** respectively
MDS code continued after AML transformation	Clinically inaccurate once blasts reach **≥20%**, and misrepresents disease severity[1]	Update to the appropriate **C92.x** code when transformation criteria are met
Stable, continue	Leaves monitoring, transfusion burden, and complications undocumented	Record the **counts, transfusion interval, complications addressed, and the plan each visit**

ABBREVIATIONS: AML = acute myeloid leukemia; HCC = Hierarchical Condition Category; MDS = myelodysplastic syndromes; RAEB = refractory anemia with excess blasts

4 TREATMENT AND REFERRAL QUICK GUIDE

Treatment is stratified by **IPSS-R risk category**, and the **NCCN MDS Guidelines (v3.2026)** provide the definitive algorithms. In lower-risk MDS the intent is to improve cytopenias, reduce transfusion burden, and preserve quality of life; in higher-risk MDS the intent is to prolong survival, reduce AML transformation, and bridge to transplant when feasible.

Therapy Escalation Criteria

TRIGGER	WHAT IT INDICATES	ESCALATION
Symptomatic anemia/new transfusion need[2]	Falling hemoglobin with symptoms; **≥4 RBC** units over **8 weeks** marks transfusion dependence[27]	**Start ESA or luspatercept per subtype**; reassess risk category
Rising blast percentage (5-9% -> 10-19%)[2]	Progression from **RAEB-1 to RAEB-2** (MDS-IB1 -> MDS-IB2)	**Reassess risk**; consider HMA
Blasts >=20% or AML-defining genetics[2,5]	Transformation to AML	**Urgent hematology**; HMA-based or intensive therapy
New high-risk cytogenetics (monosomy 7, complex, biallelic TP53)[5]	Higher-risk disease requiring active therapy	**Escalate to HMA** and evaluate transplant candidacy

ABBREVIATIONS: AML = acute myeloid leukemia; ESA = erythropoiesis-stimulating agent; HMA = hypomethylating agent; MDS-IB = MDS with increased blasts; RAEB = refractory anemia with excess blasts; RBC = red blood cell

NCCN (v3.2026) Guideline-Aligned Treatment by Risk and Profile

RISK/PROFILE	GUIDELINE-ALIGNED FIRST-LINE*	NOTES
Lower-risk, del(5q)	**Lenalidomide 10 mg/day**, 21/28 days (category 1 if EPO >500); ESAs if EPO ≤500[2]	Distinct, lenalidomide-responsive subtype
Lower-risk, SF3B1/ring sideroblasts	**Luspatercept 1 mg/kg SC** every 3 weeks (category 1, preferred); escalate to 1.33 then 1.75 mg/kg if no response[2]	Favorable safety profile without increased AML transformation risk
Lower-risk, non-del(5q)/non-RS, EPO <=500	**ESAs** (epoetin alfa **40,000-60,000 U** 1-2x/week SC or **darbepoetin 150-300 mcg** every other week SC); luspatercept preferred if EPO >200[2]	Initiate ESAs before permanent transfusion dependence for more durable responses[28]
Lower-risk, non-del(5q)/non-RS, EPO >500	**Imetelstat 7.1 mg/kg** IV monthly (preferred; category 1 after ESA failure)[2]	Requires baseline platelets **≥75,000** and **ANC 1,500**
Higher-risk, transplant candidate	**Allogeneic HCT from the best available donor**; HMA bridging to reduce blasts to **<5%**[2]	Candidacy is based on fitness, up to age ≥75

RISK/PROFILE	GUIDELINE-ALIGNED FIRST-LINE*	NOTES
Higher-risk, non-transplant candidate	**Azacitidine 75 mg/m2/day** SC/IV x 7 days monthly (category 1; only HMA with phase III survival benefit); decitabine or oral decitabine/ cedazuridine alternatives[2]	Continue **HMA 4-6 cycles** to assess response; refractory -> add venetoclax or IDH-targeted therapy

ABBREVIATIONS: AML = acute myeloid leukemia; ANC = absolute neutrophil count; ESA = erythropoiesis-stimulating agent; HCT = hematopoietic cell transplant; HMA = hypomethylating agent; IDH = isocitrate dehydrogenase; RS = ring sideroblasts; SC = subcutaneous
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

CLINICAL PEARL: FRAILTY AND FUNCTION > RISK SCORE ALONE

Frailty and function often predict outcomes in MDS better than disease-specific risk scores alone. Standard IPSS/IPSS-R systems predict leukemia progression but do not account for frailty, comorbidity, or functional status. A formal geriatric assessment before each treatment decision identifies reversible problems and helps weigh the modest survival benefit of HMAs against quality-of-life impact in frail older adults.

Non-Pharmacologic Care and Supportive Interventions

INTERVENTION	ROLE IN MDS*	PRIMARY CARE SUPPORT
Transfusion support (symptom-guided)	Transfuse for symptomatic anemia only; **target hemoglobin 10-12 g/dL**, **not to exceed 12 g/dL**; use the minimum units to relieve symptoms[2,12]	**Avoid arbitrary hemoglobin triggers**; coordinate scheduling and monitor for iron overload
Iron chelation	Consider after **>20-30 RBC** transfusions; target ferritin <1000 ng/mL; deferasirox oral or deferoxamine SC[2]	**Check renal function** (contraindicated if CrCl <40 mL/min) and annual ophthalmic/auditory monitoring with deferasirox
Infection prevention	**G-CSF is not recommended** for routine prophylaxis but is considered for recurrent or resistant infections[2]	**Keep vaccinations current**; counsel on early fever reporting in neutropenic patients

INTERVENTION	ROLE IN MDS*	PRIMARY CARE SUPPORT
Geriatric/supportive care	Geriatric assessment, nutrition, and psychosocial support are part of the NCCN supportive-care framework; align with geriatric oncology guidance[2]	**Address falls, nutrition, and quality of life**; coordinate palliative input when appropriate

ABBREVIATIONS: CrCl = creatinine clearance; G-CSF = granulocyte colony-stimulating factor; MDS = myelodysplastic syndromes; RBC = red blood cell; SC = subcutaneous
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Medication Safety and Key Interactions

AGENT*	STATUS	KEY SAFETY/INTERACTIONS
Luspatercept[29]	FDA-approved for lower-risk MDS with ring sideroblasts/SF3B1 and ESA-refractory anemia	**Monitor for hypertension and thromboembolism**; no increased AML transformation in trials
ESAs (epoetin alfa, darbepoetin alfa)[30,31]	FDA-approved for anemia; covered under Part B (non-ESRD)	**Target hemoglobin ≤12 g/dL**; higher targets raise thrombotic risk; document EPO level and Hb[2]
Lenalidomide[32]	FDA-approved for MDS with del(5q	**Myelosuppression and thromboembolism risk**; pregnancy contraindicated (REMS); reserve for documented del(5q)
Azacitidine/decitabine (HMAs)[33]	FDA-approved for higher-risk MDS; azacitidine has a phase III survival benefit	**Myelosuppression**; monitor counts; azacitidine is the only HMA with a phase III survival benefit[2]
Imetelstat[34]	FDA-approved for transfusion-dependent lower-risk MDS after ESA failure	**Requires baseline platelets ≥75,000 and ANC ≥1,500**; monitor for cytopenias[2]
Venetoclax (added to HMA)[2,35]	[OFF-LABEL] in MDS; used in select higher-risk/refractory cases	**Tumor lysis and myelosuppression risk**; specialist-directed

AGENT*	STATUS	KEY SAFETY/INTERACTIONS
Ivosidenib/enasidenib (IDH-targeted)[2]	**Ivosidenib: FDA-approved** for relapsed/refractory MDS with **IDH1 mutation** (detected by an FDA-approved test) **Enasidenib: [OFF-LABEL]** in MDS — approved only for IDH2-mutated AML; MDS use is investigational, added to NCCN pathways for mIDH[2] disease[36]	**Differentiation syndrome and QT effects**; reserve for mutation-positive disease
Deferasirox[37]	FDA-approved iron chelator (oral)	**Contraindicated if CrCl <40 mL/min**; monitor creatinine; annual ophthalmic/auditory checks

ABBREVIATIONS: ANC = absolute neutrophil count; CrCl = creatinine clearance; EPO = erythropoietin; ESA = erythropoiesis-stimulating agent; ESRD = end-stage renal disease; HMA = hypomethylating agent; IDH = isocitrate dehydrogenase; REMS = Risk Evaluation and Mitigation Strategy
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

SITUATION	REFER TO	TIMING
Unexplained persistent cytopenia (>=2-4 months)[2,5]	Hematology for marrow biopsy and MDS workup	**Expedited** (within days)
Confirmed MDS[2,5]	Hematology/oncology for risk stratification and therapy; primary care co-manages comorbidities	**At diagnosis and ongoing**
Peripheral blasts/rapidly worsening cytopenias[2,5]	Hematology for suspected progression or AML transformation	**Same-day or next-day**
Transplant-eligible higher-risk disease[2,5]	Transplant center for allogeneic HCT evaluation	**Promptly** once higher-risk disease is identified[38]
Febrile neutropenia/active hemorrhage[2]	Emergency department	**Immediate**

ABBREVIATIONS: AML = acute myeloid leukemia; HCT = hematopoietic cell transplant; MDS = myelodysplastic syndromes

Follow-Up Timing

SETTING/STATUS	MONITORING	INTERVAL*
Lower-risk MDS, stable	CBC with differential; symptom and transfusion review	Every **3-6 months**, individualized[2,12]
Transfusion-dependent	CBC; ferritin and iron studies; assess chelation need	Ferritin periodically; counts with each transfusion cycle[2]
On active therapy (ESA, luspatercept, HMA)	Counts for response and toxicity; reassess transfusion independence	Per agent; HMA response assessed at **4-6 cycles**[2]
Higher-risk MDS	Serial blast counts; reassess risk and transformation	**Frequent**, specialist-directed[2]
CHIP/CCUS surveillance	CBC monitoring per risk; high-risk CCUS monitored **2-4x/year**	Yearly for lower-risk; **2-4x/year for high-risk CCUS**[2]

ABBREVIATIONS: CBC = complete blood count; CCUS = clonal cytopenia of undetermined significance; CHIP = clonal hematopoiesis of indeterminate potential; ESA = erythropoiesis-stimulating agent; HMA = hypomethylating agent; MDS = myelodysplastic syndromes
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Comorbidity Management

COMORBIDITY	PRIMARY CARE ROLE	COORDINATION
Iron overload[2,39]	**Monitor ferritin**; reinforce chelation adherence and renal monitoring	**Coordinate chelation thresholds** with hematology
Cardiac disease[25]	**Optimize blood pressure, lipids, and heart failure care**; chronic anemia compounds cardiac risk	**Share transfusion plan with cardiology** when relevant
Infection risk[2]	**Vaccinate**; evaluate fever promptly in neutropenic patients	**Define a neutropenic-fever plan** with hematology
Diabetes/endocrine[25]	**Monitor glucose and endocrine function** in transfusion-dependent patients	**Manage with endocrinology** as needed
Renal impairment[2]	**Track renal function**; it limits chelation choices	**Adjust chelation and dosing** with hematology/nephrology

ABBREVIATIONS: MDS = myelodysplastic syndromes

Cost-Smart Options

BRAND (EST. COST)	GENERIC (EST. COST)	EST. SAVINGS	COST-SMART APPROACH
Brand Vidaza (azacitidine SC/IV injection) (~$580/100mg vial) at standard MDS dosing avg BSA patient (~$8,120/cycle, ~14 vials)[40]	Generic **azacitidine** SC/IV (**~$25/100mg vial**) → same dosing (**~$350/cycle**)[41]	**~$7,770/cycle**	**Generic azacitidine is the standard-of-care HMA for high-risk MDS and is clinically equivalent to brand Vidaza**; use generic at initiation; premature HMA discontinuation due to cost increases hospitalization risk — coordinate adherence support through specialty pharmacy before prescribing; confirm hematology is managing cycles
Brand Dacogen (decitabine IV injection) (~$1,795/50mg vial) at standard dosing for average BSA patient (~$6,102/cycle, ~3.4 vials)[42]	Generic **decitabine** IV (**~$25–30/vial estimated**)[43]	**~$6,000/cycle**	**Generic decitabine IV eliminates brand cost**
Brand Reblozyl (luspatercept SC q3wk, ~$12,302/75mg vial) → for avg 70kg patient at 1mg/kg: ~$14,155/month[44]	**No biosimilar exists**	N/A	**Reblozyl is FDA-approved only for transfusion-dependent lower-risk MDS with ring sideroblasts** (**D46.1** confirmed on bone marrow biopsy) — do not use for MDS subtypes without confirmed ring sideroblasts; **IRA Part D cap ($2,100/year)** applies for Medicare patients; enroll eligible patients in BMS REACH program proactively; initiating Reblozyl earlier in eligible patients reduces chronic transfusion burden

BRAND (EST. COST)	GENERIC (EST. COST)	EST. SAVINGS	COST-SMART APPROACH
Brand Procrit (epoetin alfa), verified prices by dose strength: 2,000 units/mL 6mL from $321/vial; 10,000 units/mL 6mL from $1,574/vial; 40,000 units/mL 4mL from $4,185/vial[45,46]	Biosimilar **retacrit** (epoetin alfa-epbx), verified by dose: **2,000 units/mL 10mL from $229/vial**; **3,000 units/mL 10mL from $339/vial**; **4,000 units/mL 10mL from $449/vial**[47]	**~20–57% per unit** depending on dose strength[48]	Retacrit is FDA-approved and interchangeable with Procrit for MDS-associated anemia; savings vary by dose — confirm dose-equivalent vial at the specialty pharmacy; initiate **ESA trial before transfusion dependence develops** to avoid the substantially higher cost of chronic transfusion-dependent care; covered under **Medicare Part B**; confirm hematology authorization before PCP initiates

ABBREVIATIONS: HMA = hypomethylating agent; MDS = myelodysplastic syndrome; SC = subcutaneous; IV = intravenous; BSA = body surface area; IRA = Inflation Reduction Act; ESA = erythropoiesis-stimulating agent; Part B/D = Medicare Parts B and D

Patient Education and Adherence

- **Disease overview**: Explain that MDS is a bone marrow condition that lowers blood counts, that it varies widely from slow-progressing to more serious forms, and that monitoring is essential
- **Infection risk**: Counsel on reporting fever promptly
- **Bleeding risk**: Recognizing signs of bleeding or bruising
- **Fatigue management**: Managing fatigue as a common symptom
- **Iron overload**: For transfusion-dependent patients, explain iron overload and why chelation and monitoring matter
- **Shared decision-making**: Reinforce that treatment decisions weigh benefit against quality of life, especially for frail older adults

DOCUMENTATION REMINDER — PATIENT EDUCATION

Document the education provided: infection precautions, bleeding signs, transfusion and chelation rationale, and the shared decision-making discussion. This ensures the record reflects the counseling that supports adherence and safety.

Quality Metrics Tie-In

There are **no HEDIS or CMS Star measures specific to myelodysplastic syndromes** and no dedicated denominator, numerator, or exclusion structure exists. **Accurate ICD-10 coding** (D46.x series, with IPSS-R risk category documented in the problem list) **still supports HCC risk adjustment and MA plan-level quality reporting even in the absence of a disease-specific measure.** Adjacent hematology/oncology measures, such as MIPS #67 (baseline cytogenetic testing), apply indirectly — the PCP's role is to confirm cytogenetics were obtained at diagnosis or during co-management, and to document the result.

MEASURE	STANDARD	APPLICABILITY TO MDS
Hematology: MDS and Acute Leukemias — Baseline Cytogenetic Testing (MIPS #67/ NQF 0377)[49]	**Denominator:** patients ≥18 with a diagnosis of MDS or an acute leukemia (not in remission) with a qualifying encounter during the performance period, submitted at least once per performance period regardless of when the diagnosis was made **Numerator:** baseline cytogenetic testing performed on bone marrow at the time of diagnosis or prior to initiating treatment **Exceptions:** documented medical reason (e.g., fibrotic marrow, insufficient sample), patient reason (e.g., receiving palliative care only), or system reason (e.g., cytogenetics previously performed by another clinician)	**MIPS #67 is a hematology/oncology specialty measure**; PCP role is to confirm cytogenetics were obtained at diagnosis during co-management visits and to document the result and IPSS-R risk category in the problem list. If cytogenetics are absent from the referral records, flag to the hematologist before proceeding with any treatment discussion
Indirect CMS Star Measures (PCR, medication adherence, care coordination, patient experience)	**Plan All-Cause Readmissions (PCR; MIPS #479):** **Denominator:** enrollees ≥18 with acute inpatient discharge. **Numerator:** unplanned readmission within 30 days (lower is better) **Exclusions:** planned readmissions, hospice, psychiatric	**MDS patients in MA plans contribute to plan-level Star scores through readmission rates, azacitidine/decitabine adherence, and care transitions.** PCP coordination with hematology at each treatment cycle reduces infection-related admissions and supports the plan's PCR and adherence metrics. Document a structured follow-up plan after every hospitalization for cytopenias or febrile neutropenia

MEASURE	STANDARD	APPLICABILITY TO MDS

ABBREVIATIONS: CAHPS = Consumer Assessment of Healthcare Providers and Systems; CMS = Centers for Medicare & Medicaid Services; ESA = erythropoiesis-stimulating agent; HEDIS = Healthcare Effectiveness Data and Information Set; HCC = Hierarchical Condition Category; IPSS-R = Revised International Prognostic Scoring System; MA = Medicare Advantage; MDS = myelodysplastic syndromes; MIPS = Merit-based Incentive Payment System; NQF = National Quality Forum; PCR = Plan All-Cause Readmissions; PDC = proportion of days covered; QPP = Quality Payment Program; WHO = World Health Organization

QUALITY OUTCOME

When unexplained cytopenia is worked up promptly, the subtype is confirmed, transfusion burden and iron overload are monitored, and AML transformation is caught early, patients experience fewer avoidable hospitalizations and better-coordinated care. **Better outcomes follow accurate recognition and documentation.**

AAVBC PERSPECTIVE

AAVBC encourages primary care providers to treat persistent, unexplained cytopenia in any patient over 60 as an indication for timely hematology referral rather than a finding attributable to normal aging. MDS is the most common acquired bone marrow failure syndrome in older adults, and the cytopenias it produces are a symptom of an underlying clonal hematopoietic disorder - not a standalone blood abnormality. The referral threshold should be low: unexplained anemia not responding to iron, B12, or folate repletion; new thrombocytopenia or neutropenia without a clear reversible cause; and macrocytosis with normal B12 each warrant evaluation. Definitive diagnosis requires **bone marrow biopsy and cytogenetics**. Peripheral blood review alone is insufficient to confirm or exclude MDS.
AAVBC supports framing MDS as a bone marrow malignancy requiring active diagnostic pursuit, and encourages providers to move away from a watchful waiting posture when cytopenia persists without explanation in this age group. **This helps ensure the right patients are referred for the right evaluation at the right time.**

QUALITY OUTCOME : THE STOJKOV 2020

The Stojkov (2020) guideline-based indicators are not CMS measures and are not MIPS-submittable — they carry no formal denominator, numerator, exclusion structure, or billing/reporting pathway. Rather, they represent **29 expert-consensus quality indicators** developed by the Myelodysplastic Syndrome Foundation across diagnosis, therapy, and infrastructure. Use them as a **quality checklist for comprehensive MDS co-management**, covering timely bone marrow biopsy, WHO classification documentation, transfusion threshold tracking, iron chelation criteria, and ESA response assessment.[50]

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

ICD-10 CODE	DESCRIPTION	DOCUMENTATION TO SUPPORT	V28 HCC (RAF)
D46.0	Refractory anemia without ring sideroblasts	Marrow biopsy: **<5% blasts**, dysplasia, ring sideroblasts explicitly absent	HCC 19 (1.798)
D46.1	Refractory anemia with ring sideroblasts	**≥15%** ring sideroblasts (or **≥5%** with SF3B1 mutation); <5% blasts	HCC 19 (1.798)
D46.21	RAEB-1	Document blast percentage **5-9%** explicitly	HCC 19 (1.798)
D46.22	RAEB-2	Document blast percentage **10-19%** explicitly	HCC 19- consider transformation to AML complexity
D46.C	MDS with isolated del(5q)	Cytogenetics showing isolated 5q deletion documented in the note	HCC 19 (1.798)
D46.9	MDS, unspecified - **avoid when subtype is known**	Use only when WHO subtype is genuinely undeterminable; **~49% of cases miscoded here**	HCC 19 (1.798)
C92.00-C92.02	AML (transformation from MDS)	Blasts **≥20%** or AML-defining genetics; update from the prior **D46.x** code	HCC 17 (4.209)

ABBREVIATIONS: AML = acute myeloid leukemia; CNA = Community Non-Dual Eligible, Aged; HCC = Hierarchical Condition Category; ICD-10 = International Classification of Diseases, 10th Revision; MDS = myelodysplastic syndromes; RAEB = refractory anemia with excess blasts; RAF = Risk Adjustment Factor; V28 = CMS-HCC Model Version 28

RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

Annual Clinical Review and Confirmation

- **MDS** is a chronic condition that **must be re-documented at least annually** so the record continues to reflect active disease and its complexity

- At each annual review, **restate the confirmed subtype with its supporting marrow/cytogenetic finding, the current risk category, transfusion status, and active complications**
- Because disease status can change, the subcode should be re-examined at each review: a rise in blast percentage may move a patient from **D46.21** (RAEB-1) to **D46.22** (RAEB-2); reaching **≥20% blasts** requires updating to a **C92.x** AML code
- **Avoid the unspecified default: D46.9** should be reserved for cases where the WHO subtype is genuinely undeterminable; when pathology, cytogenetics, or molecular testing supports a specific subtype, the specific code represents the patient accurately
- The objective is **faithful representation of clinical complexity** — accurate, specific documentation supports continuity between primary care and hematology, with appropriate risk adjustment as a consequence of good care, never as its purpose

Good Documentation — EHR Tips

EHR TIP	HOW IT HELPS
Build a problem-list entry with the specific D46.x subtype, not anemia, unspecified	Keeps the confirmed malignancy and its complexity visible across visits and clinicians
Add a SmartPhrase capturing subtype + blast % + cytogenetics + IPSS-R risk	Ensures each note carries the data that supports the subcode and the risk category
Flag a blast-percentage threshold (10-19% and ≥20%) in the chart	Prompts the code update **D46.21 -> D46.22 -> C92.x** at progression/transformation
Track transfusion count and ferritin in a flowsheet	Surfaces transfusion dependence and the iron-chelation threshold (>20-30 units)
Reconcile the MDS code at each annual wellness visit	Confirms active disease is re-documented and prevents lapse to an unspecified code

ABBREVIATIONS: EHR = electronic health record; IPSS-R = Revised International Prognostic Scoring System; MDS = myelodysplastic syndromes

Brief Case Examples

SUCCESS — Cytopenia Worked Up, Subtype Confirmed, Care Coordinated

Patient: Female patient, 74, with 14 months of fatigue and two pneumonias; CBC shows hemoglobin 9.1 g/dL (MCV 103 fL), ANC 0.9 x10^9/L, platelets 92 x10^9/L; B12 and folate normal.

Documentation: 'Persistent macrocytic anemia with neutropenia and thrombocytopenia, no nutritional cause -> marrow confirms MDS with multilineage dysplasia **(D46.A)**; cytogenetics

normal; IPSS-R lower-risk. EPO 180 mU/mL; started darbepoetin before transfusion dependence. Frailty screen (G-8) positive -> geriatric referral.'

Outcome: Specific subtype coded (**D46.A**, HCC 19); transfusion need deferred with an ESA started before dependence developed. Ferritin trended; vaccinations confirmed; care coordinated with hematology -- no avoidable hospitalization over the following year.

PITFALL — Unspecified Coding and Omitted Complexity

Documentation as written: 'Elderly patient with anemia, stable. Continue. MDS, unspecified **(D46.9)**'

Consequence: Subtype, blast percentage, and complications not documented; **D46.9** used by default – the most common MDS coding error (~**49%** of registry cases). Neutropenia and recent infections went uncoded, so the note understates the patient's true complexity.

RAF Impact: MDS subtypes map to **HCC 19** (RAF 1.798) regardless of blast percentage, as long as blasts remain below the AML threshold. Once blast percentage reaches **≥20%**, the diagnosis reclassifies entirely to acute myeloid leukemia (**C92.-** series), which maps to **HCC 17** (RAF 4.209) — a substantially higher-value category. The unspecified **D46.9** code not only omits subtype and complications; it also fails to signal where the patient sits relative to that 20% threshold, which is the key inflection point for reclassification and higher-value capture.

Fix: Document explicitly: "MDS with multilineage dysplasia **(D46.A)** confirmed on marrow; blasts <5%; IPSS-R lower-risk. Neutropenia **(ANC 0.9)** with recurrent infection; symptomatic anemia on ESA. Reassess blast % and subtype this year." If serial marrow shows blast progression to ≥20%, re-evaluate for AML and update the diagnosis and code accordingly.

REFERENCES

1. Dotson JL, Lebowicz Y. Myelodysplastic syndrome. In: *StatPearls* [Internet]. StatPearls Publishing; 2026 Jan. Updated July 18, 2022. https://www.ncbi.nlm.nih.gov/books/NBK534126/
2. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Myelodysplastic Syndromes. Version 3.2026. NCCN. Accessed July 7, 2026. https://www.nccn.org/guidelines/guidelines-detail?category=1&id=1337
3. Centers for Medicare & Medicaid Services; National Center for Health Statistics. ICD-10-CM Official Guidelines for Coding and Reporting FY 2026. US Department of Health and Human Services; 2025. Accessed June 9, 2026. https://www.cms.gov/files/document/fy-2026-icd-10-cm-coding-guidelines.pdf
4. Ma X, Does M, Raza A, Mayne ST. Myelodysplastic syndromes: incidence and survival in the United States. *Cancer.*2007;109(8):1536-1542.
5. Sekeres MA, Taylor J. Diagnosis and treatment of myelodysplastic syndromes: a review. *JAMA.* 2022;328(9):872-880. doi:10.1001/jama.2022.14578
6. Cogle CR, Craig BM, Rollison DE, List AF. Incidence of the myelodysplastic syndromes using a novel claims-based algorithm: high number of uncaptured cases by cancer registries. *Blood.* 2011;117(26): 7121-7125.

7. Centers for Medicare & Medicaid Services. 2026 final ICD-10-CM mappings (CMS-HCC V28). CMS; 2025. Accessed July 7, 2026. https://www.cms.gov/medicare/health-plans/medicareadvtgspecratestats/risk-adjustors/2026-model-software

8. Centers for Medicare & Medicaid Services. CMS-HCC model relative factor tables (community, non-dual, aged). CMS; 2024. Accessed July 7, 2026. https://www.cms.gov/files/document/revised-cms-hcc-model-relative-factor-tables.pdf

9. Mo A, Poynton M, Kimber C, et al. Drugs to improve anaemia, quality of life, and physical function in people with myelodysplastic syndromes (MDS). *Cochrane Database Syst Rev.* 2026;7:CD013920.

10. Olnes MJ, Sloand EM. Targeting immune dysregulation in myelodysplastic syndromes. *JAMA.* 2011;305(8):814-819.

11. Bastida JM, López-Godino O, Vicente-Sánchez A, et al. Hidden myelodysplastic syndrome (MDS): a prospective study to confirm or exclude MDS in patients with anemia of uncertain etiology. *Int J Lab Hematol.* 2019;41(1):109-114.

12. Cazzola M. Myelodysplastic syndromes. *N Engl J Med.* 2020;383(14):1358-1374. doi:10.1056/NEJMra1904794

13. Raza M, Khan M, Aziz N, et al. Trends and disparities in mortality due to myelodysplastic syndromes in the US from 1999 to 2020 [abstract]. Presented at: 2025 ASCO Annual Meeting; May 30–June 3, 2025; Chicago, IL.

14. Zhang Q, Yim R, Lee P, et al. Implications of clonal hematopoiesis in hematological and non-hematological disorders. *Cancers.* 2024;16(24):4187.

15. Castillo O, Javaid S, Frasier K, et al. Impact of frailty on patients hospitalized with myelodysplastic syndrome: a nationwide analysis [abstract]. Presented at: 2024 ASCO Annual Meeting; May 31–June 4, 2024; Chicago, IL.

16. Molga A, Wall M, Chhetri R, et al. Comprehensive geriatric assessment predicts azacitidine treatment duration and survival in older patients with myelodysplastic syndromes. *J Geriatr Oncol.* 2020;11(1):114-120.

17. Fega KR, Abel GA, Motyckova G, et al. Non-hematologic predictors of mortality improve the prognostic value of the International Prognostic Scoring System for MDS in older adults. *J Geriatr Oncol.* 2015;6(4):288-298.

18. Falini B, Martelli MP. Comparison of the International Consensus and 5th WHO edition classifications of adult myelodysplastic syndromes and acute myeloid leukemia. *Am J Hematol.* 2023;98(3):481-492.

19. Greenberg PL, Tuechler H, Schanz J, et al. Revised International Prognostic Scoring System for myelodysplastic syndromes. *Blood.* 2012;120(12):2454-2465. doi:10.1182/blood-2012-03-420489

20. Sauta E, Robin M, Bersanelli M, et al. Real-world validation of Molecular International Prognostic Scoring System for myelodysplastic syndromes. *J Clin Oncol.* 2023;41(15):2827-2842. doi:10.1200/JCO.22.01784

21. Adès L, Itzykson R, Fenaux P. Myelodysplastic syndromes. *Lancet.* 2014;383(9936):2239-2252.

22. Foran JM, Shammo JM. Clinical presentation, diagnosis, and prognosis of myelodysplastic syndromes. *Am J Med.*2012;125(7 Suppl):S6-S13.

23. de Montalembert M, Ribeil JA, Brousse V, et al. Cardiac iron overload in chronically transfused patients with thalassemia, sickle cell anemia, or myelodysplastic syndrome. *PLoS One.* 2017;12(3):e0172147.

24. Boucher AA, Dayton VJ, Pratt AR, et al. Three-generation female cohort with macrocytic anemia and iron overload. *Am J Hematol.* 2025;100(1):e1-e5.

25. Goldberg SL, Chen E, Corral M, et al. Incidence and clinical complications of myelodysplastic syndromes among United States Medicare beneficiaries. *J Clin Oncol.* 2010;28(17):2847-2852.

26. Hoff FW, Schulz E, Pavletic S, Mina A. Iron chelation therapy in myelodysplastic syndromes and allogeneic hematopoietic cell transplantation, a delicate balance. *Blood Rev.* 2025;69:101258.

27. Rytelo (imetelstat) [prescribing information]. Geron Corporation; 2024. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b0fab7ca-e578-43c5-9df6-bdaff4182257

28. Hellström-Lindberg ES, Kröger N. Clinical decision-making and treatment of myelodysplastic syndromes. *Blood.*2023;142(26):2268-2281.

29. Reblozyl (luspatercept-aamt) [prescribing information]. Bristol-Myers Squibb Company; 2025. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=82f4d266-3f52-41eb-86ba-0abf3cf468e8

30. Retacrit (epoetin alfa-epbx) [prescribing information]. Pfizer Laboratories Div Pfizer Inc; 2025. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=3af26b0d-8ad0-44e1-a538-8bdb5ab39374

31. Aranesp (darbepoetin alfa) [prescribing information]. Amgen Inc; 2025. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0fd36cb9-c4f6-4167-93c9-8530865db3f9

32. Revlimid (lenalidomide) [prescribing information]. Celgene Corporation; 2025. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=5fa97bf5-28a2-48f1-8955-f56012d296be

33. Azacitidine for injection [prescribing information]. 2025. Accessed July 7, 2026. [VERIFY: Add DailyMed URL for generic azacitidine before publication]

34. [DUPLICATE OF REF 27 — REMOVE BEFORE PUBLICATION]

35. Zeidan AM, Borate U, Pollyea DA, et al. A phase 1b study of venetoclax and azacitidine combination in patients with relapsed or refractory myelodysplastic syndromes. *Am J Hematol.* 2023;98(2):272-281. doi:10.1002/ajh.26771

36. Idhifa (enasidenib) [prescribing information]. Celgene Corporation; 2025. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a5b4cdf0-3fa8-4c6c-80f6-8d8a00e3a5b6

37. Jadenu/Jadenu Sprinkle (deferasirox tablets and granules) [prescribing information]. Novartis Pharmaceuticals Corporation; 2024. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=fee89140-fff1-4443-9f42-24ac004fcda1

38. DeFilipp Z, Ciurea SO, Cutler C, et al. Hematopoietic cell transplantation in the management of myelodysplastic syndrome: an evidence-based review from the American Society for Transplantation and Cellular Therapy Committee on Practice Guidelines. *Transplant Cell Ther.* 2023;29(2):69-81.

39. Rozema J, van Asten I, Kwant B, et al. Clinical view versus guideline adherence in ferritin monitoring and initiating iron chelation therapy in patients with myelodysplastic syndromes. *Eur J Haematol.* 2022;109(6):616-624.

40. Vidaza prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 7, 2026. https://www.drugs.com/price-guide/vidaza

41. Azacitidine prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 7, 2026. https://www.drugs.com/price-guide/azacitidine

42. Dacogen prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 7, 2026. https://www.drugs.com/price-guide/dacogen

43. Vidaza (azacitidine for injection) [prescribing information]. Celgene Corporation; 2025. Accessed July 7, 2026. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=3495a71a-cc04-4776-851f-f185956f32af

44. Reblozyl prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 7, 2026. https://www.drugs.com/price-guide/reblozyl

45. Procrit prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 14, 2026. https://www.drugs.com/price-guide/procrit

46. Epogen prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 14, 2026. https://www.drugs.com/price-guide/epogen

47. Retacrit prices, coupons, copay cards & patient assistance. Drugs.com. Accessed July 14, 2026. https://www.drugs.com/price-guide/retacrit

48. Drug prices and trends for Procrit. DrugPatentWatch. Accessed July 14, 2026. https://www.drugpatentwatch.com/p/drug-price/drugname/PROCRIT

49. Centers for Medicare & Medicaid Services. Quality ID #67 (NQF 0377): hematology — myelodysplastic syndrome (MDS) and acute leukemias: baseline cytogenetic testing performed on bone marrow. 2026 MIPS CQM Specifications. Quality Payment Program. CMS. Accessed July 7, 2026. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2026_Measure_067_MIPSCQM.pdf

50. Stojkov K, Silzle T, Stauber A, et al. Guideline-based indicators for adult patients with myelodysplastic syndromes. *Blood Adv.* 2020;4(23):5966-5980. doi:10.1182/bloodadvances.2020003170

Medical Disclaimer

The information provided by the American Academy of Value-Based Care (AAVBC) in this document, including but not limited to coding guidance, and related content, is intended for educational and informational purposes only. This content is designed to assist healthcare providers, organizations, and professionals in understanding and applying Value-Based Care principles, practices, and regulatory compliance standards.

AAVBC does not provide legal, clinical, or medical advice. The content presented should not be interpreted or relied upon as specific legal, medical, clinical, or professional guidance. While efforts are made to ensure the accuracy and currency of the information provided, AAVBC does not guarantee that the materials presented are complete, comprehensive, or without error.

Providers and healthcare professionals must independently evaluate all content and guidance presented herein in the context of applicable laws, regulations, clinical guidelines, payer policies, patient-specific conditions, and contraindications. Any treatments, procedures, diagnostic approaches, medications, or strategies discussed are illustrative and should not be directly applied without a thorough and independent review of current, evidence-based clinical resources, and regulatory requirements.

For coding, documentation, utilization management, quality measures (including STAR ratings), and compliance matters, users are responsible for consulting official guidelines issued by regulatory bodies, including but not limited to the Centers for Medicare and Medicaid Services (CMS), the American Medical Association (AMA), relevant state agencies, and other authoritative entities.

AAVBC expressly disclaims liability for any loss, claim, or damages arising directly or indirectly from the use or reliance on information provided in this document. Users should consult their organization's legal counsel, compliance officer, or qualified professional advisor for advice specific to their situation. By accessing and using this document, you agree to AAVBC's terms and acknowledge that the use of the content is at your own risk and discretion.