AAVBC
AMERICAN ACADEMY OF VALUE BASED CARE

Sickle Cell Anemia

Quick Reference Guide

2026

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1 CLINICAL SNAPSHOT

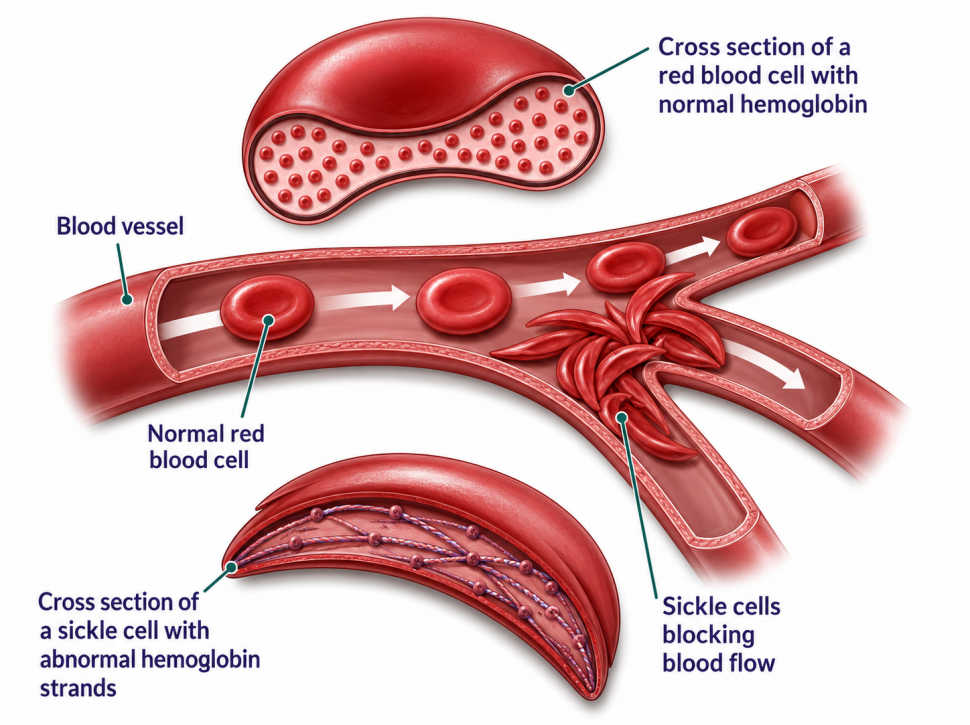
Definition: Sickle cell disease (**SCD**) is a group of inherited red blood cell disorders caused by autosomal-recessive mutations in the **HBB gene** that produce **abnormal hemoglobin S** (**HbS**).[1,2] Under deoxygenated conditions, **HbS polymerizes** into rigid rods that **distort red cells into a sickle shape**, reducing red cell lifespan from **120 days** to **10–20 days** and obstructing microvascular flow; this drives a cascade of vasculopathy, hemolytic anemia, acute pain crises, end-organ damage, and premature death.[1,2] SCD is a **spectrum of genotype-defined disorders**: **HbSS** (sickle cell anemia, most severe), **HbS/β^0-thalassemia** (functionally equivalent to HbSS), **HbSC** disease (generally milder but still causes significant complications), **HbS/β^+-thalassemia** (variable severity), and rare variants **HbSD**, **HbSE**, and **HbSO-Arab**.[2,3] **Sickle cell trait** (HbAS, one normal HBB allele) is a **carrier state, NOT active disease**.[3,4]

ICD-10 Codes:

D57.x designates sickle-cell disorders, categorized by genotype, crisis status, and specific complication.[5] Common codes: **D57.00** (HbSS with crisis, unspecified), **D57.01** (HbSS with acute chest syndrome (ACS) = **leading cause of SCD death**), **D57.02** (HbSS with splenic sequestration), **D57.03** (HbSS with cerebral vascular involvement), **D57.1** (sickle-cell disease without crisis; **genotype-nonspecific**), **D57.20** (HbSC without crisis), **D57.211** (HbSC with ACS), **D57.42** (HbS/β^0-thal without crisis), **D57.44** (HbS/β^+-thal without crisis), and **D57.3** (sickle-cell TRAIT; **carrier state only**). Complication codes paired alongside **D57**: **N18.x** (CKD), **I27.2x** (secondary pulmonary hypertension), **H35.x** (proliferative sickle retinopathy), **M87.x** (avascular necrosis), **F32.x** (depression).

Prevalence and Burden: SCD affects approximately **100,000 people** in the United States, predominantly **Black Americans** (**1 in 365** Black births) and **Hispanic Americans** (**1 in 16,300** Hispanic births).[6,7] More than 3 million Americans carry **sickle cell trait** (**D57.3**).[8] Life expectancy for publicly insured individuals with SCD is approximately **52.6 years**, roughly **20 years shorter** than the general population, meaning few patients historically survived to age 65.[2,9] **Hydroxyurea therapy**, infection prophylaxis, and comprehensive care are now extending survival, with median survival increasing from age 14 years in 1973 to **as high as 61 years** in recent academic center cohorts, creating a growing but heavily comorbid Medicare-age SCD population.[10,11] Adult Medicaid enrollees with SCD incur mean total costs of **$45,114/year** vs. **$6,039** for matched non-SCD adults (a 7.5-fold difference), driven primarily by hospitalizations (18.7-fold higher costs) and ED visits (12.7-fold higher costs).[12] Estimated lifetime medical costs reach **$1.6–$1.7 million** per patient.[12] Approximately **222,612 ED visits** per year are attributable to SCD nationally, three-fourths for **pain**.[13] Medicare-specific PMPY data for adults aged 65+ are **essentially absent**: the Medicaid figures are the best available proxy, though the Jiao et al. nationwide cohort study of 94,616 Medicare and Medicaid beneficiaries demonstrated **significant survival disparities by insurance type** even among those reaching age ≥65.[9,12]

Sickle Cell Disease: Abnormally Shaped RBCs with Impaired Oxygen Delivery and Vasculature Blockages



HCC/RAF V28 Mapping

ICD-10 CODE(S)[4]	HCC CATEGORY (V28)[14]	RAF (CNA)*[15]	DOCUMENTATION REQUIREMENT[3–5]
D57.00, D57.01, D57.02, D57.03, D57.04, D57.09 (HbSS with crisis subtypes)	**HCC 107** Sickle Cell Anemia (Hb-SS) and Thalassemia Beta Zero	0.457	Document **HbSS genotype explicitly + crisis type** (VOC, ACS, splenic sequestration, cerebrovascular event, dactylitis, or other specified crisis); **avoid D57.00** default when crisis type is documented
D57.1 (sickle-cell disease without crisis)	**HCC 107** Sickle Cell Anemia (Hb-SS) and Thalassemia Beta Zero	0.457	**AVOID**: **D57.1 specifies no genotype**; appropriate ONLY for HbSS or HbS/β^0-thal stable disease
D57.42, D57.431, D57.438 (HbS/β^0-thal)	**HCC 107** Sickle Cell Anemia (Hb-SS) and Thalassemia Beta Zero	0.457	Functionally equivalent to HbSS: document **'HbS/β^0-thalassemia' explicitly**; same management as HbSS
D57.20, D57.211, D57.219 (HbSC disease)	**HCC 108** Sickle Cell Disorders, Except Hb-SS/Beta Zero	0.146	Document '**HbSC disease**' or '**sickle-cell/Hb-C disease**' **explicitly**; genotype documentation is a critical, required coding action

ICD-10 CODE(S)[4]	HCC CATEGORY (V28)[14]	RAF (CNA)*[15]	DOCUMENTATION REQUIREMENT[3–5]
D57.44, D57.451 (HbS/β$^+$-thal)	**HCC 108** Sickle Cell Disorders, Except Hb-SS/Beta Zero	0.146	**Variable severity**; some HbA produced
D57.80, D57.811, D57.818 (other SCD — HbSD, HbSE, HbSO-Arab)	**HCC 108** Sickle Cell Disorders, Except Hb-SS/Beta Zero	0.146	Rare compound heterozygous states; document **specific variant when known**
D57.3 (sickle-cell TRAIT = HbAS carrier)	No HCC	N/A	**TRAP**: **D57.3** = **carrier state only**; one normal HBB allele; does NOT represent active disease; **NEVER** code D57.3 **as active SCD**

ABBREVIATIONS: ICD-10 = International Classification of Diseases, Tenth Revision; HCC = Hierarchical Condition Category; CMS-HCC V28 = Centers for Medicare & Medicaid Services Hierarchical Condition Category Model V28; RAF = Risk Adjustment Factor; CNA = Community Non-Dual Eligible, Aged; HbSS = homozygous sickle cell anemia; VOC = vaso-occlusive crisis; ACS = acute chest syndrome; SCD = sickle cell disease; HbSC = sickle/hemoglobin-C; HbAS = heterozygous carrier (trait); HBB = hemoglobin subunit beta gene; AVN = avascular necrosis; CKD = chronic kidney disease; PH = pulmonary hypertension

***RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model;[10] values vary across patient populations based on eligibility and care setting**

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[14,15]

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

SICKLE CELL DISEASE	NON HB-SS SICKLE CELL DISEASE
~$4.8K	**~$1.5K**
HCC 107 · RAF 0.457	HCC 108 · RAF 0.146

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 risk value illustrative at base rate ~$10,402/year; actual plan payment varies by county and contract year.

AAVBC PERSPECTIVE

***From the AAVBC's perspective**, value-based care in sickle cell disease requires a reorientation from **acute crisis response to proactive longitudinal management**, with explicit acknowledgment that standard SCD guidelines are built on pediatric and young adult evidence and **Medicare-specific data are essentially absent**.[10] Older adults have had little to no representation in clinical trials, and life expectancy for Medicare/Medicaid beneficiaries with SCD remains approximately **52.6 years**, with Medicare disability/ESRD coverage*

associated with significantly worse survival.[9]

PCPs in value-based contracts should ***initiate generic hydroxyurea at the first eligible encounter*** *rather than deferring to subspecialty referral.* ***Only ~23% of eligible adults*** *fill a hydroxyurea prescription, yet adherent use is associated with* ***~29% fewer hospitalizations****,* ***~25% fewer ED visits****, and* ***~40% shorter hospital stays****.*[2,12,16] *Hospitalization drives 70.5% of total costs among adult Medicaid enrollees at* ***$45,114/year*** *= the best available proxy absent Medicare-specific PMPY data.*[12]

Renal-adjusted dosing is critical in this population*: elderly patients are more sensitive to hydroxyurea due to age-related renal decline, and the FDA mandates a* ***50% dose reduction*** *when CrCl falls below 60 mL/min (AUC increases 64%). CKD affects ~30% of SCD patients, and PBPK modeling suggests graded reductions of ~10%, 25%, and 45% for mild, moderate, and severe impairment, respectively.*[17] *Baseline and serial eGFR monitoring must be embedded in* ***every care management protocol****. When acute vaso-occlusive crises do occur, care should be directed to* ***dedicated SCD infusion centers or day hospitals rather than EDs****: a multicenter prospective cohort study found infusion center treatment reduced hospital admission rates* ***from 37% to 9%*** *and cut time to first parenteral analgesic by* ***70 minutes****, at significantly lower per-visit cost.*[18]

Two distinct aging populations now exist*: long-term survivors with cumulative organ damage, and older adults with milder genotypes presenting with complications previously attributed to other diagnoses.*[19] *A common misconception is that any symptom in an SCD patient is attributable to SCD, delaying diagnosis of age-related comorbidities.*[19] ***PCPs must own preventive care****: cardiovascular/metabolic screening, cancer screening, bone density, pulmonary hypertension surveillance, and retinal examinations; care must be in coordination with hematology for* ***disease-modifying therapy****.*

2 RECOGNITION AND DIAGNOSIS

Universal newborn screening (**NBS**) for SCD has been implemented across all 50 states **since 2006**, identifying approximately **1,200 affected newborns annually** (4.9 per 10,000 live births), making SCD the fourth most prevalent condition detected through NBS nationally.[20,21] However, **no analogous population-wide screening program exists for adults**, and adults born before universal NBS, born outside the US, or lost to follow-up during the pediatric-to-adult transition may **lack genotype confirmation** or organ-specific baselines.[22,23] Unlike staged malignancies, **SCD has no formal staging system**; disease is classified **by genotype** (HbSS, HbSC, HbS/β^0-thal, HbS/β^+-thal), **current crisis status** (with/without crisis, and crisis subtype), and cumulative **end-organ complication burden**; these three documentation axes drive ICD-10 code specificity.[2] The **Sickle Cell Outcomes Grading System** (**SCOGS**), published in 2026,[24] is the first **consensus-driven severity classification**, grading 53 SCD outcomes on a 1–5 scale modeled on CTCAE; it is **not yet validated for clinical use** but represents **a potential future standard** for severity benchmarking.

The NASCC 2025 consensus standards recommend a structured **annual comprehensive SCD visit** throughout the lifespan, and for Medicare-age beneficiaries, the **Annual Wellness Visit** (**AWV**) provides a natural platform to integrate **SCD-specific surveillance** (renal function,

echocardiography, depression screening, advance care planning) with standard preventive services at no patient copay.[23]

Medicare Part B Covered Screenings and Workup(Adult and Geriatric)

TEST[3,5,23]	FREQUENCY[3,5,23]	CPT/HCPCS	CLINICAL INDICATION*[3,5,23]
Hemoglobin electrophoresis or HPLC (diagnostic)	**Once at diagnosis**; repeat if records unavailable	83020/83021	**Confirms SCD genotype** (HbSS, HbSC, HbS/β^0-thal, HbS/β^+-thal); **essential before** any genotype-specific coding
CBC with differential, reticulocyte count, platelets	**Every 2–4 weeks** during hydroxyurea titration; **every 2–3 months** stable	85025/85045	**Baseline hematologic profile**; hydroxyurea monitoring; reticulocyte response marker
Comprehensive metabolic panel + cystatin C-based GFR	**Every 1–2 months** (elderly with CKD); **every 3–6 months** stable	80053/82610	Renal function critical for **hydroxyurea dosing**: 50% dose reduction required if **CrCl <60 mL/min**; cystatin C preferred (creatinine overestimates GFR in SCD)
Urinalysis with microalbumin/albumin-creatinine ratio	**Annually**	82043/81000	CKD prevalence **~47%** in adult SCD; microalbuminuria >30 mg/g triggers ACE inhibitor/ARB initiation
Transthoracic echocardiogram with TRV	**Annually** (NASCC 2025 standard)	93306	**PH screening**: TRV ≥2.5 m/s elevated mortality risk; PH is strongest independent mortality predictor in SCD
PHQ-2/PHQ-9 depression screening†	**Annually**	G0444/96127	Depression prevalence **~51.3%** in adults with SCD
Dilated ophthalmologic exam	**Annually** from age 10, lifelong	92014	**Proliferative sickle retinopathy** more common in HbSC than HbSS; **laser photocoagulation indicated** for proliferative changes
Pneumococcal, meningococcal, influenza, Hib vaccination	Per CDC adult schedule	90670/90733/90686/90648	Functional asplenia from **repeated splenic infarction**; essential against encapsulated organisms (*S. pneumoniae*, *H. influenzae*)

TEST[3,5,23]	FREQUENCY[3,5,23]	CPT/HCPCS	CLINICAL INDICATION*[3,5,23]
Serum ferritin + liver iron MRI (transfused patients)‡	**Annually**	82728/74183	**Iron overload monitoring**; **chelation indicated** when ferritin >1,000 ng/mL
Advance Care Planning (AWV)†	**Annually** + when goals change	99497/99498	Document directives, surrogate, code status; particularly important for elderly survivors with **accumulating end-organ damage**

ABBREVIATIONS: CPT = Current Procedural Terminology; HCPCS = Healthcare Common Procedure Coding System; SCD = sickle cell disease; HbSS = homozygous sickle cell anemia; HbSC = sickle/hemoglobin-C; CBC = complete blood count; GFR = glomerular filtration rate; CKD = chronic kidney disease; CrCl = creatinine clearance; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; TRV = tricuspid regurgitant jet velocity; NASCC = National Alliance of Sickle Cell Centers; PH = pulmonary hypertension; PHQ = Patient Health Questionnaire; Hib = Haemophilus influenzae type b; CDC = Centers for Disease Control and Prevention; HPLC = high-performance liquid chromatography; MRI = magnetic resonance imaging; AWV = Annual Wellness Visit
All tests are covered under Medicare Part B when medically necessary
† No patient copay when performed during the Annual Wellness Visit (AWV)
‡ Covered when medically necessary (i.e., patients receiving chronic transfusion therapy)
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Sickle Cell Disease Genotypes Influence Complication Risks and Disease Severity

GENOTYPE	HB (G/DL)	HBS (%)	HBA (%)	TYPICAL SEVERITY
AS (sickle cell trait)	Normal	≤40	>60	Normal
SS (sickle cell anemia)	6-9	>90	0	**Severe**
Sβ0 thalassemia (sickle cell anemia)	7-9	>80	0	**Severe**
Sβ+ thalassemia	9-12	>60	10-30	Less severe
SC	9-14	50	0	Less severe

ABBREVIATIONS: Hb= hemoglobin; HbA = hemoglobin A Table Adapted from National Heart, Lung, and Blood Institute 2014 guidelines

Subtle Early Signs in Older Adults (>65)

SIGN/ SYMPTOM[1,2,5,19,25,26]	CLINICAL SIGNIFICANCE[1,2,5,19,25,26]
Persistent musculoskeletal or chest pain in a person with known SCD	**Vaso-occlusive crisis** (**VOC**) often documented as 'back pain' or 'leg pain' rather than as a formal VOC diagnosis; do **NOT** assume pain is **non-SCD-related** in a patient with **documented SCD**
New pulmonary infiltrate + fever ≥38.5°C or hypoxia	**Acute chest syndrome** (ACS, **D57.01** for HbSS/**D57.211** for HbSC) = leading cause of SCD death; most common reason for ICU admission; requires emergent exchange transfusion + antibiotics
Sudden focal neurologic deficit (hemiparesis, aphasia, seizure)	**Acute stroke**: silent cerebral infarcts present in up to 39% of adults with SCD; both ischemic and hemorrhagic stroke occur; emergent exchange transfusion to reduce HbS <30%
Acute splenomegaly + hemoglobin drop ≥2 g/dL from baseline	**Splenic sequestration** (**D57.02** for HbSS); risk of **hypovolemic shock**; most common in children but can recur in adults without prior splenic infarction
Fever in a patient with functional asplenia	Functional asplenia from **repeated splenic infarction** begins in early childhood; fever ≥38.5°C with tachycardia or hypotension is a **sepsis emergency** from encapsulated organisms (*S. pneumoniae*, *H. influenzae*)
Priapism lasting >2 hours in an adult with SCD	**Urologic emergency**; risk of **permanent erectile dysfunction**; **D57.09** (HbSS with other specified crisis); requires same-day urology
Bone pain at hip or shoulder, worse with weight-bearing	**Avascular necrosis** (AVN, **M87.x**) is common in adults with SCD; results from **vascular occlusion at epiphysis**; prevalence increases with age
Insidious dyspnea with exertion or fatigue	**Pulmonary hypertension** (~10% prevalence; strongest independent mortality predictor); annual echocardiography with TRV: TRV **≥2.5 m/s** is a screening marker
Visual changes (floaters, flashes, sudden visual loss)	Proliferative sickle retinopathy → **vitreous hemorrhage**; more common in HbSC than HbSS; requires same-day ophthalmology
Aplastic crisis: sudden severe anemia with reticulocytopenia	Sudden Hb drop **>3 g/dL** with reticulocyte count near zero = often **parvovirus B19**; may require emergent transfusion

ABBREVIATIONS: SCD = sickle cell disease; VOC = vaso-occlusive crisis; ACS = acute chest syndrome; HbSS = homozygous sickle cell anemia; HbSC = sickle/hemoglobin-C; ICU = intensive care unit; HbS = hemoglobin S; Hb = hemoglobin; AVN = avascular necrosis; TRV = tricuspid regurgitant jet velocity; PH = pulmonary hypertension

Adult Sickle Cell Disease: Lifespan Complications and Transition Risks

FACTOR	RISK SIGNAL	NOTES*
HbSS or HbS/β^0-thalassemia genotype	**Strongest predictor** of disease severity and lifetime VOC frequency; HbSS prevalence **~50%** by age 33 for AVN of the femoral head[5,19]	Document genotype explicitly **at every encounter**
Chronic kidney disease (~25–47% prevalence in adults)	**Up to 12%** progress to ESRD; time-to-death from ESRD ~4 years **despite dialysis**; microalbuminuria present in ~33% of adults[1]	**Cystatin C-based GFR preferred** (creatinine overestimates GFR in SCD); ACEi/ARB for microalbuminuria >30 mg/g; 50% hydroxyurea dose reduction if CrCl **<60 mL/min***
Pulmonary hypertension (6–11% by RHC; TRV ≥2.5 m/s in ~30% of adults)	TRV ≥2.5 m/s associated with **4.4–10.6x** mortality risk ratio; cardiopulmonary disease responsible for **45%** of adult SCD deaths[27,28]	**Annual echocardiography**; sildenafil shows harm in SCD-PH = **AVOID**; expedited hematology/cardiology referral when TRV **≥2.5 m/s**
Mood Disorders	**2.6x** greater odds of mood disorder vs. those without medical conditions[29,30]	**Annual PHQ-2/PHQ-9**; behavioral health integration; screen for stigma-related care avoidance
Relative hypertension	**BP values ≥120/70 mmHg** increase risk of stroke and mortality despite being "normal" in the general population; SCD patients have significantly lower baseline BP[5,31]	**ACE inhibitors** preferred given dual renal benefit; standard antihypertensive thresholds may require adjustment
Iron overload (chronically transfused patients)	**Ferritin >1,000 ng/mL** or significant liver iron associated with organ damage; no physiologic mechanism to excrete excess iron[1,2]	**Annual ferritin** + liver iron MRI; chelation (deferasirox, deferoxamine, or deferiprone) when indicated*
Functional asplenia	Repeated splenic infarction → dramatically increased risk of **encapsulated organism bacteremia** (*S. pneumoniae*, *H. influenzae*)[1,2]	Verify pneumococcal/meningococcal/Hib vaccination **at every encounter**; fever ≥38.5°C = **emergency**
Polypharmacy + age-related renal decline	Hydroxyurea AUC **64% higher** when **CrCl <60** vs. >60 mL/min; elderly patients more sensitive to myelosuppressive effects*[19,32]	Mandatory 50% dose reduction at **CrCl <60 mL/min** (7.5 mg/kg/day);* monthly–bimonthly renal checks; medication reconciliation each visit

FACTOR	RISK SIGNAL	NOTES*
Avascular necrosis (femoral head, shoulder)	Prevalence **~10%** overall, **up to 50%** in HbSS by age 33; **~22%** in population-based California cohort; major source of chronic pain[5]	**Orthopedic evaluation**; arthroplasty at median age 36 when functional impairment significant; physical therapy
Retinopathy (more common in HbSC)	Sickle retinopathy occurs in **nearly all adults**; proliferative changes → vitreous hemorrhage → vision loss[1,5]	Annual dilated **ophthalmologic exam** from age 10, lifelong; laser photocoagulation for proliferative changes
Healthcare-system distrust/ prior stigma	Perceived discrimination associated with **53%** greater likelihood of **nonadherence** to physician recommendations; trust mediates 50% of this effect[32]	Document SDoH with Z-codes (**Z59.xx**, **Z59.41**); staff training on SCD-specific bias
Falling out of care during young-adult transition	Mortality rates peak in ages **18–30**; ST3P-UP QI Collaborative improved transition process measures by **402%** across 14 sites[22,33]	NASCC 2025 successful transfer = **≥2 adult visits** in first year post-transfer; **structured transition education** beginning at age 12

ABBREVIATIONS: VOC = vaso-occlusive crisis; HbSS = homozygous sickle cell anemia; AVN = avascular necrosis; GFR = glomerular filtration rate; SCD = sickle cell disease; ACEi = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; CrCl = creatinine clearance; RHC = right heart catheterization; TRV = tricuspid regurgitant jet velocity; PH = pulmonary hypertension; PHQ = Patient Health Questionnaire; BP = blood pressure; MRI = magnetic resonance imaging; Hib = Haemophilus influenzae type b; AUC = area under the curve; HbSC = sickle/hemoglobin-C; SDoH = social determinants of health; QI = quality improvement; NASCC = National Alliance of Sickle Cell Centers; ESRD = end-stage renal disease; ST3P-UP = Sickle Cell Trevor Thompson Transition Project
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Diagnosis, Classification, and Diagnostic Thresholds

TEST/MARKER[2,5,23,31]	DIAGNOSTIC CRITERION*[5,28,31,34]	NOTES[2,23,25,35]
Hemoglobin electrophoresis or HPLC	**Confirms SCD genotype**; HbSS shows HbS only; HbSC shows HbS + HbC; HbS/β-thal shows HbS + variable HbA	Newborn screening **identifies most US patients**; adults presenting without diagnosis with unexplained severe atraumatic pain or normocytic anemia with hemolysis **should be tested**
Vaso-occlusive crisis (VOC)	Acute pain **consistent with SCD pathophysiology** = not a diagnosis of exclusion	**Document VOC explicitly**; do **NOT** label as 'back pain' or 'leg pain' alone → documentation fails both clinical accuracy and HCC mapping

TEST/MARKER[2,5,23,31]	DIAGNOSTIC CRITERION*[5,28,31,34]	NOTES[2,23,25,35]
Acute chest syndrome (ACS)	**New pulmonary infiltrate on CXR + any of**: fever ≥38.5°C, respiratory symptoms, or hypoxia (SpO_2 <95%)	**Leading cause of SCD death**; emergent → exchange transfusion, antibiotics, supplemental O_2; **D57.01** for HbSS/ **D57.211** for HbSC
Splenic sequestration	Acute splenomegaly + hemoglobin drop ≥2 g/dL from baseline + tachycardia/ hypotension	**Risk of hypovolemic shock**; **D57.02** for HbSS; more common in children but can recur in adults without prior splenic infarction
TRV ≥2.5 m/s on echocardiography	Screening marker for **pulmonary hypertension**; definitive diagnosis requires right heart catheterization	TRV ≥2.5 m/s = **elevated mortality risk** (10x increase vs. <2.5 m/s); 6-year mortality 37% vs. 17%
Microalbuminuria >30 mg/g	ACE inhibitor/ARB initiation threshold	Higher threshold (>300 mg/g) triggers **nephrology referral** for sickle nephropathy
eGFR <60 mL/min (cystatin C-based)	**Defines CKD stage 3+**; triggers mandatory 50% hydroxyurea dose reduction	Tubular creatinine secretion overestimates true GFR in SCD; **cystatin C-based equations preferred**
Hb <4.5 g/dL OR ANC <2,000/µL OR platelets <80,000/µL	**Hydroxyurea myelosuppression** → hold dose; recovery typically within 15 days; resume at 5 mg/kg/ day lower	**Monitor reticulocytes also**; hold if <80,000 when Hb <9 g/dL
NASCC 2025 Annual Comprehensive Visit standard	**Annual SCD-specific visit** with organ-specific screening per consensus	Payers must recognize this as **standard of care**; PCP coordinates with SCD center or functions as embedded SCD medical home
Sickle Cell Outcomes Grading System (SCOGS; 2026)	**Delphi-based severity classification mapping 51 SCD outcomes** to 1–5 grading scale (modeled on CTCAE)	**Not yet validated for clinical use**; first SCD-specific severity classification system
Hemoglobin S level (chronic transfusion)	**Maintain HbS <30%** for secondary stroke prevention or severe complication management	Goal for chronic transfusion therapy in indicated patients

TEST/MARKER[2,5,23,31]	DIAGNOSTIC CRITERION*[5,28,31,34]	NOTES[2,23,25,35]

ABBREVIATIONS: HPLC = high-performance liquid chromatography; SCD = sickle cell disease; HbSS = homozygous sickle cell anemia; HbSC = sickle/hemoglobin-C; HbS = hemoglobin S; HCC = Hierarchical Condition Category; VOC = vaso-occlusive crisis; ACS = acute chest syndrome; CXR = chest X-ray; SpO_2 = peripheral oxygen saturation; Hb = hemoglobin; TRV = tricuspid regurgitant jet velocity; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; eGFR = estimated glomerular filtration rate; CKD = chronic kidney disease; ANC = absolute neutrophil count; NASCC = National Alliance of Sickle Cell Centers; PCP = primary care provider; SCOGS = Sickle Cell Outcomes Grading System; CTCAE = Common Terminology Criteria for Adverse Events
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Clues to Dig Deeper

CLINICAL CLUE[2,5,23]	WHY IT MATTERS[28,36]	NEXT DIAGNOSTIC STEP[5,31,37]
'Back pain' or 'leg pain' in patient with known SCD	**VOC frequently documented as a symptom** rather than a formal SCD complication = fails both clinical accuracy and HCC mapping	**Document VOC explicitly**; assess for ACS, stroke, splenic sequestration before assuming uncomplicated VOC
Adult with SCD never assessed for genotype	**D57.1** (genotype-nonspecific) default → obscures true disease burden	Order hemoglobin electrophoresis or HPLC; **document specific genotype** at every subsequent encounter
New exertional dyspnea in adult with SCD	**PH is the strongest independent SCD mortality predictor**; cardiopulmonary disease causes **~45%** of adult SCD deaths	Echocardiogram with TRV; if ≥2.5 m/s → **expedited hematology/PH specialist**; do **NOT** prescribe sildenafil (harm in SCD-PH)
Low mood or fatigue in adult with SCD on chronic pain regimen	Depression prevalence **~51%**; independent mortality predictor; often masked by chronic pain framing	**PHQ-9 screening**; integrate behavioral health into medical home; assess for stigma-related care avoidance
New microalbuminuria or eGFR decline	**Sickle nephropathy underdiagnosed**; CKD prevalence **~47%** in elderly SCD	**Cystatin C-based GFR**; ACE/ARB for albuminuria >30 mg/g; nephrology referral >300 mg/g; reassess hydroxyurea dose
Recurrent ED visits for pain	~222,612 SCD ED visits/year nationally, **three-fourths for pain**; may reflect unmet hydroxyurea adherence **or** inadequate pain plan	**Review hydroxyurea adherence and dose**; consider **mHealth or CHW program**;[38,39] refer to outpatient infusion center for VOC

CLINICAL CLUE[2,5,23]	WHY IT MATTERS[28,36]	NEXT DIAGNOSTIC STEP[5,31,37]
Adult with SCD never offered hydroxyurea	Only **~23%** of adults with ≥3 crises/year fill a hydroxyurea prescription; only **20.9%** are adherent	**Initiate hydroxyurea**; titrate to mild myelosuppression; discuss adherence supports
Young adult with SCD newly entering Medicare with no adult SCD care	Mortality peaks ages **18–30**; 'falling out of care' drives super-utilizer patterns	**Refer to adult SCD center**; ensure **≥2 adult visits in first year** per NASCC 2025 transition standard

ABBREVIATIONS: SCD = sickle cell disease; VOC = vaso-occlusive crisis; HCC = Hierarchical Condition Category; ACS = acute chest syndrome; HPLC = high-performance liquid chromatography; PH = pulmonary hypertension; TRV = tricuspid regurgitant jet velocity; PHQ = Patient Health Questionnaire; eGFR = estimated glomerular filtration rate; CKD = chronic kidney disease; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; ED = emergency department; CHW = community health worker; NASCC = National Alliance of Sickle Cell Centers

Common Oversights

OVERSIGHT/ SHORTCUT[2,5,23,36]	WHY IT MATTERS — WHAT TO DO INSTEAD*[18,28,31]
Treating SCD only at crisis — not as the medical home	**PCP should function as the SCD medical home**: annual screening, hydroxyurea optimization, comorbidity management, and multidisciplinary coordination = **not deferring entirely to hematology**
Not initiating or optimizing hydroxyurea for eligible patients	Only **~23%** of adults with ≥3 crises/year fill a hydroxyurea prescription; adherent patients have **52% fewer VOCs**, **30% fewer hospitalizations**, **20% lower total costs**
Prescribing standard 15 mg/kg/day hydroxyurea in elderly with CKD	FDA-mandated **50% dose reduction** (7.5 mg/kg/day) when **CrCl <60 mL/min**; AUC increases 64% in renal impairment; CKD prevalence ~47% in adult SCD
Prescribing sildenafil for SCD-related pulmonary hypertension	**Sildenafil shows HARM in SCD-PH**; hydroxyurea and chronic transfusion are primary disease-modifying approaches; **hematology/PH specialist referral essential**
Presenting voxelotor (Oxbryta) as a treatment option	Voluntarily **withdrawn from U.S. market** September 2024 due to imbalance in VOC events and fatal events; **do NOT prescribe**
Presenting gene therapy/ HSCT without elderly-specific qualification	Casgevy, Lyfgenia, and allogeneic HSCT require **myeloablative conditioning**; generally **NOT appropriate for patients ≥65**; evidence in elderly absent; always qualify when discussing curative options

OVERSIGHT/ SHORTCUT[2,5,23,36]	WHY IT MATTERS — WHAT TO DO INSTEAD*[18,28,31]
Sending VOC patients to the ED rather than the infusion center	**Multicenter RCT (1,441 visits)**: 9% vs. 37% admission rates; faster opioid initiation (62 vs. 132 min); shifting care from ED to ambulatory is the **highest-value VBC strategy**

ABBREVIATIONS: RAF = Risk Adjustment Factor; HbSC = sickle/hemoglobin-C; SCD = sickle cell disease; HCC = Hierarchical Condition Category; HBB = hemoglobin subunit beta; VOC = vaso-occlusive crisis; PCP = primary care provider; CKD = chronic kidney disease; CrCl = creatinine clearance; AUC = area under the curve; PH = pulmonary hypertension; HSCT = hematopoietic stem cell transplantation; AVN = avascular necrosis; ED = emergency department; RCT = randomized controlled trial; VBC = value-based care
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Key Differentials in Elderly

PRESENTATION	DIFFERENTIAL[2,5,28,31]	KEY TESTS[5,25,28,31]
Acute severe pain in patient with known SCD	**VOC** (most common); **ACS**; **splenic sequestration**; AVN flare; pigment cholelithiasis; non-SCD cause	SpO_2 + CXR **if chest involvement**; CBC with reticulocytes; LFTs if RUQ pain; abdominal imaging if splenomegaly
New dyspnea or hypoxia	**ACS** (**D57.01/D57.211**); pulmonary embolism; PH decompensation; pneumonia (**encapsulated organisms** → functional asplenia)	**CXR** (priority); CT-PE if suspected; echocardiogram with TRV; blood cultures if febrile
Sudden focal neurologic deficit	**Ischemic stroke**; intracerebral hemorrhage; silent cerebral infarct; seizure	**Emergent CT head** → MRI; exchange transfusion to HbS <30%; ICU admission
Acute splenomegaly + Hb drop	**Splenic sequestration** (**D57.02**); aplastic crisis (**parvovirus B19**); acute hemolytic crisis	**CBC + reticulocytes**; abdominal ultrasound; parvovirus B19 serology if reticulocytopenia
Bone pain at hip/ shoulder, weight-bearing	**AVN** (**M87.x**); VOC at that site; septic arthritis (functional asplenia risk)	Plain radiograph → MRI if normal but suspicion persists; **orthopedic referral**
New microalbuminuria or eGFR decline	**Sickle nephropathy**; hypertensive nephrosclerosis; diabetic nephropathy if comorbid	**Cystatin C GFR**; microalbumin/Cr ratio; nephrology if >300 mg/g; reassess hydroxyurea dose
Visual changes (HbSC > HbSS)	**Proliferative sickle retinopathy**; vitreous hemorrhage; central retinal artery occlusion	**Same-day dilated ophthalmologic exam**; laser photocoagulation if proliferative

PRESENTATION	DIFFERENTIAL[2,5,28,31]	KEY TESTS[5,25,28,31]
Cyclical fatigue in adult with SCD	**Depression** (**~51%** prevalence); chronic anemia; CKD; iron overload (transfused); thyroid disease	**PHQ-9**; CBC; ferritin; TSH; cystatin C GFR

ABBREVIATIONS: SCD = sickle cell disease; VOC = vaso-occlusive crisis; ACS = acute chest syndrome; AVN = avascular necrosis; HbSS = homozygous sickle cell anemia; HbSC = sickle/hemoglobin-C; SpO_2 = peripheral oxygen saturation; CXR = chest X-ray; CBC = complete blood count; LFTs = liver function tests; RUQ = right upper quadrant; CT-PE = computed tomography pulmonary embolism protocol; PH = pulmonary hypertension; TRV = tricuspid regurgitant jet velocity; Hb = hemoglobin; HbS = hemoglobin S; ICU = intensive care unit; eGFR = estimated glomerular filtration rate; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; CKD = chronic kidney disease; PHQ = Patient Health Questionnaire; TSH = thyroid-stimulating hormone

Comorbidity Screening

CONDITION	PREVALENCE/ ASSOCIATION[2,28,30,31]	SCREENING APPROACH[5,23,31]
Chronic kidney disease (N18.x)	**~47%** prevalence in adults; **~33%** microalbuminuria; **up to 12%** progress to ESRD	**Annual cystatin C GFR + microalbumin**; ACE/ARB if >30 mg/g; nephrology if >300 mg/g; 50% hydroxyurea reduction if CrCl <60
Pulmonary hypertension (I27.2x)	**~10%** prevalence; strongest independent mortality predictor; **45%** of adult SCD deaths are cardiopulmonary	**Annual echocardiogram with TRV**; ≥2.5 m/s → hematology/PH specialist; **AVOID sildenafil** (harm in SCD-PH)
Depression (F32.x/ F33.x)	**~51%** prevalence; independent mortality predictor (HR >3)	**Annual PHQ-9**; behavioral health integration in medical home
Hypertension (I10)	**~66% prevalence**; 'relative hypertension' at **lower absolute BP**; elevated systolic → stroke risk	**BP every visit**; ACE inhibitor preferred (dual renal benefit); **SCD-specific adjusted targets**
Iron overload (E83.110)	Independent mortality predictor in chronically transfused patients	**Annual ferritin + liver iron MRI**; chelation when ferritin >1,000 ng/mL
Avascular necrosis (M87.x)	**Common in adults**; femoral head most affected; prevalence increases with age	X-ray/MRI for hip/shoulder pain; **orthopedic referral** when functionally significant
Proliferative sickle retinopathy (H35.x)	**More common in HbSC than HbSS**; vitreous hemorrhage risk	Annual dilated exam from age 10, lifelong; laser for proliferative changes
Functional asplenia	Repeated splenic infarction → **encapsulated organism bacteremia risk**	Pneumococcal/meningococcal/Hib per CDC schedule; fever = **sepsis emergency**

CONDITION	PREVALENCE/ ASSOCIATION[2,28,30,31]	SCREENING APPROACH[5,23,31]
Stroke/silent cerebral infarct	**~11%** stroke by age 20 (HbSS); silent infarcts in **up to 39%** of adults	Brain MRI for neurologic symptoms or cognitive changes; chronic transfusion for secondary prevention
Cognitive impairment/ADHD	**Underdiagnosed long-term sequelae**; functional impact recognized	**Cognitive screening**; coordinate with neurology/behavioral health

ABBREVIATIONS: CKD = chronic kidney disease; ESRD = end-stage renal disease; GFR = glomerular filtration rate; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; CrCl = creatinine clearance; PH = pulmonary hypertension; SCD = sickle cell disease; TRV = tricuspid regurgitant jet velocity; HR = hazard ratio; PHQ = Patient Health Questionnaire; BP = blood pressure; MRI = magnetic resonance imaging; HbSC = sickle/hemoglobin-C; HbSS = homozygous sickle cell anemia; Hib = Haemophilus influenzae type b; ADHD = attention-deficit/hyperactivity disorder

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

These emergency conditions require **immediate intervention** in patients with SCD:

- **Acute chest syndrome (D57.01/D57.211)**:[2,5] new pulmonary infiltrate + fever ≥38.5°C, respiratory distress, or hypoxia (SpO_2 <95%)
  - → **Leading cause of SCD death**; emergent exchange transfusion, antibiotics, supplemental O_2
- **Acute stroke**:[5,25] Sudden hemiparesis, aphasia, seizures, or altered consciousness
  - → Emergent CT head → exchange transfusion to reduce HbS <30%; ICU admission
- **Severe splenic sequestration (D57.02)**:[2,5] Acute splenomegaly + Hb drop ≥2 g/dL + tachycardia/hypotension
  - → Risk of hypovolemic shock; **emergent transfusion**
- **Sepsis in functionally asplenic patient**:[5] Fever ≥38.5°C with tachycardia or hypotension
  - → Emergent blood cultures and IV antibiotics against **encapsulated organisms** (*S. pneumoniae*, *H. influenzae*)
- **Multiorgan failure/aplastic crisis**:[2,5] Sudden severe anemia (Hb drop >3 g/dL) with reticulocytopenia (often parvovirus B19), or multisystem decompensation during crisis
  - → **Emergent transfusion**; parvovirus B19 serology; **ICU-level care**

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

These urgent conditions require expedited evaluation and intervention:

- **Severe VOC unresponsive to home oral opioids**[5,18]
  - → First dose of parenteral opioid **within 1 hour of arrival**; consider **infusion-center disposition** over ED
- **Priapism >2 hours**[5]
  - → Urologic emergency; risk of permanent erectile dysfunction
- **Acute vision changes** (sudden visual loss, floaters, flashes)[2,5]
  - → **Same-day ophthalmology** for proliferative retinopathy/vitreous hemorrhage
- **New or worsening dyspnea with TRV ≥2.5 m/s**[28,31]
  - → Concern for **PH decompensation or PE**; hematology/cardiology within 1–2 weeks for risk stratification
- **Acute kidney injury or new proteinuria >300 mg/g**[5,31]
  - → **Nephrology referral**; reassess hydroxyurea dose; do not wait for routine scheduling

3 MEAT DOCUMENTATION ESSENTIALS

SCD documentation translates clinical complexity into a record that supports **continuity, quality measurement, and appropriate care planning**. The most common gaps are **genotype omission** (forcing **D57.1** default),[4] **undocumented crisis-subtype** (**D57.00** instead of specific **D57.01 ACS** or **D57.02 splenic sequestration**), framing VOC pain as "back pain" alone, **omission of SCD coding** at stable encounters, misuse of **D57.3** (trait) **as active disease**, and **absent comorbidity coding** for CKD, PH, depression, AVN, and retinopathy. The MEAT framework below ties each element into **appropriate clinical action**:

***Case Vignette**: A 68-year-old with HbSS sickle cell anemia presenting for annual comprehensive visit. Reports increased fatigue over 3 months, two ED visits for pain in 6 months, and elevated home BP. History of ACS at age 42, CKD stage 3a (eGFR 52 mL/min). Current medications: hydroxyurea 1,000 mg daily (~15 mg/kg/day), lisinopril 10 mg, as-needed opioid. No prior pulmonary hypertension screening.*

MONITOR: "Pain trajectory: **2 VOC ED visits** over 6 months; baseline background pain plus episodic flares. **Functional status**: working part-time; PHQ-2 positive today. **Anemia**: Hb 7.8 g/dL (baseline 8.5); reticulocyte count 4.2%. **Renal function**: cystatin C eGFR 52 mL/min (down from 60 at 6 months); microalbumin/Cr ratio 145 mg/g. **Hydroxyurea adherence**: MPR estimated 0.65 = **sub-adherent**."

EVALUATE: "Annual comprehensive SCD visit per NASCC 2025 standard. **Screening this visit**: PHQ-9 (depression); TTE with TRV ordered (first PH screening, overdue); **cystatin C GFR**; urinalysis with microalbumin/Cr ratio; **dilated ophthalmologic exam scheduled**; vaccination status

verified: pneumococcal current, influenza due. Iron studies not indicated (not chronically transfused). Hydroxyurea adherence assessment **with mHealth app** discussion."

ASSESS: "**Diagnoses**: HbSS sickle cell anemia without crisis (**D57.1**; genotype-specific, confirmed by HPLC); CKD stage 3a (**N18.31**) with sickle nephropathy and moderately increased albuminuria; suboptimal hydroxyurea adherence (**Z91.14**); chronic SCD-related pain (**G89.21**); depression pending PHQ-9 confirmation (**F32.x**); hypertension (**I10**); functional asplenia (**D73.81**). **ACP discussion documented**."

TREAT: "**Hydroxyurea dose reduction**: CrCl ~52 mL/min triggers FDA-mandated renal adjustment: **reduce to 500 mg/day** (~7.5 mg/kg/day); recheck CBC and reticulocytes in 2 weeks. Titrate lisinopril to 20 mg for microalbuminuria 145 mg/g with sickle nephropathy. **Adherence intervention**: Refer to pharmacist-led MTM; offer mHealth app enrollment. PH screening echocardiogram ordered. Depression follow-up in 1 week with PHQ-9 and behavioral health referral. **Pain plan**: discuss infusion-center option for next VOC vs. ED. Hematology coordination for annual SCD center visit; **PCP serves as medical home for** adherence, comorbidity management, SDoH screening, and ACP."

Clinical Documentation Elements

- **Document the specific genotype explicitly**: HbSS, HbSC, HbS/β^0-thalassemia, HbS/β^+-thalassemia, or rare variants.[3,5] **Never use** 'sickle cell disease' as the only descriptor → **forces D57.1 default** and may inflate or understate the RAF for the patient's **true genotype**[5,40]
- **Document the three coding axes for D57.x at every encounter**: genotype + crisis status (active vs. stable) + specific complication when present.[5,40] **D57.01** (HbSS + ACS), **D57.02** (HbSS + splenic sequestration), **D57.03** (HbSS + cerebrovascular event), and **D57.09** (HbSS + other specified crisis) reflect severity that **D57.00** (unspecified crisis) does not[2,5]
- **Code SCD at every encounter — not only crisis visits**. Nearly **50%** of SCD hospitalizations lack a consistent SCD code; chronic conditions require annual HCC remapping
- **Code each comorbidity separately alongside D57.x**:[4] **N18.1–N18.6** (CKD); **I27.20–I27.29** (secondary PH); **H35.x** (proliferative sickle retinopathy); **M87.x** (avascular necrosis); **F32.x**/**F33.x** (depression — independent SCD mortality predictor); **D73.81** (hyposplenism/functional asplenia); **G89.21** (chronic SCD-related pain) when applicable
- **Document:** hydroxyurea status, dose, adherence assessment, and dose appropriateness for current renal function **at every visit**.[16] Document any **dose reduction rationale** (CrCl <60 mL/min → 7.5 mg/kg/day; myelosuppression → hold or reduce 5 mg/kg/day)
- **Document hemoglobin electrophoresis date and result** → genotype confirmation supports all subsequent **D57.x** coding. Repeat if records are unavailable
- **Document SDOH context with Z-codes when present** (**Z59.xx** housing, **Z59.41** food insecurity, **Z91.14** medication noncompliance) → support care planning and MA supplemental benefit justification[32,39]

- **Document advance care planning, surrogate decision-maker, and code status** → critical for elderly survivors with accumulating end-organ damage[23]
- **Document carrier status (D57.3) ONLY for confirmed sickle cell trait** = **never** for patients with active SCD.[5] Defaulting to **D57.3** when inappropriate **can misrepresent both** clinical truth and documentation mapping

Reframing Common Documentation Shortcuts

INSTEAD OF…	DOCUMENT…[22,23,31,40]
'Sickle cell disease'	'**HbSS sickle cell anemia** (**D57.1**, stable)' OR '**HbSC disease without crisis** (**D57.20**)' OR '**HbS/β^0-thalassemia** (**D57.42**)' → genotype-specific at every encounter
'Sickle cell crisis'	'Vaso-occlusive crisis, HbSS (**D57.00**)' OR 'Acute chest syndrome, HbSS (**D57.01**)' OR 'Splenic sequestration, HbSS (**D57.02**)' → specify genotype + crisis type
'Back pain' or 'leg pain' in a patient with SCD	'Vaso-occlusive crisis, HbSS, with bilateral lower extremity and lumbar involvement; consistent with prior pattern; managed with [analgesic plan]'; **formal VOC diagnosis** supports both clinical accuracy and HCC mapping
'On hydroxyurea'	'**Hydroxyurea 500 mg daily** (7.5 mg/kg/day; reduced from 15 mg/kg/day due to CrCl 52 mL/min); **reticulocyte response confirmed**; MPR 0.85; CBC stable; ANC 3,200; HbF 14%'
'Sickle cell trait' for a patient with active disease	Verify carrier vs. disease: sickle cell **TRAIT** is **D57.3** (HbAS carrier); patients with active disease have **D57.0x–D57.8x** based on confirmed genotype and crisis status; **NEVER** substitute **D57.3** for an active SCD code
'Anemia' in a patient with SCD	'**Baseline hemolytic anemia of SCD** (HbSS; **D57.1**); current Hb 8.2 g/dL (baseline range 7.5–9.0 g/dL); reticulocyte count 6%; LDH elevated; no signs of crisis or sequestration' = **distinguish baseline from acute drop**
'CKD' alongside SCD	'Sickle nephropathy with CKD stage 3a (**N18.31**); cystatin C eGFR 52 mL/min; albumin/creatinine ratio 145 mg/g; on lisinopril 20 mg with **hydroxyurea reduced** to 7.5 mg/kg/day per CrCl'
'Pulmonary hypertension'	'Pulmonary hypertension associated with SCD (**I27.21 + D57.1**); TRV 2.7 m/s on annual echocardiogram; awaiting right heart catheterization confirmation; **sildenafil avoided** = shows harm in SCD-PH; hematology/PH specialist co-managing'
'Depression' in a patient with SCD	'Major depressive disorder, single episode, moderate (**F32.1**); PHQ-9 score 14; independent SCD mortality predictor; **behavioral health referral made**; sertraline initiated'

INSTEAD OF…	DOCUMENT…[22,23,31,40]
'AVN' in a patient with SCD	'Avascular necrosis of right femoral head (**M87.051**) due to HbSS sickle cell anemia; chronic pain; orthopedic surgery referral made; physical therapy initiated; ambulation aids prescribed'
'Stroke history'	'**Cerebrovascular accident at age 32** (HbSS **D57.03** at acute presentation; current code **I69.3xx** = sequelae of cerebral infarction); on chronic transfusion for secondary prevention; HbS goal <30%; iron overload monitoring annual'

ABBREVIATIONS: HbSS = homozygous sickle cell anemia; HbSC = sickle/hemoglobin-C; SCD = sickle cell disease; VOC = vaso-occlusive crisis; HCC = Hierarchical Condition Category; CrCl = creatinine clearance; MPR = medication possession ratio; CBC = complete blood count; ANC = absolute neutrophil count; HbF = fetal hemoglobin; HbAS = heterozygous carrier (trait); Hb = hemoglobin; LDH = lactate dehydrogenase; CKD = chronic kidney disease; eGFR = estimated glomerular filtration rate; PH = pulmonary hypertension; TRV = tricuspid regurgitant jet velocity; PHQ = Patient Health Questionnaire; AVN = avascular necrosis; HbS = hemoglobin S

DOCUMENTATION REMINDER IS COMPREHENSIVE CODING

Every active SCD encounter should document:

(**1**) **Genotype explicitly** (HbSS, HbSC, HbS/β^0-thal, HbS/β^+-thal — not just 'sickle cell disease'),[3,5]

(**2**)**Crisis status** (active vs. stable) and **specific crisis type** when present (ACS, VOC, splenic sequestration, cerebrovascular event, dactylitis),[2,5]

(**3**)**Hydroxyurea dose and adherence** with dose appropriateness for current renal function,[16]

(**4**)**Every comorbidity** coded individually with **SCD-specific implications**:[2,5] CKD (N18.x), PH (I27.2x), retinopathy (H35.x), AVN (M87.x), depression (F32.x), functional asplenia (D73.81),

(**5**)**SDOH context** with Z-codes where present,[41] and

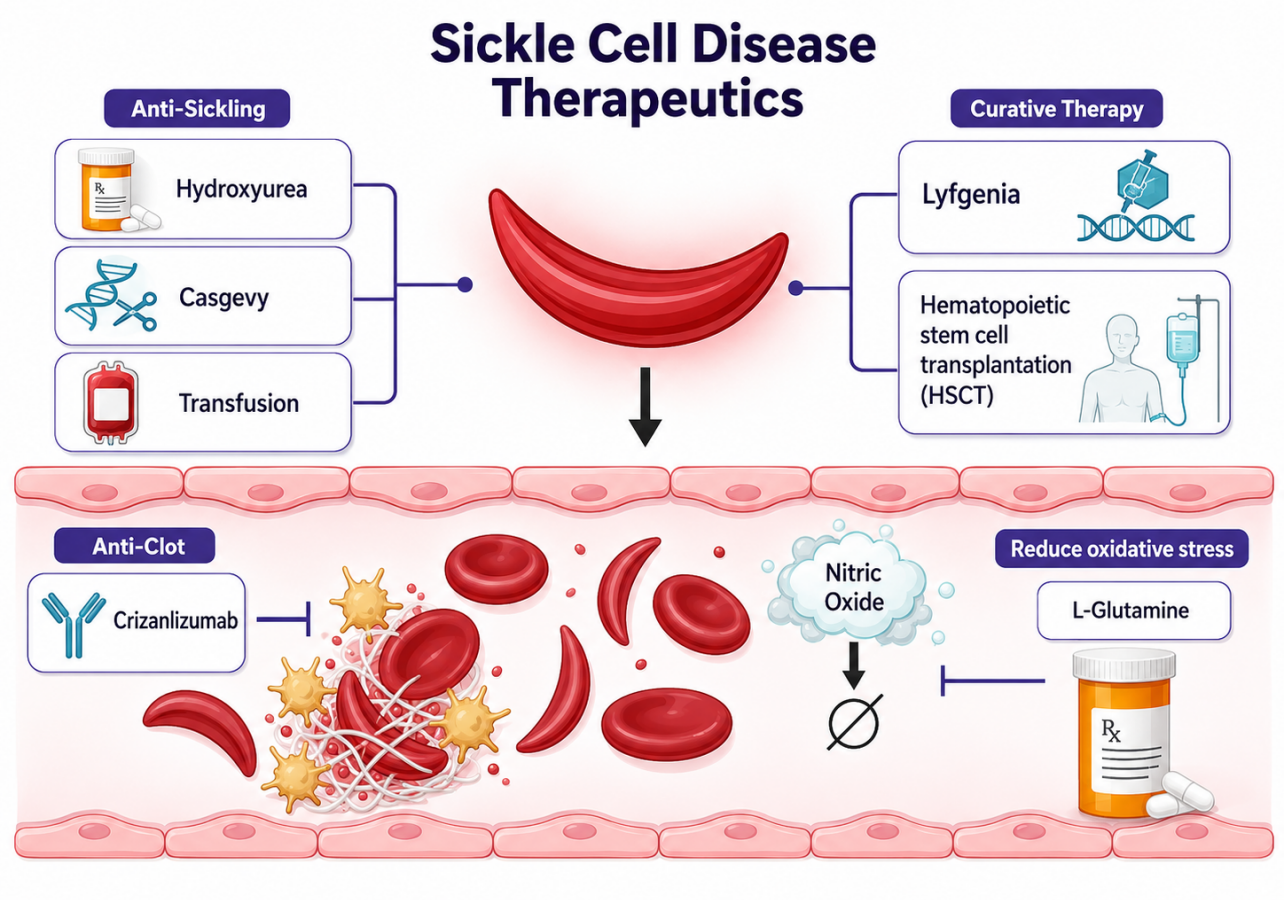
(**6**)**Advance care planning**[23]

4 TREATMENT AND REFERRAL QUICK GUIDE

SCD treatment is anchored on disease-modifying therapy with hydroxyurea, which prevents crises and reduces ED visits and inpatient admissions.[23,40] Only **~23% of adults with ≥3 pain crises/year** fill a hydroxyurea prescription, and **only 20.9% achieve adequate adherence** (MPR ≥0.8); yet adherent patients have **52% fewer VOC events**, **30% fewer hospitalizations**, **25% fewer ED visits**, and **20% lower total healthcare costs**.[2,16] Treatment selection is driven by genotype, complication history, and patient preference, **not chronological age alone**.[16]

In value-based care, the PCP's highest-value contributions center on **proactive hydroxyurea optimization and adherence support** for all eligible patients, dose adjustment for renal function, comorbidity co-management (CKD, depression, pulmonary hypertension), and serving as the **SCD medical home in coordination with hematology**.[16,22,23,31] Decisions on treatment intensity and escalation are **guided by**: functional status, organ-damage trajectory, and goals of care, **not** presentation context alone.

Therapeutic Landscape for Sickle Cell Disease



Therapy Escalation Criteria

TRIGGER*[23,25,31,40]	ACTION*
Adult with SCD never offered hydroxyurea	**Initiate hydroxyurea at 15 mg/kg/day** (or **7.5 mg/kg/day** if CrCl <60 mL/min); titrate by 5 mg/kg/day every 8 weeks toward mild myelosuppression target (**ANC 2,000–4,000/µL**); max 35 mg/kg/day[40]
≥3 severe VOCs in 12 months	**Strong indication for hydroxyurea initiation** if not already on therapy; escalate dose if subtherapeutic; consider L-glutamine or crizanlizumab as add-on (specialist co-management)[2,40]
Pain interfering with daily activities	**Hydroxyurea initiation**; individualized pain plan rather than weight-based opioid protocol; consider infusion-center referral for VOC[18]
Severe or recurrent ACS	**Hydroxyurea** (if not already); consider chronic transfusion; hematology co-management; specialist input on **add-on therapies**[2,40]

TRIGGER*[23,25,31,40]	ACTION*
Suboptimal hydroxyurea adherence (MPR <0.80)	**Implement adherence supports**: **mHealth** (InCharge Health: PDC 39.7% → 56.0%); community health worker (SHIP-HU: missed doses 4.5 → 1.8/month); pharmacist MTM[16,38]
CrCl <60 mL/min in adult on hydroxyurea	FDA-mandated **50% dose reduction** (7.5 mg/kg/day); recheck CBC and reticulocytes every 2–4 weeks during transition; renal function every 1–2 months[31]
≥2 pain crises/year despite hydroxyurea	**Add L-glutamine 5–15 g BID by weight** (Phase 3 RCT: 25% fewer pain crises, 33% fewer hospitalizations); FDA-approved for age ≥5; can be used **with or without hydroxyurea**[16,42]
VOC reduction needed in patient ≥16, any genotype	**Consider crizanlizumab 5 mg/kg IV** weeks 0 and 2 then every 4 weeks (STAND: VOCs reduced 2.98 → 1.63/year); covered under Medicare Part B; reevaluate annually[2,43]
Secondary stroke prevention or severe recurrent ACS	**Chronic transfusion therapy** (lifelong for secondary stroke prevention); goal HbS <30%; annual iron overload monitoring (ferritin + liver MRI); chelation when **ferritin >1,000 ng/mL**[25,44]
Patient age <65 with recurrent severe VOCs, treatment-refractory	**SPECIALIST ONLY**: discuss curative options at SCD center; **Casgevy** (97% freedom from severe VOCs) or **Lyfgenia** (87.5% freedom from VOCs) or **allogeneic HSCT**; not appropriate for **older patients with myeloablative conditioning**[45,46]
VOC requiring parenteral analgesia	Refer to **outpatient infusion center/day hospital** rather than ED: 9% vs. 37% admission rate (multicenter RCT); faster opioid initiation (62 vs. 132 min)[2,18]
TRV ≥2.5 m/s on echocardiogram	**Hematology/PH specialist referral**; right heart catheterization for definitive PH diagnosis; **AVOID** sildenafil (HARM in SCD-PH)[28,31]
Microalbuminuria >30 mg/g	**Initiate ACE inhibitor or ARB**; recheck microalbumin in 3 months[31,40]
Albuminuria >300 mg/g or eGFR decline	**Nephrology referral**; reassess hydroxyurea dose[2,31]
Voxelotor (Oxbryta) request	Voxelotor was **voluntarily withdrawn from the U.S. market** in September 2024 due to safety concerns = **do NOT prescribe**; counsel patient on alternative add-on options[47,48]

TRIGGER*[23,25,31,40]	ACTION*

ABBREVIATIONS: SCD = sickle cell disease; CrCl = creatinine clearance; ANC = absolute neutrophil count; VOC = vaso-occlusive crisis; ACS = acute chest syndrome; MPR = medication possession ratio; PDC = proportion of days covered; MTM = medication therapy management; CBC = complete blood count; BID = twice daily; RCT = randomized controlled trial; IV = intravenous; HbS = hemoglobin S; HSCT = hematopoietic stem cell transplantation; ED = emergency department; PH = pulmonary hypertension; TRV = tricuspid regurgitant jet velocity; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; eGFR = estimated glomerular filtration rate
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

CLINICAL PEARL: EARLY HYDROXYUREA INITIATION REDUCES PREVENTABLE SCD HOSPITALIZATIONS

When an adult with HbSS or HbSβ^0-thalassemia presents to primary care, **hydroxyurea should be initiated at the first eligible encounter**, not deferred to hematology referral. Only ~23% of eligible adults fill a hydroxyurea prescription, yet adherent use reduces hospitalizations by ~29%, ED visits by ~25%, and hospital length of stay by ~40%.[2,49] This single prescribing decision targets the **dominant cost driver**: inpatient admissions account for **over 70%** of total SCD expenditures.[12]

In older adults, **dose adjustment is mandatory** before initiation. The standard starting dose is 15 mg/kg/day, but the FDA requires a **50% reduction** to 7.5 mg/kg/day when CrCl falls below 60 mL/min (**AUC increases 64%** in this population). PBPK modeling further supports graded reductions of ~10%, 25%, and 45% for mild, moderate, and severe renal impairment, respectively.[17] **The sequence**: check eGFR → adjust starting dose → initiate hydroxyurea → monitor CBC every 2 weeks → titrate by 5 mg/kg every 8 weeks to maximum tolerated dose or 35 mg/kg/day **ensures that therapy begins safely** at the point of care rather than being **delayed by referral queues**, while renal-adjusted dosing prevents myelosuppression in the patients most vulnerable to it.

Medication Safety in Elderly with SCD

AGENT	KEY CONSIDERATIONS*	PCP ACTION*
Hydroxyurea (Hydrea, Siklos, Xromi)	**Disease-modifying backbone**; 50% dose reduction FDA-mandated if CrCl <60 mL/min; FDA carcinogen classification; serious AE 32% (**ESCORT-HU**); clinical response may take **3–6 months**[34,40]	CBC + reticulocytes q2–4 wk titration, q2–3 mo stable; renal function q1–2 mo in elderly (CKD prevalence ~47%); **sun protection counseling**; hold if ANC <2,000 or Plt <80,000[31,40]
L-Glutamine (Endari)	**FDA-approved age ≥5**; with or without hydroxyurea; Phase 3 RCT: 25% fewer pain crises, 33% fewer hospitalizations[42]	**GI tolerance check** (nausea common); weight-based dosing 5–15 g BID[42]
Crizanlizumab (Adakveo)	IV q4 wk after loading; any SCD genotype, age ≥16; **STAND**: VOCs 2.98 → 1.63/year[2,50]	**Medicare Part B covered**; monitor for infusion reactions; reevaluate annually[2]

AGENT	KEY CONSIDERATIONS*	PCP ACTION*
ACE inhibitor/ ARB (lisinopril, losartan)	Indicated for **microalbuminuria >30 mg/g** (sickle nephropathy); SCD-specific BP targets lower than general population[31]	Monitor potassium and renal function; **nephrology referral** if albuminuria >300 mg/g[31]
Sildenafil — for SCD-PH	**AVOID** = shows **HARM** in SCD-PH trials (**Walk-PHaSST**)[28,51]	PH specialist directs **alternative therapies**; hydroxyurea and chronic transfusion are disease-modifying approaches[31]
Opioids: VOC pain	Individualized dosing based on patient's daily intake + previously effective dose (**NOT** weight-based protocol); **pilot RCT**: 40.3% vs. 57.5% admission rate[18]	Pair with **multimodal non-opioid agents** (ketorolac, ketamine) where safe; SCD pain is physiological = do **NOT** label as 'drug-seeking'[40]
Iron chelation (deferasirox, deferoxamine)	Initiate when **ferritin >1,000 ng/mL** in chronically transfused patients; specialist-directed[40]	**Renal function monitoring critical**; annual ferritin + liver iron MRI[2]
Penicillin V prophylaxis	Verify history of **completed pediatric prophylaxis**; adults without it remain at risk from encapsulated organisms[22]	Confirm pneumococcal/meningococcal/Hib vaccination current[40]
Gene therapy (Casgevy, Lyfgenia)	**SPECIALIST ONLY**: myeloablative conditioning; **generally not appropriate ≥65**; Lyfgenia carries boxed warning for **hematologic malignancy**[46]	**Casgevy**: 97% freedom from **severe VOCs**; **Lyfgenia**: 87.5%; **lifelong monitoring required**[45]
Voxelotor (Oxbryta)	**DO NOT PRESCRIBE** = voluntarily withdrawn September 2024[47]	Imbalance in VOC events and fatal events; **remove from active medication lists**[2]

ABBREVIATIONS: CrCl = creatinine clearance; AE = adverse event; CBC = complete blood count; CKD = chronic kidney disease; ANC = absolute neutrophil count; Plt = platelets; RCT = randomized controlled trial; GI = gastrointestinal; BID = twice daily; IV = intravenous; SCD = sickle cell disease; VOC = vaso-occlusive crisis; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; BP = blood pressure; PH = pulmonary hypertension; SCD-PH = sickle cell disease-associated pulmonary hypertension; MRI = magnetic resonance imaging; Hib = Haemophilus influenzae type b
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

CRITERION[5,23,31]	SPECIALIST[22,28,37]	URGENCY[2,5,35]
New SCD diagnosis in adult (undiagnosed or transferred without records)	SCD center/hematology	**URGENT** (within 1–2 weeks): confirm genotype by hemoglobin electrophoresis/HPLC; baseline organ assessment; hydroxyurea candidacy; establish co-management plan
Acute chest syndrome (new infiltrate + fever/ respiratory symptoms/ hypoxia)	Hematology + pulmonology; ED if not already inpatient	**EMERGENT** (same day): exchange transfusion, broad-spectrum antibiotics, supplemental O_2; **leading cause of SCD death**
Stroke or acute neurologic change	Hematology + neurology; ED	**EMERGENT** (same day): emergent exchange transfusion; MRI/MRA brain; chronic transfusion program initiation for secondary prevention
TRV ≥2.5 m/s on echocardiogram	Hematology + PH specialist	**EXPEDITED** (1–2 weeks): right heart catheterization for definitive PH diagnosis; do **NOT** prescribe sildenafil (harm in SCD-PH)
CKD stage 3b+ or albuminuria >300 mg/g	Nephrology	**EXPEDITED** (1–2 weeks): sickle nephropathy management; hydroxyurea dose adjustment; **transplant evaluation** if progressing toward ESRD
≥3 severe VOCs in 12 months despite hydroxyurea	SCD center/hematology	**ROUTINE** (2–4 weeks): dose optimization; add-on therapy (L-glutamine, crizanlizumab); evaluate for curative therapy candidacy
Proliferative sickle retinopathy	Ophthalmology (retina specialist)	**EXPEDITED** (1–2 weeks): laser photocoagulation evaluation; more common in HbSC; **vision-threatening if untreated**
Symptomatic AVN (hip/shoulder)	Orthopedic surgery	**ROUTINE** (2–4 weeks): joint-preservation assessment; physical therapy; surgical planning if advanced
Iron overload (ferritin >1,000 ng/ mL, chronically transfused)	Hematology	**ROUTINE** (2–4 weeks): chelation initiation; liver iron MRI; agent selection (deferasirox vs. deferoxamine)
Recurrent priapism	Urology + hematology	**URGENT** (same day if episode >4 hours): aspiration/irrigation; hydroxyurea optimization; chronic management plan

CRITERION[5,23,31]	SPECIALIST[22,28,37]	URGENCY[2,5,35]
Pregnancy or pre-conception	Maternal-fetal medicine + hematology	**URGENT** (within 1 week of confirmed pregnancy): hydroxyurea discontinuation (teratogenic); transfusion planning; high-risk obstetric co-management
Depression with suicidality or severe nonadherence	Psychiatry/behavioral health	**URGENT** (same week): C-SSRS assessment; depression drives hydroxyurea nonadherence and is an independent mortality predictor
Pediatric-to-adult transition (age 18–25)	Adult SCD center	**ROUTINE** (planned): warm handoff with pediatric program; **target ≥2 adult visits in first year** post-transfer per NASCC 2025
Curative therapy evaluation (age <65, recurrent severe complications)	SCD center with gene therapy/transplant program	**ROUTINE** (2–4 weeks): discuss Casgevy, Lyfgenia, or allogeneic HSCT; myeloablative conditioning required; **generally not appropriate for patients ≥65**

ABBREVIATIONS: SCD = sickle cell disease; HPLC = high-performance liquid chromatography; ED = emergency department; MRI = magnetic resonance imaging; MRA = magnetic resonance angiography; TRV = tricuspid regurgitant jet velocity; PH = pulmonary hypertension; CKD = chronic kidney disease; ESRD = end-stage renal disease; VOC = vaso-occlusive crisis; HbSC = sickle/hemoglobin-C; AVN = avascular necrosis; C-SSRS = Columbia Suicide Severity Rating Scale; NASCC = National Alliance of Sickle Cell Centers; HSCT = hematopoietic stem cell transplantation

Follow-Up Timing

CONTEXT[23,35,40]	TIMING[28,40,52]
Hydroxyurea titration phase (dose adjusting)	CBC + reticulocytes + platelets **every 2–4 weeks** until stable dose
Hydroxyurea stable maintenance	CBC + reticulocytes + platelets **every 2–3 months**; MCV and HbF for response monitoring
Renal function in adult with SCD ± CKD	**Every 1–2 months** in elderly (CKD prevalence ~47%); cystatin C-based GFR preferred
Annual comprehensive SCD-specific visit (NASCC 2025 standard)	**Annually**; organ-specific screening (echocardiogram, ophthalmology, PHQ-9, microalbumin, vaccination status)
Post-VOC discharge — PCP follow-up	**Within 7 days**: review hydroxyurea adherence, individualized pain plan, ACS screening, transition planning if young adult
Microalbuminuria identified	**ACE inhibitor initiation**; recheck albumin/creatinine ratio at 3 months

CONTEXT[23,35,40]	TIMING[28,40,52]
TRV 2.5–2.9 m/s identified	Hematology/PH specialist **within 1–2 weeks**; right heart catheterization scheduling
New SCD complication or hospitalization	PCP follow-up **within 7 days**; communicate with SCD center/ hematology
Annual ophthalmology (proliferative sickle retinopathy)	**Every 12 months** from age 10, lifelong
Annual vaccination review (functional asplenia)	**Every 12 months**: pneumococcal, meningococcal, influenza, Hib per CDC adult schedule
Iron overload monitoring (chronically transfused)	**Every 12 months**: ferritin and liver iron MRI
Pediatric-to-adult transition (NASCC 2025)	Ensure **≥2 adult visits in first year post-transfer**; warm handoff with the pediatric SCD program
Behavioral health follow-up (depression)	Initiated **within 2 weeks** of positive PHQ-9; routine follow-up per behavioral health plan
Advance care planning	**Annually** + when goals or status change

ABBREVIATIONS: CBC = complete blood count; MCV = mean corpuscular volume; HbF = fetal hemoglobin; SCD = sickle cell disease; CKD = chronic kidney disease; GFR = glomerular filtration rate; NASCC = National Alliance of Sickle Cell Centers; PHQ = Patient Health Questionnaire; VOC = vaso-occlusive crisis; PCP = primary care provider; ACS = acute chest syndrome; ACE = angiotensin-converting enzyme; TRV = tricuspid regurgitant jet velocity; PH = pulmonary hypertension; Hib = Haemophilus influenzae type b; MRI = magnetic resonance imaging

CLINICAL PEARL: HYDROXYUREA IS THE ANCHOR

Hydroxyurea is the single highest-priority disease-modifying therapy in SCD.[5,53] Adherent patients experience **52%** fewer VOC events, **~30%** fewer hospitalizations/year, **~25%** fewer ED visits/year, and **~20%** lower SCD-related total healthcare expenditures.[1,16] Long-term MSH follow-up showed up to **40%** mortality reduction.[5] The FDA carcinogen classification of hydroxyurea reflects **historical concerns**; long-term follow-up (up to 17.5 years MSH) has shown **no statistically significant increase in AML risk** after adjusting for ascertainment bias.[5] The behavior gap, **not the drug**, is the limiting factor: only **~23%** of adults with ≥3 pain crises/year fill a hydroxyurea prescription nationally.[1,16] Adherence interventions like the **InCharge Health mHealth app** (PDC 39.7% → 56.0%)[38] and community health workers (SHIP-HU: missed doses 4.5 → 1.8/month)[39] are **evidence-based VBC investments**.

Comorbidity Management — Primary Care Role

COMORBIDITY	VBC APPROACH*[2,23,31,40]	CAUTION*[18,28,31,54]
CKD/Sickle Nephropathy (N18.x)	**Cystatin C eGFR** + urine albumin/ creatinine ratio annually; stage explicitly (**N18.31/32/4**); ACE/ARB if albuminuria >30 mg/g; **hydroxyurea dose reduction** 50% if CrCl <60; **nephrology referral** if albuminuria >300 mg/g or eGFR declining	CKD prevalence **~47%** in older adults with SCD; standard creatinine-based eGFR overestimates true GFR due to tubular hypersecretion → **cystatin C mandatory**; sickle nephropathy progresses to ESRD in **4–18%**
Depression/MDD (F32.x/ F33.x)	**PHQ-9 annually** at comprehensive visit; initiate sertraline or escitalopram (**generic**); integrated behavioral health referral; **C-SSRS** if PHQ-9 Item 9 positive	**25–35%** prevalence; depression predicts pain severity more strongly than genotype; comorbid depression associated with **7.6% vs. 14.0%** hydroxyurea adherence (PDC ≥80%); independent mortality predictor (HR >3)
Pulmonary Hypertension (I27.2x)	**Annual echocardiogram with TRV**; refer to hematology/PH specialist if **TRV ≥2.5 m/s**; right heart catheterization for definitive diagnosis	TRV ≥2.5 m/s = **10x mortality increase**; 6-year mortality 37% vs. 17%; **sildenafil shows HARM** in SCD-PH → do **NOT** prescribe; hydroxyurea and chronic transfusion are disease-modifying approaches
Chronic Pain (G89.29)	**Individualized pain plan** (not weight-based protocol); **multimodal non-opioid agents** (NSAIDs if renal function permits, tizanidine, gabapentin); infusion center referral for acute VOC; behavioral pain strategies	SCD pain is physiological → do **NOT** label as drug-seeking; **chronic pain distinct from acute VOC**; opioid tolerance expected in long-term patients; infusion center: 9% vs. 37% admission rate vs. ED
Avascular Necrosis (M87.x)	**Screen for hip/shoulder pain** at annual visit; targeted imaging when symptomatic; **orthopedic referral**; physical therapy; ambulation aids	Affects **30–50%** of HbSS patients by age 35; bilateral involvement common; early detection improves joint-preservation options
Retinopathy (H35.x)	Annual dilated eye exam from age 10, lifelong; **ophthalmology referral** for proliferative changes	**More common in HbSC than HbSS**; proliferative sickle retinopathy can cause **vision loss without symptoms**; laser photocoagulation if proliferative
Iron Overload (E83.110)	Annual ferritin + liver iron MRI in chronically transfused patients; chelation when **ferritin >1,000 ng/mL**; specialist-directed agent selection	**Chelation-related nephrotoxicity** requires monthly renal monitoring; oral deferasirox preferred for adherence; not applicable to patients on hydroxyurea alone

COMORBIDITY	VBC APPROACH*[2,23,31,40]	CAUTION*[18,28,31,54]
Hypertension (I10)	**BP monitoring at every visit**; ACE/ARB preferred (dual benefit for nephropathy); target lower absolute values than general population	SCD patients have **lower baseline BP** due to chronic anemia → "normal" readings **may represent relative hypertension**; rising BP may signal renal deterioration
Anxiety/ Insomnia	**CBT-I first-line for insomnia**; SSRI for GAD; taper and discontinue benzodiazepines (Beers PIMs in elderly)	Healthcare-system distrust and stigma **compound anxiety**; benzodiazepines increase fall risk; avoid sedative-hypnotics in patients with baseline hypoxemia risk
Vitamin D Deficiency (E55.9)	**Annual 25-OH vitamin D level**; supplement if <30 ng/mL; standard dosing (1,000–2,000 IU daily)	Prevalence **65–100%** in SCD; contributes to bone pain, AVN risk, and fatigue; **long-term hydroxyurea may worsen deficiency**

ABBREVIATIONS: CKD = chronic kidney disease; eGFR = estimated glomerular filtration rate; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; CrCl = creatinine clearance; SCD = sickle cell disease; ESRD = end-stage renal disease; MDD = major depressive disorder; PHQ-9 = Patient Health Questionnaire-9; C-SSRS = Columbia Suicide Severity Rating Scale; PDC = proportion of days covered; HR = hazard ratio; TRV = tricuspid regurgitant jet velocity; PH = pulmonary hypertension; NSAID = nonsteroidal anti-inflammatory drug; VOC = vaso-occlusive crisis; ED = emergency department; HbSS = homozygous sickle cell anemia; HbSC = sickle/hemoglobin-C; MRI = magnetic resonance imaging; BP = blood pressure; CBT-I = cognitive behavioral therapy for insomnia; SSRI = selective serotonin reuptake inhibitor; GAD = generalized anxiety disorder; PIM = potentially inappropriate medication (Beers criteria); AVN = avascular necrosis

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Cost-Smart Options

BRAND (EST. COST)*[2,40,55–57]	ALTERNATIVE (EST. COST)*[2,40,55–57]	EST. SAVINGS	COST-SMART TIP*[2,40,55–57]
L-Glutamine (Endari) ~$2,900–$8,700/mo (brand only; weight-based dosing)	Pharmaceutical-grade L-glutamine powder (OTC) **~$20–$50/mo**	**~$2,850–$8,650/mo**	**NOTE**: Endari is the **only FDA-approved formulation**; OTC L-glutamine is **NOT** therapeutically equivalent and was not studied in the pivotal trial; insurance coverage variable, prior authorization common; **manufacturer copay assistance available**

BRAND (EST. COST)*[2,40,55–57]	ALTERNATIVE (EST. COST)*[2,40,55–57]	EST. SAVINGS	COST-SMART TIP*[2,40,55–57]
Crizanlizumab (Adakveo) ~$8,500/mo (IV q4 wk after loading; provider-administered)	Hydroxyurea optimization + L-glutamine add-on **~$150–$300/mo combined**	**~$8,200/mo**	**Crizanlizumab is Medicare Part B** (provider-administered); confirm hydroxyurea is maximally titrated before adding; Phase III **STAND** data less robust than Phase II SUSTAIN → **EU approval rescinded**; annual reevaluation recommended
Deferasirox brand (Jadenu) ~$3,000–$5,000/mo (weight-based; oral once daily)	**Generic** deferasirox **~$500–$1,500/mo**; deferiprone (Ferriprox) **~$1,500–$2,500/mo**	**~$1,500–$3,500/mo**	**Generic deferasirox now available** → prescribe generic specifically; oral chelation preferred over SC deferoxamine (**for adherence**); specialist-directed; monitor renal function monthly
Hydroxyurea brand (Siklos) ~$1,500–$2,000/mo	**Generic** hydroxyurea (Hydrea generic) **~$100–$150/mo**	**~$1,350–$1,850/mo**	**Generic hydroxyurea is the single most cost-effective SCD therapy**; Siklos offers scored tablets for precise pediatric dosing but generic capsules are **adequate for most adults**; Xromi (oral solution) ~$500/mo for patients unable to swallow capsules
Gene therapy: Casgevy ~$2.2 million (one-time)	**Gene therapy: Lyfgenia ~$3.1 million (one-time)**	**N/A: both one-time**	Both require **myeloablative conditioning** and **authorized treatment centers**; Casgevy has no boxed warning; Lyfgenia carries boxed warning for **hematologic malignancy**; Medicaid and commercial payers negotiating outcomes-based contracts; **generally not appropriate for patients ≥65**
Chronic transfusion program ~$30,000–$50,000/yr (blood products + chelation + monitoring)	Hydroxyurea optimization **~$1,200–$1,800/yr** (generic)	**~$28,000–$48,000/yr**	**SWiTCH** and **TWiTCH** trials showed hydroxyurea can replace chronic transfusion for primary stroke prevention in selected patients; secondary stroke prevention still requires transfusion; discuss with hematology before any transition

BRAND (EST. COST)*[2,40,55–57]	ALTERNATIVE (EST. COST)*[2,40,55–57]	EST. SAVINGS	COST-SMART TIP*[2,40,55–57]
Lisinopril or losartan (generic ACE/ARB) ~$1–$12/mo	N/A: already lowest cost	N/A	**Already inexpensive generic**; indicated for microalbuminuria >30 mg/g in sickle nephropathy; $0 copay on most Medicare Part D plans; no cost barrier to initiation
Opioids for VOC (generic morphine, hydromorphone) ~$5–$30/mo	Infusion center model for acute VOC (**avoids ED + admission costs**)	**Variable: avoids ~$15,000–$25,000/ admission**	**Infusion center**: 9% vs. 37% admission rate and 62 vs. 132 min to first dose vs. ED; individualized dosing reduces admissions (40.3% vs. 57.5%); pair with **multimodal non-opioid agents** where safe
Penicillin V prophylaxis (generic) ~$5–$10/mo	N/A: already lowest cost	N/A	**Verify completion of pediatric prophylaxis** in adults; ensure pneumococcal/meningococcal/Hib vaccinations current for functional asplenia; no cost barrier
Sertraline or escitalopram (depression) generic ~$5–$15/mo	**Behavioral health integration (Medicare Part B covers therapy)**	N/A: already generic	Depression is an **independent SCD mortality predictor**; PHQ-9 at every visit; bundle behavioral health under integrated care model; no cost barrier to SSRI initiation

ABBREVIATIONS: OTC = over-the-counter; IV = intravenous; SC = subcutaneous; SCD = sickle cell disease; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; VOC = vaso-occlusive crisis; ED = emergency department; Hib = Haemophilus influenzae type b; PHQ-9 = Patient Health Questionnaire-9; SSRI = selective serotonin reuptake inhibitor; WAC = wholesale acquisition cost; CrCl = creatinine clearance
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

SCD patient education centers on three priorities: understanding the specific genotype and its implications, recognizing emergencies that require immediate care, and maintaining adherence to disease-modifying therapy, **particularly hydroxyurea**, where only ~23% of eligible adults fill a prescription despite proven reductions in crises, hospitalizations, and mortality.[16,38,39]

DOCUMENTATION REMINDER — PATIENT EDUCATION

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

- **Diagnosis in plain language**: Document that the patient understands their specific SCD genotype (HbSS, HbSC, HbS/β^0-thal, HbS/β^+-thal), that SCD is a **lifelong condition** requiring ongoing multisystem surveillance, and the **difference between sickle cell disease and sickle cell trait**[22]
- **Treatment plan and hydroxyurea expectations**: Document modalities discussed (hydroxyurea, L-glutamine, crizanlizumab if applicable, chronic transfusion if indicated); clarify that hydroxyurea **takes 3–6 months for full clinical response**, requires regular blood monitoring, and must be dose-adjusted for renal function; emphasize that **adherence directly reduces crises** (52% fewer VOCs in adherent patients)
- **When to seek emergency care**: Document counseling on warning signs requiring urgent evaluation: fever ≥38.5°C (sepsis risk from functional asplenia), sudden pallor or worsening fatigue (splenic sequestration, aplastic crisis), chest pain with dyspnea or cough (acute chest syndrome — leading cause of SCD death), sudden severe headache or neurologic changes (stroke), and priapism lasting >4 hours
- **Self-management between visits**: Adequate hydration (hyposthenuria increases dehydration susceptibility); avoidance of VOC triggers (temperature extremes, overexertion, dehydration); home pain management with oral analgesics, heat, and rest before escalating to medical care; incentive spirometry during pain episodes to prevent ACS
- **Vaccination and infection prevention**: Document counseling on the functional asplenia vaccination schedule — pneumococcal (PCV20), meningococcal (MenACWY + MenB with boosters), Hib, annual influenza — and the rationale for each; verify penicillin prophylaxis history in adults who transitioned from pediatric care
- **Screening schedule**: Document counseling on annual comprehensive SCD visit components: echocardiogram (TRV for PH screening), dilated eye exam (retinopathy), renal function with microalbumin, PHQ-9 (depression), and CBC with reticulocytes for hydroxyurea monitoring
- **Advance care planning**: Median age at death is 45 years; 63% die in hospital; acute care utilization is stable until the final month of life when it sharply increases — ACP should begin early, not at end-of-life; document surrogate designation, code status, and goals of care; billable as CPT 99497/99498 during AWV with no patient copay

Quality Metrics Tie-In

No SCD-specific HEDIS or MIPS measures are currently active in MY2026, though ASH has developed an eCQM for **median time to pain medication** in ED VOC encounters.[13] Two NQF-endorsed pediatric quality measures exist, **i**) antibiotic prophylaxis (ages 3 months–5 years) and **ii**)

annual TCD screening (ages 2–16 years); however, adherence remains low (22% and 47%, respectively).[58] For adult SCD in value-based programs, the **disease's combination of** chronic pain, polypharmacy (hydroxyurea, opioids, ACE inhibitors, chelation, antivirals), high hospitalization burden (**33% 30-day readmission rate** vs. 12% non-SCD), depression prevalence of **25–35%**, and reduced life expectancy (**~54 years**) means that **cross-cutting national measures apply across the entire care trajectory** and can anchor quality reporting for any PCP managing an SCD patient.

MEASURE	STANDARD	APPLICABILITY TO SICKLE CELL DISEASE*[2,5,23,59]
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	**Polypharmacy is common in SCD**: hydroxyurea, opioids, ACE inhibitors/ARBs, iron chelation, anticoagulants, and comorbidity medications create high interaction risk; documented medication review should **reconcile nephrotoxic drugs** against fluctuating renal function (cystatin C eGFR) and hydroxyurea dose adjustments for CrCl
HEDIS COA: Care for Older Adults-Functional Status Assessment	**Denominator**: enrollees ≥66; **Numerator**: functional status assessment documented annually **Exclusions**: hospice, ESRD	ECOG performance status, gait assessment, and musculoskeletal exam (AVN screening) **directly satisfy this sub-measure**; NASCC recommends functional assessment at every annual comprehensive visit including physical activity, school/job performance, and mood
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	SCD 30-day readmission rate is **33%** (vs. 12% non-SCD); **VOC** is the leading readmission diagnosis; absence of a listed PCP is an independent risk factor for readmission (OR 0.38); post-discharge medication reconciliation is critical given **fluctuating renal dosing of hydroxyurea**
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 prevalence in SCD is **25–35%**; depression predicts pain **more strongly than genotype**; comorbid depression is associated with significantly lower disease-modifying therapy adherence (7.6% vs. 14.0% PDC ≥80%); antidepressant-adherent patients have 16.7x higher odds of SCD DMT adherence

MEASURE	STANDARD	APPLICABILITY TO SICKLE CELL DISEASE*[2,5,23,59]
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	Median age at death is **45 years**; 63% die in hospital and 15% in ED; acute care utilization is stable until the final month of life when it sharply increases; ACP should begin early, **not at end-of-life**; billable as CPT 99497/99498 during AWV with no copay
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	SCD has the **highest 30-day readmission rate** among chronic conditions (**33%**); younger adults (18–29) have the highest risk at **35.1%**; Medicaid (aRR 1.53) and Medicare (aRR 1.67) admissions carry higher readmission risk vs. private insurance; **RBC transfusion** is associated with lower readmission risk

ABBREVIATIONS: HEDIS = Healthcare Effectiveness Data and Information Set; COA = Care for Older Adults; MA = Medicare Advantage; ESRD = end-stage renal disease; SCD = sickle cell disease; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; eGFR = estimated glomerular filtration rate; CrCl = creatinine clearance; AVN = avascular necrosis; ECOG = Eastern Cooperative Oncology Group; NASCC = National Alliance of Sickle Cell Centers; TRC = Transitions of Care; PCP = primary care provider; VOC = vaso-occlusive crisis; DMS-E = Depression Monitoring and Follow-Up; PHQ-9 = Patient Health Questionnaire-9; PDC = proportion of days covered; DMT = disease-modifying therapy; ACP = advance care planning; ED = emergency department; CPT = Current Procedural Terminology; AWV = Annual Wellness Visit; PCR = plan all-cause readmissions; RBC = red blood cell; PCV20 = 20-valent pneumococcal conjugate vaccine; MenACWY = meningococcal conjugate vaccine groups A/C/W/Y; MenB = meningococcal serogroup B vaccine; Hib = Haemophilus influenzae type b; SDoH = social determinants of health
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

- **Status-specific D57.x at every encounter**:[4] Assign the genotype-specific code = **D57.0x/D57.1** for HbSS, **D57.2x** for HbSC, **D57.42**/**D57.43x** for $S\beta^0$-thalassemia, **D57.44**/**D57.45x** for $S\beta^+$-thalassemia + crisis subtype when applicable (**ACS .01**/**.211**/**.431**/**.451**; **splenic sequestration .02**/**.212**/**.432**/**.452**; **cerebral .03**/**.213**/**.433**/**.453**; **dactylitis .04**/**.214**/**.434**/**.454**). Use "without crisis" codes for stable disease. Defaulting to **D57.1 without genotype confirmation** = most common coding error

- **Never use D57.3 for active sickle cell disease**:[4] D57.3 is sickle cell **TRAIT** (HbAS carrier, one normal HBB allele) = it carries **no HCC and no payment weight**. Coding D57.3 for a patient with SCD forfeits all risk adjustment and **misrepresents the clinical picture**
- **Crisis subtype matters = specify the sixth character**:[5] ACS is the leading cause of SCD death; coding **D57.00** (unspecified crisis) instead of **D57.01** (ACS) **loses clinical specificity** and may underrepresent severity. When crisis is present, **document the type**: ACS, splenic sequestration, cerebral vascular involvement, dactylitis, or other specified complication
- **End-organ complications coded separately and linked to SCD**:[2,3] CKD (**N18.1–N18.6**), pulmonary hypertension (**I27.2x**), retinopathy (**H35.x**), avascular necrosis (**M87.x**), depression (**F32.x/F33.x**), iron overload (**E83.110**), functional asplenia (**D73.81**). Each complication carries its own HCC weight and must be **individually documented with linkage language** (e.g., "CKD stage 3a secondary to sickle nephropathy")

Annual Clinical Review and Confirmation

- **Annual reconfirmation and visit modality:** The annual comprehensive SCD visit should be a **1-hour encounter with an SCD specialist**, conducted at baseline (well, no acute visit in preceding 2 weeks). **It must include** review of acute care utilization, transfusion history, new complications, disease-modifying therapy adjustments, and preventive screening updates. NASCC recommends this visit occur at an **NASCC-recognized SCD center**[23]
- **Genotype confirmation:** Verify hemoglobin electrophoresis or HPLC date and result; **repeat if records unavailable**. Document genotype **explicitly** (HbSS, HbSC, HbS/β^0-thal, HbS/β^+-thal) and assign the corresponding **D57.x** code. A structured "SCD Genotype" field in the EHR prevents nonspecific coding[4]
- **Hydroxyurea monitoring**:[5] Document current dose, weight-based calculation, ANC, HbF, MCV, reticulocyte count, and adherence metric (MPR/PDC). CBC with differential and reticulocyte count should be monitored **every 2–3 months** once a stable dose is established. A clinical response may take **3–6 months**; a 6-month trial at maximum tolerated dose is required **before considering treatment failure**
- **CKD screening**:[2,5] Annual cystatin C–based eGFR and urine microalbumin/creatinine ratio **beginning at age 10**. ACE inhibitor or ARB therapy is recommended for **microalbuminuria** (>30 mg/g); **nephrology referral** for significant albuminuria (>300 mg/g)
- **Pulmonary hypertension screening**:[28] Echocardiogram with TRV measurement; TRV ≥2.5 m/s warrants **hematology/PH specialist referral** and consideration of right heart catheterization. The American Thoracic Society **recommends against** phosphodiesterase-5 inhibitor therapy (sildenafil) in SCD-related PH based on the Walk-PHaSST trial showing **increased vaso-occlusive events**. Hydroxyurea is first-line for patients at increased mortality risk (TRV ≥2.5 m/s or NT-proBNP ≥160 pg/mL)

- **Depression and mental health screening**:[60,61] Annual PHQ-2/PHQ-9; depression and anxiety are common in SCD and adversely affect quality of life, clinical outcomes, and mortality. **Evidence-based treatment includes** CBT and SSRIs/SNRIs, with consideration for agents that also treat neuropathic pain. Code **F32.x/F33.x** with severity specification
- **Retinopathy screening**:[5,22] Annual dilated ophthalmologic exam beginning at age 10, lifelong, **for all genotypes**. Proliferative retinopathy is more common in **HbSC than HbSS**. Referral for laser photocoagulation when proliferative changes are identified
- **Vaccination status**:[22] Pneumococcal (PCV20 series), meningococcal (MenACWY + MenB), Hib, annual influenza, hepatitis B, and SARS-CoV-2 per CDC schedule for functional asplenia. Document each vaccination date and **functional asplenia status** (**D73.81**)
- **Iron overload (chronically transfused)**:[3,23] Annual ferritin and liver iron MRI; **chelation therapy** when ferritin >1,000 ng/mL. Code **E83.110** when iron overload is confirmed; document chelation regimen
- **SDoH and stigma assessment**:[41] Embed structured SDOH screen at annual visit, including housing (**Z59.xx**), food insecurity (**Z59.41**), transportation, healthcare-system experience. Universal screening connects families with community resources and supports MA supplemental benefit justification
- **Transition status (young adult)**:[37] NASCC defines successful transfer as **≥2 adult visits** in the first year post-transfer. Document transition readiness, warm handoff completion, and adult-care continuity as discrete EHR fields. Structured transition processes using the **Six Core Elements framework** improve readiness assessments and emergency care plan completion

Good Documentation is Comprehensive Coding

EHR SHORTCUT/ RISK	PREFERRED DOCUMENTATION LANGUAGE[2,5,62]
"Sickle cell disease, stable."	"HbSS sickle cell anemia, stable, without crisis (**D57.1**, HbSS confirmed by HPLC 2018); on hydroxyurea 1,000 mg/day; adherent (MPR 0.88); ANC 3,500; HbF 14%; baseline Hb 8.4 g/dL; vaccinations current."
"Sickle cell, no crisis." OR "D57.1."	"HbSC disease without crisis (**D57.20**); HPLC-confirmed; on L-glutamine + hydroxyurea 750 mg/day; PHQ-9 negative; **annual dilated eye exam scheduled**; vaccinations current."
"Sickle cell crisis. Pain control. D57.00."	"Vaso-occlusive crisis, HbSS sickle cell anemia (**D57.00** = type unspecified; rule out ACS); bilateral lower extremity and lumbar pain; pattern consistent with prior; SpO_2 98%; CXR clear; managed with individualized opioid plan + ketorolac; infusion-center disposition arranged."

EHR SHORTCUT/ RISK	PREFERRED DOCUMENTATION LANGUAGE[2,5,62]
"SCD, possible pneumonia."	"Acute chest syndrome, HbSS sickle cell anemia (**D57.01**); new right lower lobe infiltrate, fever 38.7°C, SpO_2 92%; **emergent hematology consult**; exchange transfusion arranged; ceftriaxone + azithromycin initiated."
"SCD + shortness of breath, doing echo."	"HbSC disease (**D57.20**); new exertional dyspnea; TTE TRV 2.7 m/s: concerning for pulmonary hypertension; **PH specialist referral expedited**; right heart catheterization scheduled; sildenafil **AVOIDED** (harm in SCD-PH)."
"SCD with kidney involvement."	"HbSS sickle cell anemia (**D57.1**) with sickle nephropathy; CKD stage 3a (**N18.31**, cystatin C eGFR 52 mL/min); moderately increased albuminuria 145 mg/g; lisinopril 20 mg initiated; hydroxyurea reduced to 7.5 mg/kg/day per FDA renal label; **nephrology referral made**."
"Sickle cell disease coded as D57.3."	"Hemoglobin electrophoresis shows HbAS (**one normal HBB allele**); patient has sickle cell **TRAIT**, not disease (**D57.3**); **no D57.0x–D57.8x code applies**; counsel on carrier status implications."
"On hydroxyurea, doing OK."	"HbSS sickle cell anemia (**D57.1**) with suboptimal hydroxyurea adherence (MPR 0.62 = **Z91.14**); referred to InCharge Health mHealth app per multilevel mHealth trial (PDC 39.7% → 56.0%); community health worker enrollment per SHIP-HU model."
"Stable"	"Last VOC 8 months ago; baseline Hb 8.4 g/dL (stable); ANC 3,500; HbF 14%; cystatin C eGFR 68 mL/min; microalbumin/Cr ratio 22 mg/g; TRV 2.1 m/s; PHQ-9 negative; ECOG PS 1; weight stable."

ABBREVIATIONS: EHR = electronic health record; HbSS = homozygous sickle cell anemia; HPLC = high-performance liquid chromatography; MPR = medication possession ratio; ANC = absolute neutrophil count; HbF = fetal hemoglobin; Hb = hemoglobin; HbSC = sickle/hemoglobin-C; PHQ-9 = Patient Health Questionnaire-9; ACS = acute chest syndrome; SpO_2 = peripheral oxygen saturation; CXR = chest X-ray; SCD = sickle cell disease; TTE = transthoracic echocardiogram; TRV = tricuspid regurgitant jet velocity; PH = pulmonary hypertension; CKD = chronic kidney disease; eGFR = estimated glomerular filtration rate; FDA = US Food and Drug Administration; HBB = hemoglobin subunit beta; PDC = proportion of days covered; VOC = vaso-occlusive crisis; ECOG PS = Eastern Cooperative Oncology Group Performance Status

Good Documentation — EHR Tips

- **EHR TIP — Smartphrase]** Build a **.scd_visit dot phrase** that **auto-populates**: genotype-specific **D57.x code** (D57.1 HbSS, D57.20 HbSC, D57.411 $S\beta^0$, D57.451 $S\beta^+$), electrophoresis/HPLC confirmation date, hydroxyurea dose with adherence metric (MPR/PDC), last ANC/HbF, crisis history, end-organ status (CKD stage, TRV, PHQ-9, retinal exam), and vaccination status. Separate **.voc_encounter** phrase for **crisis visits**: genotype, crisis type (VOC, ACS, sequestration, stroke), individualized opioid plan, ACS rule-out steps, and disposition. **Eliminates unspecified "sickle cell disease" coding** and supports MEAT documentation in a single paste
- **[EHR TIP — Alert]** Filter "**SCD Active**" = **D57.x** on problem list without hematology or PCP visit in 12 months. "Genotype-to-HCC Check" = confirms D57.x specificity (HCC 107 vs. 108);

flags D57.3 (trait, no HCC) coded as disease. "Hydroxyurea Monitoring Due" = active hydroxyurea without CBC/ANC in 3 months

- **[EHR TIP — Best Practice]** Pin **genotype-specific D57.x with electrophoresis date** (e.g., "HbSC disease, **D57.20**, HPLC confirmed 2014"), **not** "sickle cell disease." Add structured "**SCD Genotype**" field linked to problem list; require entry **before D57.x selection**. Code comorbidities **individually** (CKD **N18.x**, depression **F33.x**). Document SDOH with Z-codes annually. Track transition milestones for young adults (first/second adult visits as discrete fields). Flag **nonadherence** with **Z91.14**
- **[EHR TIP — Workflow] Fire BPA when**: hydroxyurea absent from medication list (offer initiation); dose not adjusted for CrCl; vaccinations overdue; no echocardiogram, PHQ-9, or microalbumin in 12 months; no MEAT-documented encounter in 12 months. **Flag unspecified D57.1 persisting >30 days** without genotype confirmation for specificity upgrade
- **[EHR TIP — Order Set]** "**SCD Annual Comprehensive**": CBC with reticulocytes, CMP with cystatin C, microalbumin/Cr ratio, echocardiogram with TRV, PHQ-9, vaccination review, retinal exam referral, advance care planning prompt. "**VOC Pain Management**:" individualized opioid dosing per home regimen, multimodal analgesia (ketorolac, ketamine), IV fluids, oxygen if SpO_2 <95%, CXR if respiratory symptoms

Brief Case Examples

SUCCESS: GENOTYPE-SPECIFIC CODING AT ANNUAL VISIT

SCENARIO

A 71-year-old with **HbSC disease** (HPLC-confirmed 2014), HTN, CKD stage 2, on hydroxyurea 750 mg/day, lisinopril 20 mg. Last VOC 8 months ago. Presents for annual sickle cell disease review; reports stable symptoms, no new crises. Provider reviewed most recent labs, performed medication adherence assessment, and documented the full clinical picture **in a single encounter**.

Documentation: "**D57.20**: HbSC sickle cell disease **without crisis** (HPLC-confirmed 2014); on hydroxyurea 750 mg/day with MPR 0.91 (adherent); ANC 4,100; HbF 11%. **N18.2**: CKD stage 2 (cystatin C eGFR 68 mL/min); microalbumin/Cr ratio 22 mg/g. **I10**: HTN, controlled on lisinopril 20 mg. PHQ-2 negative. Vaccinations current. Annual TTE TRV **2.1 m/s**. Annual ophthalmology completed. Return 6 months or sooner for new symptoms."

Outcome: D57.20 (**HCC 108**) + **N18.2** + **I10** mapped with full annual review documented. **Every MEAT element present**: genotype-confirmed diagnosis with confirmatory test and date, treatment regimen with adherence metric, lab values, comorbidity staging, validated screening tool, surveillance studies, and follow-up interval with return criteria.

PITFALL: INSUFFICIENT DOCUMENTATION

SCENARIO

A 64-year-old long-time patient referenced in records as "sickle cell disease" **without prior genotype documentation**. On hydroxyurea per outside hematology. Last hemoglobin electrophoresis not in current EHR.

Documentation as written: "Sickle cell disease, stable, no crisis. **D57.1**."

Consequence: (**1**) **D57.1** (genotype-nonspecific) maps to HCC 107 at RAF 0.457 (CNA). If the patient is actually HbSC (correct code **D57.20**, HCC 108 at RAF 0.146), this is a **3.1x RAF inflation** and a documented coding error. (**2**) No confirmatory test referenced: the chart misrepresents disease severity **without laboratory verification**. (**3**) No treatment details, lab values, adherence data, comorbidity staging, or functional assessment documented. **No MEAT elements** present beyond a bare diagnosis label.

RAF Impact: Inappropriate RAF inflation; coding does not align with clinical severity. **Auditable risk** if genotype is later confirmed as non-HbSS.

Fix: Order hemoglobin electrophoresis or HPLC; document the result; **reassign to correct D57.x** code (**D57.20** if HbSC confirmed, **D57.1** if confirmed HbSS); update problem list with genotype-specific entry. **Corrected documentation**: "**D57.20**: HbSC sickle cell disease without crisis (HPLC confirmed [date]). On hydroxyurea 750 mg/day; MPR reviewed. ANC [value]; HbF [value]%. Renal function: eGFR [value] mL/min. PHQ-2 [score]. Annual TTE and ophthalmology [status]. Return [interval] or sooner for new symptoms." **Coding after fix**: **D57.20** (HCC 108) replaces **D57.1** (HCC 107) = genotype-accurate coding with full clinical picture preserved.

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