AAVBC
AMERICAN ACADEMY OF VALUE BASED CARE

Sideroblastic Anemia

Quick Reference Guide

2026

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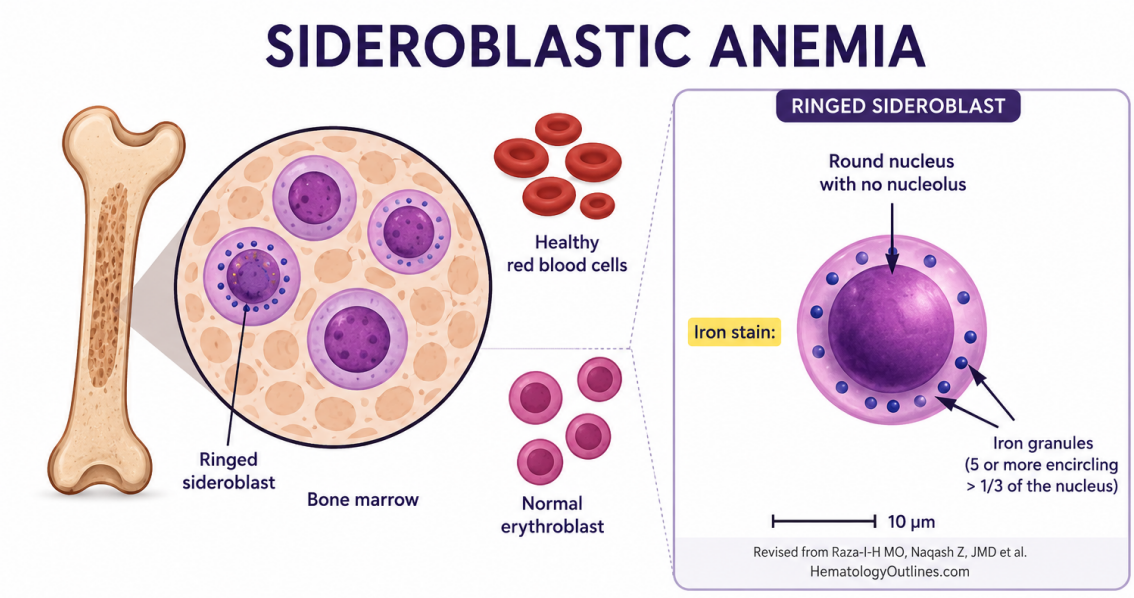
1 CLINICAL SNAPSHOT

Definition: **Sideroblastic anemia** (SA) is a heterogeneous group of disorders **unified by one marrow finding**: **ring sideroblasts** = erythroid precursors with at least **five** siderotic granules covering a minimum of **one-third** of the nuclear circumference[2] on Prussian blue (Perls) staining.[1,2] Iron accumulates in the mitochondria of developing red cells because it **cannot be incorporated into hemoglobin**; the body has iron, but the **machinery to use it is impaired**.[3,4] SA is classified as **congenital** (most often X-linked, from ALAS2 mutations, predominantly affecting males and typically microcytic) or **acquired**.[1,5] Acquired forms span **a spectrum from reversible drug-, toxin-**, and **nutrition-related disease** to clonal hematologic malignancy - most importantly **myelodysplastic syndrome with ring sideroblasts** (MDS-RS), the dominant acquired form in older adults, driven by SF3B1 somatic mutations in approximately **80%** of cases.[1,6] Red-cell size **varies by subtype**: congenital SA is typically **microcytic**, while acquired MDS-RS is frequently **normocytic or macrocytic**; **do not** use **MCV** alone to exclude SA.[7,8]

ICD-10 Codes

Sideroblastic anemia is reported with **etiology-specific subcodes**: **D64.0** (hereditary SA), **D64.1** (secondary SA **due to disease**), and **D64.3** (other SA, including pyridoxine-responsive and SA not otherwise specified) map to HCC 109; **D64.2** (secondary SA due to drugs and toxins) also maps to HCC 109.[9] When a bone marrow study confirms **MDS with ring sideroblasts**, the correct codes are **D46.1** or **D46.B**. **D64.9** (anemia, unspecified) should be avoided once ring sideroblasts are confirmed.[9] Code **reversible drivers** and **complications concurrently**: **F10.20** (alcohol use disorder), **E61.0** (copper deficiency), **E53.1** (vitamin B6 deficiency), **T56.0-** (lead toxicity), and **E83.10-E83.19**/**E83.111** (iron overload/transfusion-related hemochromatosis).[9]

Prevalence and Burden: No US population-based prevalence study exists for sideroblastic anemia (**D64.0**-**D64.3**) as a standalone category; all figures below are **MDS-derived proxy data** and should be read as such.[4,10] MDS incidence is approximately **4 per 100,000** persons per year in the United States, rising to about **25 per 100,000** in persons aged 65 and older; some estimates using SEER-Medicare claims-based algorithms put the true rate near **75 per 100,000** among persons 65 and older due to **registry underreporting**.[10,11] A 2026 update places the median age at MDS diagnosis at **76 years** among US patients.[12] **More than 10,000** MDS diagnoses occur annually in the United States, with approximately **86%** in individuals aged 60 and older.[12,13] The ring-sideroblast subtype accounts for roughly **4–10% of MDS cases**, and **SF3B1-mutant MDS-RS** (the most common genetically defined MDS subtype) carries a relatively favorable median survival of about **6.6 years** in Mayo Clinic data.[1,14] **Anemia in older adults** independently **predicts mortality, hospitalization, falls, and functional decline regardless of its cause**.[15]



HCC/RAF V28 Mapping

ICD-10 CODE(S)[9]	HCC CATEGORY (V28)[16]	RAF (CNA)*[17]	DOCUMENTATION REQUIREMENT[9]
D64.0 (hereditary sideroblastic anemia), D64.1 (secondary sideroblastic anemia due to disease), D64.3 (other sideroblastic anemias)	**HCC 109** Acquired Hemolytic, Aplastic, and Sideroblastic Anemias[27]	**1.145**[26]	Ring sideroblasts on **bone marrow biopsy** (Prussian blue stain); **iron studies** (elevated ferritin and TSAT); **specific etiology documented**; annual re-confirmation
D64.2 (secondary sideroblastic anemia due to drugs and toxins)	HCC 109	1.145	Document the specific causative agent (alcohol, isoniazid, linezolid, chloramphenicol, lead, penicillamine);onset timing, external cause code, ring sideroblasts on bone marrow biopsy, and key labs (Hb, MCV, iron panel, pyridoxine)
D46.1 (refractory anemia with ring sideroblasts), D46.B (refractory cytopenia with multilineage dysplasia and ring sideroblasts)	**HCC 19** Myelodysplastic Syndromes/ Multiple Myeloma/ and Other Cancers	1.798	Use when bone marrow confirms MDS-RS per WHO-HAEM5 / ICC 2022; record SF3B1 status and IPSS-R score. Separate coding pathway from D64.x[7,27]
D64.9 (anemia, unspecified) — AVOID	No HCC	–	Anemia, unspecified; loses the clinical complexity of confirmed SA → always **specify the subtype** once ring sideroblasts are documented

ICD-10 CODE(S)[9]	HCC CATEGORY (V28)[16]	RAF (CNA)*[17]	DOCUMENTATION REQUIREMENT[9]

ABBREVIATIONS: ICD-10 = International Classification of Diseases, 10th Revision; HCC = Hierarchical Condition Category; V28 = CMS-HCC Version 28; RAF = Risk Adjustment Factor; CNA = Community Non-Dual Eligible, Aged; TSAT = Transferrin Saturation; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; WHO-HAEM5 = WHO Classification of Haematolymphoid Tumours, 5th Edition; ICC = International Consensus Classification; SF3B1 = Splicing Factor 3b Subunit 1; IPSS-R = Revised International Prognostic Scoring System; SA = Sideroblastic Anemia; CMS-HCC = Centers for Medicare/Medicaid Services-Hierarchical Condition Category

***RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model;[11] values vary across patient populations based on eligibility and care setting**

Risk-Adjusted Care Resources per Patient/Year[16,17]

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

SIDEROBLASTIC ANEMIA	MYELODYSPLASTIC SYNDROMES + SA
$11.9K	**$18.7K**
HCC 109 · RAF 1.144	HCC 19 · RAF 1.798

AAVBC PERSPECTIVE

***From the AAVBC's perspective, value-based care in sideroblastic anemia (SA)** requires replacing **reflexive iron supplementation** with **accountable diagnostic stewardship**, particularly in older adults where acquired disease is frequently underrecognized and may represent an underlying myelodysplastic syndrome with ring sideroblasts (**MDS-RS**).[4,10] Persistent microcytic, normocytic, or macrocytic anemia that f**ails to respond to empiric iron therapy** should immediately trigger a **comprehensive iron panel** (serum iron, ferritin, transferrin saturation) rather than repeated supplementation, **with explicit documentation of** "suspected sideroblastic anemia→hematology referral."[6] PCPs should recognize that **SA demonstrates the inverse iron profile of iron deficiency**, with normal-to-elevated serum iron, elevated ferritin, and increased transferrin saturation; administering iron to an iron-overloaded patient may **accelerate end-organ injury** (liver, pancreas, heart, endocrine glands) rather than improve anemia.[6,18]*

*Primary care should also recognize the **two major diagnostic traps**: acquired SA, the predominant form in adults, is **commonly normocytic or macrocytic**, and empiric pyridoxine therapy is **only effective in selected hereditary ALAS2-associated disease**.[4,6,18] In adults older than 60 years, unexplained anemia with iron overload should **prompt evaluation for MDS-RS**, **medication-induced disease**, alcohol use, copper deficiency, or toxin exposure.[10,18] Definitive diagnosis requires **bone marrow examination** with **Prussian blue staining** to identify ring sideroblasts.[4] The PCP's role extends beyond recognition to **preventing avoidable harm by withholding iron** until iron studies are reviewed and ensuring **timely hematology evaluation** for a condition that is often a manifestation of an underlying clonal hematologic disorder rather than a benign nutritional deficiency.[4,10]*

CLINICAL PEARL: IN IRON OVERLOAD, SUPPLEMENTAL IRON ACCELERATES ORGAN DAMAGE

In sideroblastic anemia, defective heme synthesis **traps iron in erythroblast mitochondria** while the body paradoxically **increases intestinal iron absorption** via hepcidin suppression.[4,19] Transfusion-dependent patients **accumulate additional iron** with every unit of packed red cells.[6,19] When transferrin saturation **exceeds ~75%**, unbound non-transferrin-bound iron (NTBI) enters parenchymal cells and generates reactive oxygen species, causing **progressive damage** in a predictable pattern:[20,21]

- **Liver → fibrosis, cirrhosis, hepatocellular carcinoma**[21,22]
- **Heart → restrictive cardiomyopathy, arrhythmias** (leading cause of death)[21,23]
- **Pancreas → beta-cell destruction, secondary diabetes**[22]
- **Endocrine → hypogonadism, hypothyroidism, hypoparathyroidism**[21]

The body has no **physiologic mechanism to excrete excess iron**; every unnecessary supplement, iron-fortified food, or cast-iron-cooked meal adds to a burden only removable by chelation or phlebotomy.[20,22] Counsel patients that sideroblastic anemia **requires iron avoidance**, not replacement, and **initiate chelation after 20–30 RBC transfusions** to prevent irreversible organ damage.[6]

2 RECOGNITION AND DIAGNOSIS

Medicare Diagnostic Workup and Surveillance (Adult and Geriatric)

There is no population-based screening test for sideroblastic anemia; evaluation is symptom- or cytopenia-triggered.[6,10] Coverage applies to diagnostic workup and monitoring, not screening. **Medicare Part B** covers the following diagnostic tests and monitoring **when medically necessary**:

TEST	FREQUENCY[6]	CPT/ HCPCS	CLINICAL INDICATION[6,10]
CBC with differential	**At initial evaluation** of unexplained anemia or cytopenia; serial monitoring during treatment	85025	**Baseline test for any unexplained anemia**; establishes degree of cytopenia(s) and guides further workup;
Iron studies (serum iron, ferritin, TIBC, TSAT)	**At initial anemia evaluation**; periodically during transfusion therapy or iron chelation	83540, 82728, 83550	SA characteristically shows **elevated ferritin** and **TSAT (unlike iron deficiency)**; the single **most important early test to distinguish SA from iron-deficiency anemia**; iron repletion must be verified before initiating ESA therapy

TEST	FREQUENCY[6]	CPT/ HCPCS	CLINICAL INDICATION[6,10]
Reticulocyte count	**At initial evaluation**; as needed to assess erythropoietic response	85045	**Evaluates marrow erythropoietic activity**; low reticulocyte count in the setting of anemia supports hypoproductive etiology (MDS-RS, congenital SA)
Peripheral blood smear	**At initial evaluation**	85060	**Identifies**: dimorphic red cell population (mixed normocytic/microcytic or hypochromic), basophilic stippling, and Pappenheimer bodies **suggestive of SA**; **insufficient alone** to confirm ring sideroblasts
Serum erythropoietin (EPO) level	**Before** initiating ESA or luspatercept; **prior to** RBC transfusion	82668	EPO **<200 mU/mL** is the **most reliable predictor of ESA response**; EPO **>500 mU/mL** defines **ESA ineligibility** and directs toward luspatercept or imetelstat per NCCN
Bone marrow aspiration + biopsy with iron stain	**At diagnosis** when SA or MDS is suspected; anemia unresponsive to **2–3 months** of empiric therapy	38222, 88313	***Prussian blue stain* is required to identify ring sideroblasts** (≥5 siderotic granules covering ≥⅓ nuclear circumference); peripheral smear alone is insufficient; also provides cytogenetics, blast percentage, and cellularity for **MDS classification**
Hepatic R2* MRI for iron quantification	**When ferritin >1,000 ng/mL** or suspected hepatic iron overload; periodically during chelation	77084	Preferred **noninvasive method** to quantify **hepatic iron concentration** in older adults; **avoids liver biopsy**; guides initiation and monitoring of iron chelation therapy

ABBREVIATIONS: CBC = Complete Blood Count; CPT = Current Procedural Terminology; HCPCS = Healthcare Common Procedure Coding System; TIBC = Total Iron-Binding Capacity; TSAT = Transferrin Saturation; SA = Sideroblastic Anemia; ESA = Erythropoiesis-Stimulating Agent; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; EPO = Erythropoietin; RBC = Red Blood Cell; NCCN = National Comprehensive Cancer Network; MDS = Myelodysplastic Syndrome; MRI = Magnetic Resonance Imaging

Subtle Signs in Older Adults

SIGN/SYMPTOM[24,25]	CLINICAL SIGNIFICANCE[4,26]
Progressive exertional fatigue and dyspnea	Commonly attributed to deconditioning, age, or heart failure; anemia is not always considered the driver → **check CBC** and if anemic, **order iron studie**s before assuming a cardiac or pulmonary cause

SIGN/SYMPTOM[24,25]	CLINICAL SIGNIFICANCE[4,26]
Anemia that does not respond to iron	**Iron is often given empirically for any anemia**; non-response is misread as poor adherence → treat **non-response as a red flag**; obtain a full iron panel and reconsider the diagnosis; **do not escalate iron**
Normal or high MCV in an anemic older adult	A non-low MCV is taken to rule out a marrow or iron problem, so SA is dropped from the differential → **order iron studies regardless of MCV**; acquired MDS-RS is frequently **normocytic or macrocytic**
New falls, near-falls, or functional decline	Falls are common in older adults and **rarely linked back to anemia** → treat anemia as a **modifiable fall-risk factor**; anemia is independently associated with dependence in daily activities
Cognitive slowing or low mood with chronic anemia	Overlaps with dementia and depression; **anemia contribution is overlooked** → address the anemia in parallel; chronic anemia is associated with **cognitive decline** in older adults

ABBREVIATIONS: CBC = Complete Blood Count; SA = Sideroblastic Anemia; MCV = Mean Corpuscular Volume; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts

Geriatric Risk Factors

RISK FACTOR	RISK SIGNAL[1,6]	NOTES[6,27]
Age over 60	**MDS-RS** is predominantly a **disease of older adults**; median age at MDS diagnosis is about **76 years**	The **most common acquired SA** in this age group is **clonal** (MDS-RS), **not nutritional** → escalate accordingly
SF3B1 somatic mutation	Present in **~80%** of MDS-RS and **20-30%** of all MDS; the **K700E variant** independently predicts favorable survival	Anchors a **clonal diagnosis and prognosis**; non-K700E variants **do not** share the favorable outlook
Chronic alcohol use	One of the most **common reversible** acquired causes of ring sideroblasts (**D64.2**)	**Screen with SBIRT**; ring sideroblasts can resolve **within 3-6 months** of abstinence
Copper deficiency/ high-dose zinc	Excess zinc blocks copper absorption; **copper deficiency causes reversible SA**	**Common with**: post-gastric-bypass status, malabsorption, supplement use, and zinc-containing denture adhesive
Causative drug exposure	**Isoniazid, linezolid, chloramphenicol**, and **penicillamine** are established causes (**D64.2**)	Review every medication against the **AGS Beers Criteria**; **co-administer pyridoxine** with isoniazid

RISK FACTOR	RISK SIGNAL[1,6]	NOTES[6,27]
Lead exposure/ pyridoxine (B6) deficiency	Recognized non-clonal causes; **B6 deficiency** is relevant with poor nutrition or polypharmacy	Check a **lead level** with exposure history; **assess B6 status** in malnourished older adults

ABBREVIATIONS: MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; MDS = Myelodysplastic Syndrome; SA = Sideroblastic Anemia; SBIRT = Screening, Brief Intervention, and Referral to Treatment; AGS = American Geriatrics Society; B6 = Vitamin B6 (Pyridoxine)

Diagnostic Thresholds (WHO-HAEM5/ICC 2022 & IPSS-R)

CRITERION/SYSTEM	DEFINITION OR THRESHOLD	CLINICAL USE
Ring sideroblast (diagnostic finding)[1,2]	Erythroid precursor with **at least 5 siderotic granules** over at least **1/3 of the nuclear circumference** on Prussian blue stain	**Hallmark of SA**; requires **bone marrow aspiration** with iron stain
WHO-HAEM5/ICC 2022 - MDS-SF3B1[6,28]	**Ring sideroblasts at least 15%** (or at least 5% with an SF3B1 mutation), **marrow blasts under 5%**, without del(5q), multi-hit TP53, -7/del(7q), or complex cytogenetics	Defines clonal MDS-RS as a **genetically defined entity**; drives **D46.1** versus **D64.3** coding
IPSS-R (Greenberg 2012)[6,29]	**Five variables** (cytogenetics, marrow blasts, hemoglobin, platelets, ANC); strata **Very Low** (≤1.5) to **Very High** (>6.0); **≤3.5** lower-risk, **>3.5** higher-risk	NCCN-preferred MDS risk stratification; lower-risk median survival **~5.9 years** versus **~1.5 years** higher-risk
IPSS-M (molecular)[6,30]	Integrates **31 gene mutations** into the IPSS-R framework; reclassifies about **46%** of patients versus IPSS-R	**Refines risk**, especially for SF3B1-mutant MDS-RS; increasingly adopted, **not yet universal**
MDS Comorbidity Index (MDS-CI)[31,32]	Integrates comorbid conditions with IPSS-R **to refine prognostication**	Useful in the **elderly MA population**, where comorbidity burden modifies survival
Iron-study pattern (SA vs IDA)[33,34]	**SA**: elevated serum iron, normal-to-high ferritin, high TSAT; **IDA**: low iron, low ferritin, low TSAT	The bedside pivot that **prevents harmful iron supplementation in SA**

CRITERION/SYSTEM	DEFINITION OR THRESHOLD	CLINICAL USE

ABBREVIATIONS: SA = Sideroblastic Anemia; WHO-HAEM5 = WHO Classification of Haematolymphoid Tumours 5th Edition; ICC = International Consensus Classification; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; MDS = Myelodysplastic Syndrome; IPSS-R = Revised International Prognostic Scoring System; NCCN = National Comprehensive Cancer Network; IPSS-M = Molecular International Prognostic Scoring System; IDA = Iron-Deficiency Anemia; TSAT = Transferrin Saturation; ANC = Absolute Neutrophil Count

IPSS-R Scoring

The **IPSS-R** is the **current standard for MDS risk stratification**, using five variables summed to a total score of **0–10**.[6,10] A clinical cutoff of **≤3.5** (lower-risk) vs **>3.5** (higher-risk) is used in practice to guide **treatment intensity**.[4,6] The NCCN MDS Guidelines note that **IPSS-R Intermediate-risk MDS** may be managed as lower-risk **if score ≤3.5** versus **higher-risk if >3.5**.[6]

PROGNOSTIC CATEGORY	PROGNOSTIC SCORE VALUE						
PROGNOSTIC CATEGORY	**0**	**0.5**	**1**	**1.5**	**2**	**3**	**4**
Cytogenetics	Very good		Good		Intermediate	Poor	Very poor
BM Blasts,%	≤2		>2 to <5		5-10	>10	
Hgb, g/dl	≥10		8 to <10	<8			
Platelets, x10^9 L	≥100	50 to <100	<50				
ANC, x10^9 L	≥0.8	<0.8					

CYTOGENETIC GROUP	CHARACTERISTICS
Very good	-Y, del(11q)
Good	Normal, del(5q), del(12p), del(20q), del(5q) + 1 additional abnormality
Intermediate	del(7q), +8, +19, i(17q), other abnormalities not in other groups
Poor	-7, inv(3)/t(3q), -7/del(7q) + 1 additional abnormality, complex (3 abnormalities)
Very poor	Complex (>3 abnormalities)

ABBREVIATIONS: BM = Bone Marrow; Hgb = Hemoglobin; ANC = Absolute Neutrophil Count

Survival and AML Progression Implications of IPSS-R Scores

RISK CATEGORY	SCORE	MEDIAN SURVIVAL (YR)	25% AML PROGRESSION (YR)
Very Low (19%)	**≤1.5**	8.8	**Not reached**
Low (38%)	**>1.5–3.0**	5.3	10.8
Intermediate (20%)	**>3.0–4.5**	3	3.2
High (13%)	**>4.5–6.0**	1.6	1.4
Very High (10%)	**>6.0**	0.8	0.7

IPSS-M Scoring (Molecular)

The **IPSS-M** integrates **31 gene mutations** (16 main-effect + 15 residual genes) with **IPSS-R clinical variables** to produce a personalized continuous risk score.[6,30] It reclassifies approximately **46%** of patients compared with IPSS-R alone, with particular relevance for **SF3B1-mutant MDS-RS**, where favorable SF3B1α mutations may **downstage risk**.[6,30]

RISK CATEGORY	SCORE	MEDIAN OS (YR)	MEDIAN LFS (YR)	AML-T BY 2 YR (%)
Very Low (14%)	**≤−1.5**	10.6	**9.7**	**1.2**
Low (33%)	**>−1.5 to −0.5**	6	5.9	3.4
Moderate Low (11%)	**>−0.5 to 0**	4.6	4.5	8.8
Moderate High (11%)	**>0 to 0.5**	2.8	2.3	14
High (14%)	**>0.5 to 1.5**	1.7	1.5	21.2
Very High (17%)	**>1.5**	1	0.76	38.6

MDS Comorbidity Index (MDS-CI)

The MDS-CI was developed to capture the independent effect of **comorbid conditions** on **non-leukemic death in MDS patients**.[32] Cardiac disease (**2x weighting**), liver disease, renal disease, pulmonary disease, and solid tumors are scored at diagnosis.[32] Integration of the MDS-CI with the IPSS-R significantly improves prognostic accuracy, particularly in elderly patients where comorbidity burden may outweigh disease-related risk.[31]

MDS-CI RISK GROUP	COMORBIDITY SCALE	PROGNOSTIC IMPACT
Low	**0**	**Reference group**; lowest non-leukemic death risk

MDS-CI RISK GROUP	COMORBIDITY SCALE	PROGNOSTIC IMPACT
Intermediate	**1–2**	~50% higher mortality vs low-risk
High	**≥3**	~70% higher mortality vs low-risk

Clues to Dig Deeper

CLUE[1,35]	WHY IT MATTERS*[4,26]	NEXT DIAGNOSTIC STEP*[6]
Anemia with elevated ferritin and high TSAT	**Iron-overload pattern** = opposite of iron deficiency; **consistent with SA**	**Stop iron**; order bone marrow with **Prussian blue stain**; refer to hematology
Dimorphic red cells, basophilic stippling, or Pappenheimer bodies on smear	Iron-loaded inclusions or two red-cell populations **raise SA/MDS suspicion**	**Order iron studies**; if SA pattern, proceed to bone marrow with iron stain; check **lead level** if exposure plausible
New macrocytosis or dysplasia in a patient previously labeled D64.3	Possible **clonal evolution to MDS-RS**	Repeat bone marrow **with molecular testing**; reclassify to **D46.1/D46.B** if confirmed
Anemia unresponsive after 2–3 months off offending agent or on pyridoxine	**Reversible cause excluded**; clonal disease likely	**Bone marrow biopsy with cytogenetics and molecular panel**; hematology referral
SF3B1 or other MDS-associated mutation on molecular testing	Confirms **clonal myeloid disease**; defines a genetically distinct MDS-RS entity	**Hematology consultation** for risk stratification and treatment planning per NCCN
Serum EPO >500 mU/mL in confirmed MDS-RS	Defines **ESA ineligibility**	Direct toward **luspatercept** or **imetelstat** per NCCN; **do not trial ESAs**

ABBREVIATIONS: TSAT = Transferrin Saturation; SA = Sideroblastic Anemia; MDS = Myelodysplastic Syndrome; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; EPO = Erythropoietin; ESA = Erythropoiesis-Stimulating Agent; NCCN = National Comprehensive Cancer Network; SF3B1 = Splicing Factor 3b Subunit 1 Gene
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Common Oversights

COMMON OVERSIGHT[1,34,36]	CONSEQUENCE*[6,19,20]
Treating refractory anemia empirically with iron	**Worsens systemic iron overload**; can precipitate hepatic, cardiac, and endocrine injury → order a full iron panel **before** any iron; **withhold iron** when ferritin and TSAT are elevated
Using MCV to exclude SA	Acquired MDS-RS is frequently **normocytic or macrocytic**; SA is dropped prematurely from the differential → **order iron studies regardless of MCV** when anemia is unexplained in an older adult
Not recognizing MDS-RS behind acquired SA in adults over 60	**Delays a hematologic malignancy diagnosis** and access to MDS-directed therapy (luspatercept, imetelstat) → in acquired SA over age 60, **rule out MDS-RS first**; pursue marrow and **SF3B1** testing
Relying on peripheral smear or iron panel alone for diagnosis	SA cannot be confirmed without ring sideroblasts on bone marrow; **diagnosis is delayed** → refer for bone marrow aspiration with Prussian blue staining, **the gold standard**
Treating all SA with pyridoxine	Pyridoxine helps mainly hereditary X-linked (**ALAS2**) SA; over-reliance **delays referral in MDS-RS** → reassess after 2–3 months; if no response, proceed to **marrow biopsy** and **hematology referral**
Missing iron overload as a complication	Under-recognized **organ damage from transfusion dependency** and ineffective erythropoiesis → monitor ferritin and TSAT serially; act on **ferritin >1,000 ng/mL** with chelation evaluation

ABBREVIATIONS: MCV = Mean Corpuscular Volume; SA = Sideroblastic Anemia; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; TSAT = Transferrin Saturation; MDS = Myelodysplastic Syndrome; SF3B1 = Splicing Factor 3b Subunit 1 Gene; ALAS2 = 5-Aminolevulinate Synthase 2 Gene
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Key Differentials in Elderly

PRESENTATION	DIFFERENTIAL[37–39]	KEY TESTS[1,6,28,34]
Microcytic or normocytic anemia with low ferritin and low TSAT	**Iron-deficiency anemia** (IDA)	Low iron, low ferritin, low TSAT = **inverse of SA**; most common misclassification; **iron worsens SA patients**
Normocytic anemia with elevated inflammatory markers	Anemia of **chronic disease/ inflammation**	Elevated ferritin from inflammation but **no ring sideroblasts**; ferritin is an acute-phase reactant → **check CRP**
Macrocytic anemia with hypersegmented neutrophils	**B12/folate deficiency** (megaloblastic anemia)	Iron-overload markers **absent**; **can coexist with SA**; check B12, methylmalonic acid, and folate

PRESENTATION	DIFFERENTIAL[37–39]	KEY TESTS[1,6,28,34]
Cytopenias with multilineage dysplasia or increased blasts	**Other MDS subtypes** or **acute leukemia**	Higher-risk disease changes prognosis and urgency; **>5% peripheral blasts** warrants **urgent hematology referral**
Basophilic stippling with exposure history	**Lead poisoning**	**Reversible** cause of ring sideroblasts; check blood lead level when **history suggests exposure**

ABBREVIATIONS: IDA = Iron-Deficiency Anemia; SA = Sideroblastic Anemia; TSAT = Transferrin Saturation; CRP = C-Reactive Protein; MDS = Myelodysplastic Syndrome; B12 = Vitamin B12

Comorbidity Screening

CONDITION	PREVALENCE/ ASSOCIATION*[4,19,40]	SCREENING APPROACH*[6,10]
Iron overload/secondary hemochromatosis (E83.10–E83.19)	**Ineffective erythropoiesis and transfusion dependency** (~200–250 mg iron/unit); hepatic, cardiac, and endocrine **toxicity**	**Serial ferritin and TSAT**; R2* MRI when ferritin **>1,000 ng/mL**; chelation after **>20–30 transfusions**
Cardiovascular disease (I25.-, I50.-)	Chronic anemia **increases cardiac demand**; iron-overload cardiomyopathy recognized	Target Hgb **10–12 g/dL** per NCCN; coordinate with cardiology
Chronic kidney disease (N18.-)	**Reduces ESA response**; limits deferasirox (nephrotoxic)	**eGFR-based dosing**; deferasirox contraindicated if eGFR <40
Cognitive impairment/dementia (F03.-, G30.-)	Anemia associated with **34–57%** increased dementia risk	**Assess caregiver capacity**; address anemia as modifiable contributor
Nutritional deficiency (E61.0 copper, E53.1 B6)	**Reversible SA from**: malabsorption, post-bypass, or zinc-containing products	**Check copper and B6**; review supplements at each visit

ABBREVIATIONS: SA = Sideroblastic Anemia; TSAT = Transferrin Saturation; MRI = Magnetic Resonance Imaging; Hgb = Hemoglobin; NCCN = National Comprehensive Cancer Network; ESA = Erythropoiesis-Stimulating Agent; eGFR = Estimated Glomerular Filtration Rate; B6 = Vitamin B6
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

These emergency conditions require **immediate intervention** in patients with sideroblastic anemia/MDS-RS:

- **Symptomatic severe anemia** (Hgb <6 g/dL): dyspnea at rest, chest pain, altered mental status, or hemodynamic instability[6,41]
  - → **Emergent RBC transfusion**; type and crossmatch; continuous monitoring
- **Acute heart failure decompensation**: pulmonary edema secondary to severe chronic anemia or iron-overload cardiomyopathy[41,42]
  - → **Emergent stabilization**; cardiology consultation; transfuse cautiously (1 unit at a time with diuretic cover in volume-sensitive patients)
- **Signs of leukemic transformation** (MDS → AML): new high fever, severe bleeding, rapidly worsening pancytopenia, or circulating blasts on peripheral smear[4,6]
  - → **Emergent CBC** with differential and peripheral smear; immediate hematology/oncology consultation; if **blasts >20%**, manage as **acute myeloid leukemia**

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

These urgent conditions require expedited evaluation and intervention:

- **Rapidly falling hemoglobin** (>2 g/dL drop in <2 weeks) without an obvious bleeding source[6,10]
  - → **Urgent hematology contact**; evaluate for disease progression, hemolysis, or marrow failure
- **New pancytopenia** (anemia with neutropenia and thrombocytopenia) suggesting **marrow failure or MDS progression**[6,10]
  - → Same-day or next-day **hematology evaluation**; repeat CBC with differential and peripheral smear
- **Severe iron overload with organ dysfunction**: ferritin >2,500 ng/mL with rising liver enzymes, new-onset diabetes, or arrhythmia[6,10]
  - → **Urgent hepatic R2* MRI**; initiate or intensify chelation; cardiology if arrhythmia present
- **Peripheral blasts >5% suggesting transformation to higher-risk MDS or AML**[4,6]
  - → Expedited bone marrow biopsy and hematology referral; reclassification may change treatment urgency

3 MEAT DOCUMENTATION ESSENTIALS

Sideroblastic anemia documentation translates a **complex**, **etiology-driven anemia** into a record that supports **continuity**, **transfusion-minimizing care**, and **accurate representation of clinical complexity**. The most common gaps are defaulting to **D64.9** (anemia, unspecified) instead of the specific subtype, failing to record the **marrow confirmation** and **iron-study pattern** that justify the diagnosis, and **omitting iron overload** and its causes. Each gap **obscures the clinical picture** and impedes coordination with hematology.

***Case vignette**: A 74-year-old male presents to his PCP with three months of worsening fatigue and exertional dyspnea. CBC shows hemoglobin 8.9 g/dL with **a normal MCV**. He was started on oral iron two months ago for presumed iron-deficiency anemia **without improvement**. **Past medical history**: chronic kidney disease (eGFR 38), hypertension, and longstanding moderate alcohol use. Iron studies now show ferritin 920 ng/mL and TSAT 62% = an **iron-overload pattern**. Iron is stopped and he is referred for marrow evaluation.*

MONITOR: "Hb 8.9, MCV normal, no response to 2 months oral iron. Ferritin 920, TSAT 62% → **iron-overload pattern**. **Iron stopped today**. eGFR 38 (CKD 3b, **N18.32**). BP at goal (HTN, **I10**). Moderate alcohol use ongoing (**F10.10**)."

EVALUATE: "EPO level drawn. BM biopsy with **Prussian blue stain**, **SF3B1**, and cytogenetics ordered. Copper (**E61.0** if deficient), B6 (**E53.1** if deficient) checked. SBIRT completed. Med review for offending agents → none identified."

ASSESS: "**Iron-overload anemia**, iron-refractory; SA suspected, **marrow pending**. R/O MDS-RS given age >60 and alcohol history. Active Dx: **D64.3** (SA NOS); **N18.32** (CKD 3b); **F10.10** (alcohol use, moderate); **I10** (HTN); **E83.10** (iron overload, suspected). Will reclassify **D64.3** → **D46.1** (MDS-RS) and confirm **E83.10 once marrow and SF3B1 results return**."

TREAT: "Iron held, **do not resume**. Alcohol cessation counseled. Hb target 9–10 g/dL. Hematology referral for **luspatercept vs. ESA** selection per EPO level. Chelation threshold ferritin >1,000; **deferasirox contraindicated** at eGFR 38 (**N18.32**). F/u CBC and iron studies 4 weeks; marrow results 2 weeks. ACP discussed."

Clinical Documentation Elements

- **State the specific subtype and code**: hereditary (**D64.0**), secondary to disease (**D64.1**), drug/toxin (**D64.2**), or other/NOS (**D64.3**); **never default to D64.9** once ring sideroblasts are confirmed[9,10]
- **Record the diagnostic basis**: **ring sideroblasts** on bone marrow with Prussian blue stain **plus iron-study pattern** (elevated ferritin and TSAT); peripheral smear alone is **insufficient**; document **marrow confirmation date and result**[4,9]
- **Document SF3B1 status and IPSS-R score** when MDS-RS is confirmed; code **D46.1/D46.B** rather than **D64.x**; this changes HCC category (HCC 19 vs. HCC 109), RAF, and **access to MDS-directed therapies**[6,9,16]
- **Document reversible drivers as separate codes alongside SA**: alcohol use (**F10.10/F10.20**), copper deficiency (**E61.0**), B6 deficiency (**E53.1**), causative drug, or lead toxicity (**T56.0-**); each has its **own treatment pathway**[6,9]

- **Document iron overload explicitly** (**E83.10–E83.19**; **E83.111** for transfusion-related) with **ferritin values and organ involvement** → hepatic (**K76.89**), cardiac (**I43**), or endocrine (**E89.x**); leading **preventable** complication[9,10]
- **Note transfusion history**, **frequency**, and **functional hemoglobin target** (9–10 g/dL); document hematology co-management, ESA or luspatercept status, and iron-overload surveillance schedule[6]
- **Code each comorbidity separately alongside SA**: **N18.x** (CKD), **I10** (HTN), **F03.x**/**G30.x** (cognitive impairment), **R29.6** (fall risk); chronic conditions require annual HCC remapping[9,16]
- **Document advance care planning**, surrogate decision-maker, and code status; critical for older adult patients with **transfusion-dependent anemia** and accumulating end-organ damage
- **Document SDOH context with Z-codes when present** (**Z59.xx** housing, **Z59.41** food insecurity, **Z91.14** medication noncompliance); **supports care planning** and MA supplemental benefit justification[9]

Reframing Common Documentation Shortcuts

INSTEAD OF…	DOCUMENT…[1,4,6,40]
"Anemia"	"Sideroblastic anemia, secondary to disease (**D64.1**); ring sideroblasts confirmed on marrow; ferritin 920, TSAT 62%" → **subtype-specific at every encounter**
"Iron studies show high iron"	"Iron-overload pattern: ferritin **920 ng/mL**, TSAT 62% → inconsistent with iron deficiency; **iron held**" → names the pattern that **prevents harmful iron supplementation**
"Anemia, likely MDS"	"MDS-RS (**D46.1**), **SF3B1 K700E-mutated**, IPSS-R lower-risk; ring sideroblasts 22%; blasts <5%" → documents **clonal diagnosis** with distinct coding pathway
"On transfusions"	"**Transfusion-dependent SA**; 2 units pRBC q4 weeks; ferritin 920 → 1,180; chelation threshold approaching; deferasirox deferred per CKD (eGFR 38); R2* MRI ordered" → pair transfusion with **iron-overload follow-up**
"Continue current management"	"Alcohol cessation counseled (**F10.10**); **iron held**; Hb target 9–10 g/dL; luspatercept started per EPO >200; hematology co-managing" → the **cause drives care**

INSTEAD OF…	DOCUMENT…[1,4,6,40]
"B12/folate deficiency anemia" for a patient with confirmed ring sideroblasts	"SA (**D64.3**) with **concurrent B12 deficiency** (**E53.8**); ring sideroblasts confirmed; B12 repleted; SA persists" → distinguish **coexisting nutritional deficiency** from SA
"Iron deficiency anemia" in a patient with elevated ferritin and TSAT	**Verify IDA vs. SA**: IDA = low ferritin, low TSAT; SA = the inverse; **NEVER substitute D50.9** when iron-overload markers and ring sideroblasts are confirmed

ABBREVIATIONS: TSAT = Transferrin Saturation; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; SF3B1 = Splicing Factor 3b Subunit 1 Gene; IPSS-R = Revised International Prognostic Scoring System; SA = Sideroblastic Anemia; pRBC = Packed Red Blood Cells; CKD = Chronic Kidney Disease; eGFR = Estimated Glomerular Filtration Rate; MRI = Magnetic Resonance Imaging; Hb = Hemoglobin; EPO = Erythropoietin; B12 = Vitamin B12; IDA = Iron-Deficiency Anemia

DOCUMENTATION REMINDER IS COMPREHENSIVE CODING

Every SA encounter should document:
(**1**) **Subtype explicitly**: hereditary (**D64.0**), secondary to disease (**D64.1**), drug/toxin (**D64.2**), or other (**D64.3**); reclassify to **D46.1/D46.B** when MDS-RS is confirmed, **not just** "anemia",[4,6]
(**2**) **Diagnostic basis**: ring sideroblasts on marrow Prussian blue stain plus iron-study pattern (elevated ferritin and TSAT),[1,6]
(**3**) **Reversible cause status**: alcohol (**F10.10/F10.20**), copper deficiency (**E61.0**), B6 deficiency (**E53.1**), causative drug, or lead = **coded separately alongside SA**,[1,6]
(**4**) **Iron-overload status** (**E83.10–E83.19**) with ferritin trend, organ involvement, and chelation plan,[6,40]
(**5**) **Transfusion history**, **frequency**, and **functional hemoglobin target** (9–10 g/dL) with ESA or luspatercept status,[6,19]
(**6**) **Every comorbidity coded individually**: CKD (**N18.x**), cardiovascular disease (**I25.-/I50.-**), cognitive impairment (**F03.-/G30.-**), fall risk (**R29.6**),[6,43] and
(**7**) **Advance care planning and SDOH context** with Z-codes where present[6,44]

4 TREATMENT AND REFERRAL QUICK GUIDE

SA treatment is entirely **etiology-driven**: **there is no universal approach**.[4] Reversible causes (alcohol, drugs, copper/B6 deficiency) **are corrected first**; clonal MDS-RS is co-managed with hematology using **transfusion-minimizing therapy** and **iron-overload surveillance**.[4,6] For lower-risk MDS, **no therapy** has demonstrated an overall survival benefit in a randomized trial; the treatment goals are **symptom reduction**, **transfusion elimination**, and minimizing **iron-related organ damage**.[10]

AAVBC PERSPECTIVE

In value-based care, the PCP's highest-value contributions *center on early recognition of the* ***iron-overload pattern*** *(elevated ferritin and TSAT) that distinguishes SA from iron-deficiency anemia and* ***prevents harmful empiric iron****, screening for and removing reversible causes (alcohol, medications, nutritional deficiencies), serial iron-overload monitoring with ferritin and TSAT during transfusion therapy, and* ***coordinating hematology co-management*** *for luspatercept or ESA selection based on* ***EPO level*** *and* ***SF3B1 status****.*[4,6] *The* ***COMMANDS trial*** *demonstrated* ***luspatercept superiority*** *over epoetin alfa in* ***ESA-naive transfusion-dependent lower-risk MDS****, with* ***59%*** *vs.* ***31%*** *achieving transfusion independence ≥12 weeks (p <0.0001) and median duration of transfusion independence of* ***127*** *vs.* ***77 weeks****.*[45] *The* ***TELESTO trial*** *confirmed that* ***deferasirox*** *prolonged event-free survival by* ***approximately 1 year*** *versus placebo (3.9 vs. 3.0 years; HR 0.64) in* ***iron-overloaded lower-risk MDS****.*[46] *Decisions on treatment intensity and escalation are guided by* ***functional status****,* ***transfusion trajectory****,* ***iron-overload burden****, and* ***goals of care****, not chronological age alone.*[6,10]

Therapy Escalation Criteria

TRIGGER*[6,10,43,47]	ACTION*[6,40]
Anemia unresponsive to 2–3 months off offending agent or on pyridoxine	Bone marrow biopsy with **Prussian blue stain**; PCP initiates referral, **hematology performs**
Confirmed ring sideroblasts, blasts <5%, SF3B1 mutation	Classify as **MDS-RS** (**D46.1**); begin **transfusion-minimizing therapy** per NCCN; hematology co-management
Symptomatic anemia (MDS-SF3B1) despite supportive care; serum EPO ≤500 mU/mL	**Luspatercept** (category 1, preferred); **consider ESA** if EPO ≤200 mU/mL
Symptomatic anemia (MDS-SF3B1) despite supportive care; serum EPO >500 mU/mL	**Imetelstat** (other recommended; **ESA-ineligible**); luspatercept remains preferred
Luspatercept or ESA failure (no ≥1.5 g/dL Hb rise or no decrease in transfusion need by 3–6 months)	**Imetelstat** (category 1, preferred after luspatercept failure); ESA ± G-CSF (other recommended)
Ferritin >1,000 ng/mL in transfusion-dependent patient (>20–30 RBC units received)	Initiate **iron chelation discussion**: deferasirox (oral) or deferoxamine (SC); check CrCl → **contraindicated** if <40 mL/min
IPSS-R >3.5, rising blasts, or new pancytopenia	**Reclassify as higher-risk**; **HMA** (azacitidine preferred, category 1) ± venetoclax; evaluate allo-HCT candidacy in **fit patients**

TRIGGER*[6,10,43,47]	ACTION*[6,40]
Lower-risk MDS initially managed as lower risk but fails to respond	Move to **higher-risk management strategies** per NCCN

ABBREVIATIONS: SF3B1 = Splicing Factor 3b Subunit 1 Gene; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; NCCN = National Comprehensive Cancer Network; EPO = Erythropoietin; ESA = Erythropoiesis-Stimulating Agent; Hb = Hemoglobin; G-CSF = Granulocyte Colony-Stimulating Factor; RBC = Red Blood Cell; SC = Subcutaneous; CrCl = Creatinine Clearance; IPSS-R = Revised International Prognostic Scoring System; HMA = Hypomethylating Agent; allo-HCT = Allogeneic Hematopoietic Cell Transplantation; MDS = Myelodysplastic Syndrome; PCP = Primary Care Physician
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

NCCN MDS v3.2026 Guideline-Aligned Treatment by Subtype and Profile

PROFILE	GUIDELINE-ALIGNED APPROACH*[6,10,48]	NOTES*[1,4,6]
Reversible acquired SA (drug, toxin, alcohol, copper deficiency, B6 deficiency, lead)	**Remove the causative agent**; correct **copper** or **B6 deficiency**; co-administer pyridoxine 25–50 mg/day for isoniazid-related SA; **lead chelation** if indicated	**Usually reversible**; recheck **CBC at 3–6 months**; **do not give iron**
Hereditary X-linked SA (ALAS2)	**Pyridoxine 50–200 mg/day**; **~one-third** of **X-linked** patients respond; iron overload may suppress pyridoxine responsiveness → **phlebotomy** can restore response	Monitor for **peripheral neuropathy** at doses >200 mg/day; iron overload develops independently of transfusions due to **ineffective erythropoiesis**
Lower-risk MDS-SF3B1, symptomatic anemia	**Luspatercept** (NCCN category 1); 1 mg/kg SC q3wk, titrate to 1.75 mg/kg; or **ESA if EPO ≤200 mU/mL**	**COMMANDS**: **59%** vs **31%** RBC-TI ≥12 wk vs epoetin alfa; target Hb 10–12 g/dL, **not to exceed 12 g/dL**
Lower-risk MDS-RS after ESA failure, transfusion-dependent	**Imetelstat** 7.1 mg/kg IV q4wk; **requires**: platelets ≥75K and ANC ≥1,500	**Grade 3/4 thrombocytopenia** ~65%, neutropenia ~72%; cytopenias typically reversible; CBC weekly first 2 cycles
Transfusion-dependent with iron overload	**Iron chelation** when ferritin >2,500 ng/mL **after 20–30 RBC transfusions**; deferasirox (oral) preferred; **deferoxamine** if intolerant	Deferasirox **contraindicated eGFR <40 mL/min**; target ferritin <1,000 ng/mL; monthly creatinine and LFTs

PROFILE	GUIDELINE-ALIGNED APPROACH*[6,10,48]	NOTES*[1,4,6]
Higher-risk or frail-with-fit-physiology	**HMA** (azacitidine or decitabine); **allo-HCT in selected patients** up to ~age 75 per NCCN	**Geriatric assessment predicts treatment tolerance** and survival; **avoid HCT in frail elders**; shared decision-making essential

ABBREVIATIONS: SA = Sideroblastic Anemia; B6 = Vitamin B6; CBC = Complete Blood Count; ALAS2 = 5-Aminolevulinate Synthase 2 Gene; MDS-SF3B1 = Myelodysplastic Syndrome with SF3B1 Mutation; NCCN = National Comprehensive Cancer Network; SC = Subcutaneous; ESA = Erythropoiesis-Stimulating Agent; EPO = Erythropoietin; RBC-TI = Red Blood Cell Transfusion Independence; Hb = Hemoglobin; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; IV = Intravenous; ANC = Absolute Neutrophil Count; eGFR = Estimated Glomerular Filtration Rate; LFTs = Liver Function Tests; HMA = Hypomethylating Agent; allo-HCT = Allogeneic Hematopoietic Cell Transplantation
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Non-Pharmacologic Care and Supportive Interventions

INTERVENTION	TARGET/ RECOMMENDATION*[4,6,10]	NOTES[1,49,50]
Transfusion stewardship	Transfuse **minimum units** to relieve symptoms, not to an arbitrary hemoglobin threshold	Reduces **iron loading** and **infusion burden**; consider chelation **after 20–30 RBC transfusions**
Alcohol-cessation support	**Screen with SBIRT**; alcohol is a common **reversible cause** of ring sideroblasts	Ring sideroblasts may resolve within **3–6 months of abstinence**
Diet adjustment	Increase **B6-rich foods** (poultry, fish, potatoes, bananas, chickpeas) to **support RBC production**; eliminate alcohol; **limit red/organ meats**, iron-fortified cereals/breads/juices, and dark leafy greens in excess; avoid cast-iron cookware	B6 supports **pyridoxine-responsive forms**; dietary iron restriction complements chelation and slows organ damage
Supplement and medication review	**Identify high-dose zinc**, **B6-antagonist** drugs (isoniazid, linezolid), and Beers-flagged agents	Zinc-induced copper deficiency **mimics MDS and is reversible** with discontinuation and copper repletion
Fall-prevention and functional support	Anemia is a **modifiable fall-risk factor**; refer PT/OT as needed	Anemic older adults have **~2×** the risk of **recurrent falls**
Care coordination and SDOH screening	Transfusion-dependent patients need **transportation** and **caregiver coordination**	Assess caregiver capacity and health literacy at each visit; **consider home infusion**

INTERVENTION	TARGET/ RECOMMENDATION*[4,6,10]	NOTES[1,49,50]

ABBREVIATIONS: RBC = Red Blood Cell; SBIRT = Screening, Brief Intervention, and Referral to Treatment; B6 = Vitamin B6; MDS = Myelodysplastic Syndrome; PT = Physical Therapy; OT = Occupational Therapy; SDOH = Social Determinants of Health
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Medication Safety and Key Interactions

AGENT	KEY CONSIDERATIONS*[1,4,6,45]	PCP ACTION*[4]
Oral or IV iron	**Contraindicated** unless true concurrent iron deficiency confirmed; SA patients are **iron-overloaded**; **worsens organ injury**	Verify ferritin and TSAT **before prescribing**; withhold when elevated
Luspatercept (Reblozyl)	NCCN category 1 for **MDS-SF3B1**; **COMMANDS**: **59%** vs **31%** RBC-TI ≥12 wk vs epoetin alfa; AEs include **hypertension** and **thromboembolic events**	**Hematology-directed**; 1 mg/kg SC q3wk; BP monitoring; do not exceed Hb 12 g/dL
Imetelstat (Rytelo)	For **TD lower-risk MDS after ESA failure**; grade 3/4 thrombocytopenia 65%, neutropenia 72%; requires platelets ≥75K and ANC ≥1,500	**Hematology-directed**; CBC weekly first 2 cycles, then each cycle; hold for nadirs per label
Deferasirox (Jadenu)	**Boxed warning**: renal failure, hepatic failure, GI hemorrhage; contraindicated eGFR <40; dose reduce 50% if eGFR 40–60	**Monthly creatinine and LFTs**; annual auditory/ophthalmic exams; **initiate after 20–30 RBC transfusions**; target ferritin <1,000 ng/mL
Isoniazid	**Causative for SA via pyridoxine antagonism**; sideroblastic anemia is a labeled adverse reaction	Co-administer **pyridoxine 25–50 mg/day**; monitor CBC; resolves with discontinuation
Linezolid/ chloramphenicol	**Causative for SA via mitochondrial inhibition**; reversible	**Limit duration**; monitor CBC; switch agent if SA develops
High-dose zinc (OTC)	**Causative via copper depletion**; frequently **misdiagnosed as MDS**; **denture adhesive** is a common occult source	Check **serum copper** in unexplained SA; limit to RDA doses; recovery expected with **zinc cessation** and **copper repletion**

AGENT	KEY CONSIDERATIONS*[1,4,6,45]	PCP ACTION*[4]

ABBREVIATIONS: IV = Intravenous; SA = Sideroblastic Anemia; TSAT = Transferrin Saturation; MDS-SF3B1 = Myelodysplastic Syndrome with SF3B1 Mutation; NCCN = National Comprehensive Cancer Network; RBC-TI = Red Blood Cell Transfusion Independence; AEs = Adverse Events; SC = Subcutaneous; BP = Blood Pressure; Hb = Hemoglobin; TD = Transfusion-Dependent; MDS = Myelodysplastic Syndrome; ESA = Erythropoiesis-Stimulating Agent; ANC = Absolute Neutrophil Count; CBC = Complete Blood Count; eGFR = Estimated Glomerular Filtration Rate; GI = Gastrointestinal; LFTs = Liver Function Tests; RBC = Red Blood Cell; RDA = Recommended Dietary Allowance; OTC = Over-The-Counter; PCP = Primary Care Physician
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

CRITERION	SPECIALIST[6,10,51]	URGENCY[4,6,10]
Iron-overload-pattern anemia; reversible cause suspected (drug, alcohol, zinc, copper/B6 deficiency)	PCP manages initially	Routine
Anemia unresponsive to 2–3 month corrective trial	Hematology	Expedited
Suspected or confirmed MDS; new bicytopenia or pancytopenia	Hematology	Expedited
Higher-risk MDS; fit candidate for allogeneic HCT	Transplant/oncology	Expedited
Frail patient; goals favor comfort and function	Geriatrics/palliative care	Routine

ABBREVIATIONS: B6 = Vitamin B6; PCP = Primary Care Physician; MDS = Myelodysplastic Syndrome; HCT = Hematopoietic Cell Transplantation

Follow-Up Timing

CATEGORY	FREQUENCY*[4,6]	LABS/MONITORING*[4,6,10]
CBC with differential	**q3–6 months** when stable; **monthly during ESA** or luspatercept titration	**Hb <8 g/dL** with symptoms or **drop >2 g/dL in <2 weeks**: reassess urgently; target **Hb 10–12 g/dL**, not to exceed 12 g/dL
Serum ferritin	**q3–6 months** if transfusion-dependent; monthly during chelation	**>2,500 ng/mL**: **initiate chelation**; target <1,000 ng/mL; discuss chelation **after 20–30 RBC transfusions**

CATEGORY	FREQUENCY*[4,6]	LABS/MONITORING*[4,6,10]
Renal function (eGFR/ CMP)	**Baseline and monthly** on deferasirox; annually if not on chelation	**CrCl <40 mL/min**: **contraindication** to deferasirox; creatinine rise **>33%**: dose-reduce or hold
Serum EPO level	**Once at diagnosis**, **before** initiating ESA therapy	**>200 mU/mL**: low ESA response likelihood → prefer luspatercept; **>500 mU/mL**: ESAs **not recommended**
Peripheral smear	**At diagnosis** and with any clinical change	**Circulating blasts or new cytopenias**: urgent hematology referral; **≥20% blasts** = **AML** by WHO/ICC criteria

ABBREVIATIONS: CBC = Complete Blood Count; ESA = Erythropoiesis-Stimulating Agent; Hb = Hemoglobin; RBC = Red Blood Cell; eGFR = Estimated Glomerular Filtration Rate; CMP = Comprehensive Metabolic Panel; CrCl = Creatinine Clearance; EPO = Erythropoietin; WHO = World Health Organization; ICC = International Consensus Classification; AML = Acute Myeloid Leukemia
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Comorbidity Management

COMORBIDITY	PCP APPROACH*[4,6]	COORDINATION[6,40,52]
Iron overload (E83.10)	Track ferritin and TSAT q3–6 months; reinforce chelation adherence; **do not prescribe supplemental iron**	**Hematology sets chelation regimen**; **PCP monitors** renal and hepatic function on deferasirox
Cardiovascular disease	**Optimize BP and lipids**; recognize anemia-driven heart failure exacerbation; **transfuse for symptoms of**: active coronary disease, heart failure, or stroke	**Cardiology referral** for suspected iron-overload cardiomyopathy; **consider cardiac MRI T2*** if ferritin >2,500 ng/mL
Chronic kidney disease	**Use eGFR for drug dosing**; flag deferasirox contraindication (CrCl <40 mL/min); **monitor creatinine monthly during chelation**	**Nephrology** when CKD advances or ESA response is poor
Nutritional deficiency	**Check and correct copper and B6**; review zinc supplements, alcohol use, and post-surgical malabsorption	**Dietitian** for malabsorption or post-gastric-bypass status
Cognitive impairment/ frailty	**Simplify regimens**; involve caregivers; screen with **G-8** or **Clinical Frailty Scale**; assess fall risk	**Geriatrics** for comprehensive assessment; **social work** for transfusion logistics and SDOH

COMORBIDITY	PCP APPROACH*[4,6]	COORDINATION[6,40,52]

ABBREVIATIONS: TSAT = Transferrin Saturation; PCP = Primary Care Physician; BP = Blood Pressure; MRI = Magnetic Resonance Imaging; eGFR = Estimated Glomerular Filtration Rate; CrCl = Creatinine Clearance; CKD = Chronic Kidney Disease; ESA = Erythropoiesis-Stimulating Agent; B6 = Vitamin B6; SDOH = Social Determinants of Health
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Cost-Smart Options

BRAND (EST. COST)[6,53,54]	GENERIC/ALTERNATIVE (EST. COST)*[6,53–55]	EST. SAVINGS	COST-SMART TIP*[6,10,40]
Bone marrow biopsy as first step (~$1,500–$3,000 facility + pathology)	Rule out reversible causes first: copper, B6, medication, alcohol, lead labs (**~$50–$150**)	**~$1,350–$2,850**	Correctable causes can **resolve SA without invasive workup**; **cost-effective first step** before marrow referral
Luspatercept (Reblozyl) ~$4,000–$6,000/dose q3wk (~$5,500–$8,700/mo)	ESA biosimilar (epoetin alfa-epbx) **~$200–$600/mo**; darbepoetin alfa **~$1,500–$3,000/mo**	**Variable**; ESA is lower upfront cost	NCCN category 1 for **MDS-SF3B1**; **COMMANDS**: **59%** vs **31%** TI, median TI **127** vs **77 wk** vs epoetin alfa; higher upfront cost **offset by fewer transfusions** and longer response; ESA biosimilar reasonable when serum EPO ≤200 mU/mL
Imetelstat (Rytelo) ~$20,000–$25,000/mo (IV q4wk; provider-administered)	Luspatercept (if not previously used) **~$5,500–$8,700/mo**	**~$11,000–$20,000/mo**	Reserved for **TD lower-risk MDS after ESA failure**; Medicare Part B; **IMerge**: **40%** vs **15%** ≥8-wk TI; high myelosuppression rate; confirm prior therapies exhausted **before initiating**
Deferasirox brand (Jadenu) ~$3,000–$5,000/mo (weight-based; oral once daily)	**Generic** deferasirox **~$500–$1,500/mo**; deferoxamine SC **~$200–$500/mo** (requires 8–12 hr infusion)	**~$1,500–$4,500/mo** with generic	**Prescribe generic deferasirox specifically**; oral route preferred for adherence; **TELESTO**: EFS **3.9** vs **3.0** yr (HR 0.64); initiate **after 20–30 RBC transfusions** when ferritin >2,500 ng/mL; **monthly renal monitoring mandatory**

BRAND (EST. COST)[6,53,54]	GENERIC/ALTERNATIVE (EST. COST)*[6,53–55]	EST. SAVINGS	COST-SMART TIP*[6,10,40]
Chronic transfusion program ~$15,000–$30,000/yr (blood products + chelation + monitoring)	Transfusion-minimizing therapy (luspatercept or ESA) **~$5,000–$8,700/mo** drug cost	**Variable**: drug cost offset by fewer transfusions and chelation needs	Each RBC unit costs **~$215** acquisition + **~$1,024** activity-based cost; **transfusion-minimizing therapy reduces**: iron loading, infusion visits, and caregiver burden; transfuse **for symptoms**, not numbers
Standard infusion center visits (~$150–$300/visit transport + caregiver time)	**Home or mobile infusion** (where available)	**Variable**: reduces indirect costs	**Reduces transportation burden** for mobility-limited seniors; confirm plan coverage; particularly valuable for **TD patients requiring q2–4 wk visits**
Pyridoxine (vitamin B6) ~$5–$15/mo (OTC)	N/A: already lowest cost	N/A	**First-line for hereditary X-linked SA** (ALAS2); **~one-third** respond; also co-administer with isoniazid to **prevent drug-induced SA**; no cost barrier

ABBREVIATIONS: SA = Sideroblastic Anemia; B6 = Vitamin B6; MDS-SF3B1 = Myelodysplastic Syndrome with SF3B1 Mutation; ESA = Erythropoiesis-Stimulating Agent; EPO = Erythropoietin; TI = Transfusion Independence; TD = Transfusion-Dependent; MDS = Myelodysplastic Syndrome; IV = intravenous; SC = subcutaneous; EFS = Event-Free Survival; HR = Hazard Ratio; RBC = Red Blood Cell; ALAS2 = 5-Aminolevulinate Synthase 2 gene; OTC = Over-The-Counter; ED = Emergency Department
Estimated costs reflect approximate 2024–2025 US wholesale acquisition cost (WAC) or out-of-pocket ranges and do not account for insurance coverage, copay assistance, or negotiated rates
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Patient Education and Adherence

Patient and caregiver education centers on four messages:

- **Do not take iron supplements without explicit direction**: in sideroblastic anemia the body is already iron-overloaded, and extra iron damages the liver, heart, and endocrine organs. The iron-overload pattern (high ferritin and TSAT) is the inverse of iron deficiency[21,43]
- **Avoid dietary and environmental sources of excess iron**: Beyond supplements, patients should be aware of everyday iron sources that can **worsen overload**
- **High-iron foods**: Limit red meats (beef, lamb) and avoid organ meats (liver). Be mindful of portion sizes with dark, leafy greens
- **Iron-fortified foods**: Check nutrition labels on cereals, breads, and juices — many contain added iron that contributes to overload

- **Cooking equipment**: Do not cook with cast-iron skillets, as iron leaches into food during cooking
- **Alcoholic beverages**: Eliminate or severely restrict alcohol, which is directly toxic to bone marrow, worsens anemia, and can independently cause ring sideroblasts
- **Multivitamins**: Use only iron-free formulations; most over-the-counter multivitamins contain iron unless specifically labeled otherwise
- **Track and report symptoms**: worsening breathlessness, chest pain, new confusion, or jaundice warrant prompt evaluation. For transfusion-dependent patients, keep a simple transfusion log (date, units, symptoms before/after) to support coordination with hematology[6]
- **Chelation-specific counseling**: for patients on deferasirox, orange-brown urine color is expected, but visual or hearing changes should be reported promptly (auditory and ocular toxicity occurs in ~1% of patients). Monthly renal monitoring is mandatory[6]

Frame goals around what matters to the patient; hemoglobin targets serve function and independence, not the other way around.

DOCUMENTATION REMINDER - PATIENT EDUCATION

Document the following education topics, the patient and caregiver(s) present, materials provided, and patient understanding (**teach-back method**):

- **Iron avoidance counseling**: Document that the patient understands **not to take iron supplements**, multivitamins with iron, **lower dietary iron intake** (red and organ meats, avoid cast-iron cookware) or iron-fortified products without explicit hematology direction; explain that sideroblastic anemia causes **iron overload**, not iron deficiency, and that supplemental iron worsens organ damage[21]
- **Symptom warning signs**: Document counseling on signs **requiring urgent evaluation**: new or worsening dyspnea or chest pain (iron-overload cardiomyopathy, anemia-driven decompensation), **jaundice or dark urine beyond expected chelation effect** (hepatic iron toxicity), new confusion or neurologic changes (severe anemia or stroke), and fever in neutropenic patients[21]
- **Alcohol and reversible-cause counseling**: Document alcohol-cessation counseling if applicable (**SBIRT**); explain that alcohol, certain medications, and nutritional deficiencies can **cause or worsen ring sideroblasts** and that resolution may occur within 3–6 months of removing the cause[56]
- **Chelation adherence and monitoring**: Document counseling on **deferasirox administration** (take on empty stomach or with light meal), **expected urine color change**, importance of monthly lab monitoring, and need to report visual or hearing changes immediately; note any cost barriers or Part D coverage gaps discussed[6]
- **Transfusion log and coordination**: Document counseling on maintaining a **simple transfusion log**; review **transportation plan and caregiver capacity** for infusion visits; note any SDOH barriers identified and referrals made[6]
- **Advance care planning**: For patients with higher-risk MDS or significant frailty, document **goals-of-care discussion**, surrogate designation, and code status; billable as CPT 99497/99498 during AWV with no patient copay[47]

Quality Metrics Tie-In

No SA- or MDS-specific HEDIS or MIPS measures are currently active in MY2026. However, the combination of chronic anemia, polypharmacy (chelation, ESAs, luspatercept), frequent transfusion-related hospitalizations, depression risk, and reduced life expectancy in MDS means that **cross-cutting national measures apply across the entire SA/MDS care trajectory** and can **anchor quality reporting for any PCP managing these patients**.[6,10,43]

MEASURE	STANDARD	SA/MDS APPLICABILITY*[6,10,57,58]
HEDIS COA: Care for Older Adults-Medication Review	**Denominator**: MA enrollees ≥66, continuously enrolled; **Numerator**: sub-measures documented annually: (**1**) functional status assessment, (**2**) medication review, **Exclusions**: hospice, ESRD	SA/MDS patients are on **multiple interacting agents** (deferasirox, ESAs, luspatercept, imetelstat); documented review **should reconcile:** nephrotoxic drugs against renal function and flag iron supplements, Beers-listed agents, and zinc-containing products
HEDIS COA: Care for Older Adults-Functional Status Assessment	**Denominator**: enrollees ≥66 **Numerator**: functional status assessment documented annually **Exclusions**: hospice, ESRD	Chronic anemia is an **independent risk factor for**: falls, functional decline, and cognitive impairment; gait assessment and ADL/IADL screening **directly satisfy this sub-measure** and identify patients needing PT/OT referral
HEDIS TRC: Transitions of Care Patient	**Denominator:** enrollees ≥18 with inpatient discharge; **Numerator:** sub-measures within 30 days: (**1**) notification of inpatient admission, (**2**) receipt of discharge information, **Exclusions:** hospice	**Transfusion-dependent MDS patients have frequent admissions**; post-discharge medication reconciliation is critical given fluctuating renal dosing of chelation and ESA adjustments; **timely PCP follow-up reduces readmission risk**
HEDIS DMS-E: Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults	**Denominator:** enrollees ≥12 with diagnosis of major depression or dysthymia AND elevated PHQ-9 ≥10; **Numerator:** follow-up PHQ-9 documented within 4–8 months of index elevated score **Exclusions:** hospice	Depression is **common in chronic hematologic malignancies** and is associated with frailty and reduced treatment adherence; **PHQ-9 monitoring** supports both quality reporting and clinical management
HEDIS ACP: Advance Care Planning	**Denominator:** enrollees ≥66; **Numerator:** advance care plan or surrogate decision-maker documented, **OR** documentation that ACP was discussed but patient declined **Exclusions:** hospice	Higher-risk MDS has **median survival <3 years**; ACP should **begin at diagnosis**, not at end-of-life; transfusion-dependent patients face unique hospice barriers; billable as CPT 99497/99498 during AWV with no copay

MEASURE	STANDARD	SA/MDS APPLICABILITY*[6,10,57,58]
HEDIS PCR: Plan All-Cause Readmission	**Denominator:** enrollees ≥18 with acute inpatient discharge **Numerator:** unplanned readmission within 30 days (lower is better) **Exclusions:** planned readmissions (maintenance chemotherapy, transplant), hospice, psychiatric	Anemia at discharge is independently associated with **increased 30-day readmission** (4% increase per 1 g/dL decrease in discharge Hb); structured transitions of care and timely outpatient follow-up **reduce readmission risk**

ABBREVIATIONS: HEDIS = Healthcare Effectiveness Data and Information Set; COA = Care for Older Adults; MA = Medicare Advantage; ESRD = End-Stage Renal Disease; SA = Sideroblastic Anemia; MDS = Myelodysplastic Syndrome; ESA = Erythropoiesis-Stimulating Agent; ADL = Activities of Daily Living; IADL = Instrumental Activities of Daily Living; PT = Physical Therapy; OT = Occupational Therapy; TRC = Transitions of Care; PCP = Primary Care Provider; DMS-E = Depression Monitoring and Follow-Up; PHQ-9 = Patient Health Questionnaire-9; ACP = Advance Care Planning; CPT = Current Procedural Terminology; AWV = Annual Wellness Visit; PCR = Plan All-Cause Readmissions; Hb = Hemoglobin
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

ELEMENT[4,9,10,28]	DOCUMENTATION REQUIREMENT[6,40]
D64.0, Hereditary sideroblastic anemia	Document **congenital/X-linked etiology** (**ALAS2**); family history; genetic testing if available
D64.1, Secondary SA due to disease	Document and separately code the underlying disease driving the SA
D64.2, Secondary SA due to drugs and toxins	Name the **causative agent** (alcohol, isoniazid, linezolid, lead, zinc); code the cause separately
D64.3, Other sideroblastic anemias (incl. pyridoxine-responsive, NOS)	Use when etiology is **not hereditary or clearly secondary**; document pyridoxine response if tested
D46.1/D46.B, MDS with ring sideroblasts/with multilineage dysplasia	Use when marrow confirms **MDS-RS** per WHO-HAEM5/ICC 2022; record **SF3B1 status** and **IPSS-R score**
D64.9, AVOID: Anemia, unspecified	Specify the **SA subtype** once **ring sideroblasts are confirmed**

ELEMENT[4,9,10,28]	DOCUMENTATION REQUIREMENT[6,40]
E83.10–E83.19/E83.111, Iron overload/ transfusion-related hemochromatosis	**Code concurrently** when iron overload is documented; record **ferritin level** and **organ involvement** (cardiac, hepatic, endocrine)
Acuity and transfusion dependence	**Document**: transfusion frequency, units per 8-week period, and whether transfusion-dependent or -independent; supports treatment authorization
Avoid carrying forward resolved codes	**Reassess SA subtype at each visit**; do not copy an MDS code into a note when the **SA has resolved** (e.g., after removing a causative drug)

ABBREVIATIONS: SA = Sideroblastic Anemia; ALAS2 = 5-Aminolevulinate Synthase 2 gene; NOS = Not Otherwise Specified; MDS-RS = Myelodysplastic Syndrome with Ring Sideroblasts; WHO-HAEM5 = WHO Classification of Haematolymphoid Tumours 5th Edition; ICC = International Consensus Classification; SF3B1 = Splicing Factor 3b Subunit 1 gene; IPSS-R = Revised International Prognostic Scoring System; HCC = Hierarchical Condition Category; RAF = Risk Adjustment Factor; CNA = Community Non-Dual Eligible, Aged; V28 = CMS-HCC Version 28

Annual Clinical Review and Confirmation

- **Annual re-documentation**: Confirm the active SA subtype (**D64.0**, **D64.1**, or **D64.3**) yearly, referencing the original marrow finding and current iron-study pattern[6,10]
- **MEAT documentation**: CBC, iron studies, transfusion support, chelation adherence, and hematology co-management should be explicitly documented[6]
- **Coding transition points**: If marrow confirms MDS-RS, move from **D64.3** to **D46.1**/**D46.B** (MDS HCC, not HCC 109); drug/toxin-induced SA (**D64.2**) → code the **causative agent separately**[6,9]
- **Code supporting comorbidities**: Alcohol use disorder (**F10.20**), copper deficiency (**E61.0**), B6 deficiency (**E53.1**), lead toxicity (**T56.0-**), iron overload (**E83.10–E83.19**)[9]
- **Avoid rollover**: Do not copy forward prior codes **without reassessing**: SA subtype, iron studies, transfusion burden, and any SA-to-MDS transition

Good Documentation - EHR Tips

- **[EHR TIP — Smartphrase]** Build a **.sa_visit dot phrase** that **auto-populates**: **D64.x** subtype, marrow confirmation date, ferritin/TSAT trend, SF3B1 status, transfusion frequency, chelation regimen, and hematology co-management. Separate **.sa_reversible phrase** for new evaluations: alcohol screen, copper, B6, lead, medication review (isoniazid, linezolid, zinc), and denture adhesive check
- **[EHR TIP — Alert]** Flag **D64.9** (unspecified, no HCC) for subtype upgrade. Flag active deferasirox **without renal function in 3 months**. Flag ferritin >1,000 ng/mL without **E83.1x** on problem list. Flag no hematology visit in **12 months**

- **[EHR TIP — Best Practice]** Pin subtype-specific **D64.x** with marrow date (e.g., "Hereditary SA, D64.0, marrow 2023"), **not** "anemia." Fire alert **before ordering iron** when ferritin/TSAT indicate overload. Code comorbidities individually (**E83.1x**, **F10.20**, **E61.0**)
- **[EHR TIP — Order Set]** "**SA Annual Review**": CBC with differential, reticulocyte count, iron/ferritin/TSAT, CMP, copper, B6, peripheral smear. "**SA Iron Overload Monitoring:**" ferritin, hepatic panel, chelation adherence check, cardiac MRI T2 referral if **ferritin >2,500 ng/mL**

Brief Case Examples

SUCCESS: GENOTYPE-SPECIFIC CODING AT ANNUAL VISIT

SCENARIO

A 74-year-old male with three months of fatigue and exertional dyspnea; hemoglobin **8.9 g/dL**, **normal MCV**, no response to **two months of empiric oral iron**. **PMH**: CKD (eGFR 38), hypertension, longstanding moderate alcohol use.

Documentation: "**D46.1**: MDS with ring sideroblasts, **SF3B1-mutated** (marrow confirmed [date], Prussian blue stain positive); **IPSS-R lower-risk**. Iron studies: ferritin 920 ng/mL, TSAT 62% → iron-overload pattern, **oral iron stopped**. Luspatercept 1 mg/kg SC q3wk initiated with hematology. **F10.20**: Alcohol use disorder → SBIRT completed, cessation counseling documented. **N18.32**: CKD stage 3a (eGFR 38) → **deferasirox contraindicated** (CrCl <40). Ferritin surveillance q3mo. Functional hemoglobin target **9–10 g/dL**. Return 3 months or sooner for new symptoms."

Outcome: D46.1 (MDS HCC) + **F10.20** + **N18.32** mapped with **full clinical picture documented**. **Every MEAT element present**: marrow-confirmed diagnosis with mutation status, iron studies demonstrating overload, harmful iron stopped, disease-directed therapy initiated, reversible contributor addressed, **renal contraindication to chelation noted**, comorbidities individually coded, and follow-up interval with return criteria. **Transfusions minimized**; no avoidable ED visit over the following year.

PITFALL: INSUFFICIENT DOCUMENTATION

SCENARIO

A 74-year-old with fatigue and hemoglobin **8.9 g/dL**. **Normal MCV**. On empiric oral iron for two months without improvement. Iron studies not reviewed.

Documentation as written: "Anemia — continue iron. **D64.9**."

Consequence: (**1**) **D64.9** (anemia, unspecified) does not map to any HCC and **documented clinical complexity is not represented**; **HCC 109** (or MDS HCC, once confirmed) is lost for the year. (**2**) Empiric iron continued in an iron-overloaded patient (ferritin 920 ng/mL, TSAT 62%); **organ damage risk from progressive iron loading**. (**3**) Sideroblastic anemia not considered despite normal MCV and iron non-response; marrow **diagnosis of MDS-RS delayed by months** while symptoms and ferritin rose. (**4**) No reversible-cause workup, no iron-study review, no hematology referral. **No MEAT elements present** beyond a bare diagnosis label.

RAF Impact: D64.9 maps to no HCC. **HCC 109** (RAF 1.144 CNA) or the MDS HCC is lost entirely. **Auditable gap** if marrow later confirms a specific subtype.

Fix: Order full iron panel **before any iron prescription**; **withhold iron** when ferritin and TSAT are elevated; refer for marrow biopsy with **Prussian blue stain**; code the **specific subtype** (**D64.x** or **D46.1**) with supporting documentation. **Corrected documentation**: "**D46.1**: MDS with ring sideroblasts (marrow confirmed [date], **SF3B1** [status]). **Iron studies**: ferritin [value], TSAT [value]% → iron stopped. Luspatercept initiated with hematology. **Alcohol use**: [status]. **CKD**: eGFR [value] → chelation eligibility assessed. Ferritin surveillance q[interval]. Return [interval] or sooner for new symptoms." **Coding after fix**: **D46.1** (MDS HCC) replaces **D64.9** (no HCC) = diagnosis-specific coding with **full clinical picture preserved**.

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