AAVBC

AMERICAN ACADEMY OF VALUE BASED CARE

Acute Leukemia

Quick Reference Guide

2026

Table of Contents

1. CLINICAL SNAPSHOT **3**
HCC/RAF V28 Mapping **3**
2. RECOGNITION AND DIAGNOSIS **6**
Diagnostic Workup Covered Under Medicare Part B (older adults, at-risk population) **6**
Subtle Early Signs in Older Adults **6**
Risk Factors **7**
Diagnostic Thresholds **8**
Key Distinguishing Features Between Acute and Chronic Leukemias **8**
Common Oversights **10**
Key Differentials in Elderly **11**
Comorbidity Screening **12**
Staging and Risk Stratification Systems for AML and ALL **13**
3. MEAT DOCUMENTATION ESSENTIALS **18**
Reframing Common Documentation Shortcuts **19**
4. TREATMENT AND REFERRAL QUICK GUIDE **19**
Therapy Escalation Criteria **20**
NCCN/ASH 2025 Aligned Recommendations **20**
Non-Pharmacologic Treatment and Lifestyle Modification **21**
Non-Pharmaceutical Prevention Strategies **22**
Medication Safety Considerations **22**
When to Refer **23**
Follow-Up Timing **24**
Comorbidity Management **24**
Cost-Smart Options **25**
Patient Education and Adherence **26**
Quality Metrics Tie-In **27**
5. CODING REMINDERS AND CASE EXAMPLES **29**
Documentation Specificity **29**
Annual Clinical Review and Confirmation **30**
Good Documentation is Comprehensive Coding **30**
EHR Workflow Tips **31**
Brief Case Examples **31**
REFERENCES **32**

1 CLINICAL SNAPSHOT

Definition: Acute leukemias are a group of rapidly progressing **hematologic malignancies** characterized by uncontrolled clonal proliferation of immature blood cells (blasts) in the bone marrow, resulting in profound cytopenias and **failure of normal hematopoiesis**. The two principal adult subtypes are acute myeloid leukemia (**AML**) and acute lymphoblastic leukemia (**ALL**).

ICD-10 Codes

AML (HCC 17): C92.0x (AML, not elsewhere classified), C92.3x (myeloid sarcoma), C92.5x (acute myelomonocytic leukemia), C92.6x (acute myeloid leukemia with 11q23-abnormality), C92.Ax (acute myeloid leukemia with multilineage dysplasia), C93.0x (acute monoblastic/monocytic leukemia), C94.0x (acute erythroid leukemia), C94.2x (acute megakaryoblastic leukemia), C94.4x (acute panmyelosis with myelofibrosis), C92.4x (acute promyelocytic leukemia). **ALL** (**HCC 18**): C91.0x (acute lymphoblastic leukemia). **Unspecified Acute Leukemia (HCC 18)**: C95.0x (acute leukemia of unspecified cell type = **AVOID** when subtype is known).

For all acute leukemia ICD-10 codes, **a 6th character is required**, and omitting this character produces an unspecified code that may map to a **lower-weighted HCC**: **0** = not in remission, **1** = in remission, **2** = in relapse. **Example**: **C94.00** acute erythroid leukemia, not having achieved remission.

Prevalence: ~22,010 new **AML** diagnoses/year[1] and ~6,500 new **ALL** diagnoses/year in the U.S.[2] Median age at AML diagnosis **68–69 years**;[1] annual AML incidence reaches 17.3 per 100,000 in adults ≥70 and 5-year overall survival is ~62% in patients <50 but **falls to ~9.4%** in those **≥65**;[3] 5-year OS for adult ALL >60 is **<20–30%**;[4] **Inpatient utilization** dominates acute leukemia costs in both AML and ALL. For AML, monthly per-patient costs nearly double post-relapse (~$23,000 in remission vs. ~$38,000 after relapse), with first salvage therapy reaching **~$172,000/month**.[5,6] For ALL, relapsed adults spend over half of follow-up time hospitalized, with relapse-related admissions averaging **$132,000**; pre-transplant cancer-related costs in ALL (**$462,000**) exceed all other hematologic malignancies.[7,8] These data underscore that delayed detection and relapsed disease disproportionately amplify hospital-driven expenditures across both subtypes.

HCC/RAF V28 Mapping

ICD-10 CODE(S)[9]	HCC CATEGORY (V28)[10]	RAF WEIGHT (CNA)[11]	DOCUMENTATION REQUIREMENT[9]
C92.0(0/1/2) (AML) **C92.3(0/1/2)** **C92.5(0/1/2)** **C92.6(0/1/2)** **C92.A(0/1/2)** **C93.0(0/1/2)**	**HCC 17** Cancer Metastatic to Lung/Liver/Brain; **AML** Except Promyelocytic	4.209	Specify AML subtype per pathology; document remission status (**0**/**1**/**2**) at each encounter; confirm active disease annually via MEAT; **do not** use Z85.6 while on any active therapy

ICD-10 CODE(S)[9]	HCC CATEGORY (V28)[10]	RAF WEIGHT (CNA)[11]	DOCUMENTATION REQUIREMENT[9]
C94.00 (acute erythroid leukemia) C94.20 (acute megakaryoblastic) C94.40 (acute panmyelosis w/ myelofibrosis)	**HCC 18** Cancer Metastatic to Bone/Other and Unspecified Metastatic Cancer; **Acute Leukemia Except Myeloid**	2.341	Rare subtypes = confirm lineage with hematopathology; document remission status (**0**/**1**/**2**) at each encounter; specify morphologic subtype per WHO/ICC classification
C91.0(0/1/2) (ALL)	**HCC 18** Cancer Metastatic to Bone/Other and Unspecified Metastatic Cancer; **Acute Leukemia Except Myeloid**	2.341	Specify ALL (**not** "acute leukemia"); document remission status (**0**/**1**/**2**) at each encounter; ALL maintenance spans 2.5–3 yr: code as active disease throughout, **not** Z85.6
C95.0(0/1/2) (acute leukemia, unspecified cell type)	**HCC 18** Cancer Metastatic to Bone/Other and Unspecified Metastatic Cancer; **Acute Leukemia Except Myeloid**	2.341	**AVOID** once AML vs. ALL is pathologically confirmed; replace with lineage-specific code (C92.0x or C91.0x); unspecified coding **forecloses** HCC 17 mapping for AML
C92.4(0/1/2) (Acute Promyelocytic Leukemia; APL)	**HCC 18** Cancer Metastatic to Bone/Other and Unspecified Metastatic Cancer; **Acute Leukemia Except Myeloid**	2.341	Distinct, **curable** AML subtype; document PML::RARA confirmation; note remission status (**0**/**1**/**2**) at each encounter
Z85.6 (personal history of leukemia)	**No HCC**	–	Use **ONLY** after all treatment is completed **AND** no active therapy of any kind (including maintenance chemotherapy, palliative transfusions, or oncology surveillance monitoring)

ABBREVIATIONS: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; APL = acute promyelocytic leukemia; CMS = Centers for Medicare & Medicaid Services; CNA = Community Non-Dual Eligible, Aged; HCC = Hierarchical Condition Category; MEAT = Monitor/Evaluate/Assess/Treat; RAF = Risk Adjustment Factor

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

Risk-Adjusted Care Resources per Patient/Year[3,4]

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

AML	ALL
~$43.8K+	**~$24.4K+**
HCC 17 · RAF 4.209 + chemo costs	HCC 18 · RAF 2.341 +chemo costs

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

AAVBC PERSPECTIVE

***From the AAVBC's perspective**, value-based care in acute leukemia should focus on optimizing survival, reducing relapse risk, preserving functional independence, and improving quality of life through **clinically individualized care** rather than rigid, one-size-fits-all treatment pathways. In both AML and ALL, this includes **frailty-guided therapy intensity**, early integration of **palliative care** for symptom management and supportive services, assessment of **medication affordability** and access barriers, and development of **closed-loop care pathways** linking hematology specialists, PCPs, infusion services, transfusion support, and home or outpatient monitoring programs. The hematology community is increasingly shifting toward integrated delivery models and **outpatient-based management** for appropriate phases of disease to reduce avoidable hospitalizations, treatment toxicity, and fragmentation of care while maintaining clinical outcomes. **AAVBC emphasizes** that treatment decisions in older or medically complex patients should incorporate functional status, comorbidities, caregiver support, polypharmacy, and patient goals alongside disease biology to deliver care that is both evidence-based and patient-centered.*

2 RECOGNITION AND DIAGNOSIS

Diagnostic Workup Covered Under Medicare Part B (older adults, at-risk population)

TEST	FREQUENCY	CPT CODE	CLINICAL INDICATION[12–15]
CBC with differential	As clinically indicated; at any unexplained symptom	85025	Unexplained fatigue, recurrent infection, bleeding, bruising, cytopenias, or WBC **>50,000/µL** with abnormal differential
Peripheral blood smear review	When CBC abnormal or blasts suspected*	85060	Confirm presence of blasts, atypical lymphocytes, or dysplastic features on automated CBC flag
Comprehensive metabolic panel (CMP)	At diagnosis and during active therapy	80053	Baseline renal/hepatic function; TLS monitoring (K^+, uric acid, phosphate, calcium)
LDH and uric acid	At diagnosis and pre-therapy	83615/ 84550	Tumor burden assessment; TLS risk stratification

ABBREVIATIONS: CBC = complete blood count; CMP = comprehensive metabolic panel; CPT = current procedural terminology; LDH = lactate dehydrogenase; TLS = tumor lysis syndrome; WBC = white blood cell
***Test covered under Medicare Part B when flagged by CBC test results**

Subtle Early Signs in Older Adults

SIGN/SYMPTOM[12–15]	CLINICAL SIGNIFICANCE[3,12–15]
Unexplained fatigue, pallor, exertional dyspnea	Anemia from marrow replacement by blasts; often misattributed to age or cardiac disease in older adults
Easy bruising, petechiae, gum/nasal bleeding	Thrombocytopenia; petechiae on **lower extremities** or **palate** are early tell-tale signs
Recurrent or severe infection, persistent fever ≥38.0°C	Functional neutropenia despite normal or elevated WBC count; any fever warrants same-day workup[16]

SIGN/SYMPTOM[12–15]	CLINICAL SIGNIFICANCE[3,12–15]
Bone or joint pain, especially sternal tenderness	Marrow expansion from blast infiltration; classic but underreported in geriatric presentations
Night sweats, unintentional weight loss	Systemic disease burden; often confused with occult infection or other malignancy
Hepatosplenomegaly or painless lymphadenopathy (ALL)	Extramedullary disease; more common in ALL than AML[17]

ABBREVIATIONS: WBC = white blood cell count; ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia

Risk Factors

FACTOR[14,15,18,19]	RISK SIGNAL	NOTES[14,15,18,19]
Prior MDS or MPN diagnosis	**~30-40%** of MDS cases progress to AML[20]	Document prior hematologic diagnosis and any prior HMA exposure = affects treatment response at AML onset
Clonal hematopoiesis of indeterminate potential (CHIP)	Prevalence ~10% in adults >65 (DNMT3A, TET2, ASXL1)[21]	Confers **2-fold** increased cardiovascular risk independent of leukemia treatment
Prior cytotoxic chemotherapy or radiation	Therapy-related AML (t-AML) risk	Document prior oncologic history; t-AML carries adverse cytogenetic profile; NCCN classifies t-AML as poor/adverse-risk[15]
Benzene or petrochemical exposure (occupational)	Established environmental risk factor for AML/MDS[22]	Document occupational history at intake; relevant for disability/VA disposition
Down syndrome or inherited bone marrow failure syndrome	DS: **~150-fold** increased AML risk before age 4; **10–20-fold** increased ALL risk; IBMFS (Fanconi anemia, SDS, DBA, DC): 5–10% lifetime MDS/AML risk[23,24]	Document congenital condition; informs risk-adapted treatment

ABBREVIATIONS: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; ECOG = Eastern Cooperative Oncology Group performance status; GA = geriatric assessment; HMA = hypomethylating agent; MDS = myelodysplastic syndrome; MPN = myeloproliferative neoplasm; t-AML = therapy-related AML; VA = Veterans Affairs

Diagnostic Thresholds

TEST/MARKER[12–15]	DIAGNOSIS CRITERION	NOTES
Peripheral blood blasts	Any circulating blasts on smear	Triggers same-day hematology contact; **do not wait** for bone marrow to initiate referral[25]
Bone marrow blast percentage	≥20% blasts = acute leukemia (WHO)[26]	AML-defining genetic abnormalities (e.g., **t(8;21)**, **inv(16)**, **t(15;17)** for APL) diagnose AML regardless of blast count[3]
Cytogenetic analysis	Required at diagnosis (ASH Measure #1)	Guides ELN 2022 risk stratification (favorable/intermediate/adverse)[27]
Flow cytometry/ immunophenotyping	**Required** at diagnosis	Distinguishes AML from ALL; confirms lineage for ambiguous morphology[2,3]
Molecular testing (FLT3, NPM1, IDH1/2, CEBPA, TP53)	**Required** for AML risk stratification and targeted therapy eligibility	FLT3-ITD, TP53 mutations define adverse risk; IDH1/IDH2 eligible for targeted agents

ABBREVIATIONS: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; aPTT = activated partial thromboplastin time; APL = acute promyelocytic leukemia; ATRA = all-trans retinoic acid; DIC = disseminated intravascular coagulation; ELN = European LeukemiaNet; FLT3-ITD = FLT3 internal tandem duplication; IDH = isocitrate dehydrogenase; NPM1 = nucleophosmin 1; PT = prothrombin time; WHO = World Health Organization

Key Distinguishing Features Between Acute and Chronic Leukemias

FEATURE	AML[3,15,25,28]	CML[25,29,30]
Definition	**≥20%** myeloblasts (BM/PB); exceptions for AML-defining genetics	**5%** in chronic phase; **10–19%** accelerated (AP); **≥20%** blast phase (BP)
Epidemiology	Median age **68**; incidence rises with age	Median age **~55**; slight male predominance
Presentation	Fatigue, infection, bleeding; gingival hyperplasia (monocytic); **Auer rods** on smear	~50% **asymptomatic**; marked leukocytosis with left shift; basophilia; massive splenomegaly
Immunophenotype	MPO+, CD13+, CD33+, CD117+; HLA-DR+ (negative in APL)	Mature granulocytic series; flow cytometry needed only in AP/BP

FEATURE	AML[3,15,25,28]	CML[25,29,30]
Genetics	FLT3, NPM1, CEBPA, t(8;[21]), inv(16), t(15;[17]) [PML::RARA]	t(9;22)(q34;q11.2) BCR::ABL1 (**>95%**); monitor by qPCR (IS)
Workup	BM aspirate + flow cytometry + cytogenetics + NGS molecular panel	PB or BM cytogenetics + **qPCR for BCR::ABL1**
	ALL[12–14,25]	**CLL**[25,31]
Definition	**≥20%** lymphoblasts (BM)	**≥5×10^9/L** monoclonal B lymphocytes (PB) by flow cytometry
Epidemiology	Bimodal: children ~5 y; second peak **>50 y**	Older adults; 70% diagnosed **after age 65**
Presentation	Bone/joint pain (children); lymphadenopathy; hepatosplenomegaly; CNS involvement (~5–8% adults)	~70% **asymptomatic**; lymphocytosis; lymphadenopathy; modest splenomegaly
Immunophenotype	B-ALL: CD19+, CD10+, CD22+, TdT+; T-ALL: cCD3+, CD7+, TdT+	CD5+, CD19+, CD20 dim, CD23+, CD200+; kappa/lambda restriction
Genetics	BCR::ABL1 (Ph+), KMT2A-r, ETV6::RUNX1, hyperdiploidy, hypodiploidy	del(13q), +12, del(11q), del(17p); IGHV mutation status; TP53
Workup	BM aspirate + flow cytometry + karyotype + FISH/RT-PCR for BCR::ABL1 + NGS	PB flow cytometry (CD5/CD19/CD23/CD200/kappa/lambda); **BM biopsy not required**

ABBREVIATIONS: AML = acute myeloid leukemia; CML = chronic myeloid leukemia; BM = bone marrow; PB = peripheral blood; CP = chronic phase; AP = accelerated phase; BP = blast phase; MPO = myeloperoxidase; HLA-DR = human leukocyte antigen–DR isotype; APL = acute promyelocytic leukemia; FLT3 = fms-like tyrosine kinase 3; NPM1 = nucleophosmin 1; CEBPA = CCAAT/enhancer-binding protein alpha; PML::RARA = promyelocytic leukemia–retinoic acid receptor alpha fusion; BCR::ABL1 = breakpoint cluster region–Abelson murine leukemia viral oncogene homolog 1 fusion; qPCR = quantitative polymerase chain reaction; IS = International Scale; NGS = next-generation sequencing; ALL = acute lymphoblastic leukemia; CLL = chronic lymphocytic leukemia; CNS = central nervous system; TdT = terminal deoxynucleotidyl transferase; cCD3 = cytoplasmic CD3; Ph = Philadelphia chromosome; KMT2A-r = KMT2A-rearranged; IGHV = immunoglobulin heavy chain variable region; FISH = fluorescence in situ hybridization; RT-PCR = reverse transcriptase polymerase chain reaction; TP53 = tumor protein p53

Common Oversights

OVERSIGHT/SHORTCUT	WHY IT MATTERS — WHAT TO DO INSTEAD[3,12–15]
Attributing fatigue, bruising, or gingival bleeding to benign causes without obtaining a CBC with differential and peripheral smear	AML can present with isolated gingival hyperplasia or **mucocutaneous bleeding** even with a near-normal CBC;[32] absence of blasts on smear **does not** exclude acute leukemia;[25] any unexplained cytopenia, refractory gingival enlargement, or new petechiae warrants CBC with differential, smear review, and hematology referral
Failing to suspect APL and emergently initiate ATRA	ATRA must begin at first morphologic suspicion, **before cytogenetic confirmation**; delayed ATRA (>24 h) is associated with **~3-fold** increase in early hemorrhagic mortality;[33] suspect APL when promyelocytes with multiple Auer rods, spontaneous DIC, or $CD34^-$/$HLA\text{-}DR^-$ immunophenotype are present
Not recognizing or urgently managing leukostasis in hyperleukocytosis	Leukostasis (dyspnea, hypoxemia, confusion, focal deficits) carries **20–40%** first-week mortality;[34] WBC **>100×10^9/L** defines hyperleukocytosis, though monocytic AML may manifest at **>50×10^9/L**; initiate hydroxyurea immediately; avoid RBC transfusion until WBC is reduced; **prompt definitive induction essential**
Omitting CNS evaluation and prophylaxis in adult ALL	Without CNS-directed therapy, **>50%** of ALL patients develop CNS leukemia;[14] all ALL regimens **must** include CNS prophylaxis (systemic HD-MTX/cytarabine + IT therapy); with chemoimmunotherapy backbones (blinatumomab, inotuzumab), IT doses may need to increase to ≥15 to prevent unmasked CNS relapse[35]
Delaying or omitting molecular/cytogenetic testing that determines treatment selection	**FLT3-ITD/TKD** determines midostaurin/quizartinib eligibility (AML); **BCR::ABL1** determines TKI use (ALL); CAP/ASH recommends integrated reporting **within 2 weeks**;[12,13] **do not** begin AML induction without at least FLT3 and cytogenetics, as this forecloses targeted agent addition
Defaulting to intensive induction in older/unfit AML without fitness assessment	**Chronological age alone is inadequate**;[1] NCCN recommends evaluating PS, comorbidities, and organ function for patients ≥60;[15] ASH recommends HMA + venetoclax over HMA alone for patients **unfit for conventional induction**;[36] document rationale for intensity selection including ECOG PS and comorbidity burden
Not coding complications (DIC, TLS, febrile neutropenia) alongside the leukemia	Complications carry independent clinical and coding significance; code each: **D65** (DIC), **E88.3** (TLS), **D70.1** + **R50.81** (febrile neutropenia), **D61.810** (pancytopenia)

OVERSIGHT/SHORTCUT	WHY IT MATTERS — WHAT TO DO INSTEAD[3,12–15]

ABBREVIATIONS: CBC = complete blood count; AML = acute myeloid leukemia; APL = acute promyelocytic leukemia; ATRA = all-trans retinoic acid; DIC = disseminated intravascular coagulation; HLA-DR = human leukocyte antigen–DR isotype; WBC = white blood cell count; RBC = red blood cell; CNS = central nervous system; ALL = acute lymphoblastic leukemia; HD-MTX = high-dose methotrexate; IT = intrathecal; FLT3-ITD/TKD = FMS-like tyrosine kinase 3–internal tandem duplication/tyrosine kinase domain; BCR::ABL1 = breakpoint cluster region–Abelson murine leukemia viral oncogene homolog 1 fusion; TKI = tyrosine kinase inhibitor; CAP = College of American Pathologists; ASH = American Society of Hematology; NCCN = National Comprehensive Cancer Network; PS = performance status; HMA = hypomethylating agent; ECOG = Eastern Cooperative Oncology Group; TLS = tumor lysis syndrome

Key Differentials in Elderly

PRESENTATION	DIFFERENTIAL	KEY TESTS[14,15,18,35,37,38]
Pancytopenia with fatigue and infection	Myelodysplastic syndrome (**MDS**), aplastic anemia, drug-induced marrow suppression	Bone marrow aspirate with cytogenetics; medication reconciliation; B12/folate levels[3]
Leukocytosis with left shift and fever	Leukemoid reaction (severe infection), chronic myeloid leukemia (**CML**), chronic lymphocytic leukemia (**CLL**)	Peripheral smear for blasts vs. bands; LAP score; **BCR-ABL qPCR**; flow cytometry
Isolated anemia in older adult	Anemia of chronic disease, iron deficiency, B12/folate deficiency, MDS, early AML	Reticulocyte count, iron studies, B12/folate; bone marrow if persistent or progressive
Bleeding or petechiae with thrombocytopenia	ITP, TTP, DIC from sepsis, drug-induced thrombocytopenia, APL	Coagulation panel with D-dimer and fibrinogen; peripheral smear for schistocytes or blasts
Bone pain in older adult with cytopenias	Multiple myeloma, metastatic bone disease, AML with marrow infiltration	**SPEP/UPEP** with free light chains; skeletal imaging; bone marrow biopsy

ABBREVIATIONS: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; APL = acute promyelocytic leukemia; BCR-ABL = breakpoint cluster region–Abelson fusion gene; CLL = chronic lymphocytic leukemia; CML = chronic myeloid leukemia; DIC = disseminated intravascular coagulation; ITP = immune thrombocytopenia; LAP = leukocyte alkaline phosphatase; MDS = myelodysplastic syndrome; SPEP = serum protein electrophoresis; TB = tuberculosis; TTP = thrombotic thrombocytopenic purpura; UPEP = urine protein electrophoresis

CLINICAL PEARL — CLUES TO DIG DEEPER

New, unexplained **pancytopenia** is the hallmark presentation of bone marrow failure from acute leukemia in older adults and should never be dismissed as '**age-related**' or a presumed infectious delay diagnosis.[39] A peripheral blood smear with CBC and differential takes minutes; circulating blasts, Auer rods, or unexplained immature granulocytes warrant same-day hematology contact and bone marrow biopsy, not watchful waiting.[15,25] **This single low-cost screening step** is the gateway to timely risk stratification, targeted therapy selection, and avoidance of downstream emergency presentations (leukostasis, DIC, TLS) that drive preventable inpatient utilization.

Comorbidity Screening

CONDITION	PREVALENCE IN THIS POPULATION[15,36,36,40]	SCREENING APPROACH[15,36,36,40]
Cardiovascular disease/LV dysfunction	CVD associated with mOS 26 vs. 12 mo (p=0.005); LVEF ≤50% **excludes** intensive 7+3 induction (Ferrara criteria)[39]	Baseline echocardiogram before anthracycline therapy; cardiology co-management if prior CAD or HF[39]
Cognitive impairment	MMSE dysfunction predicts grade 3–4 infections and prolonged hospitalization ≥40 days (p=0.005)[41]	Mini-Cog (2–3 min) at initial assessment; MoCA if screen-positive[40]
Depression	Depressive symptoms associated with inferior OS (p=0.048); 64% baseline positive screen in elderly AML	GDS-4 or PHQ-2 (<2 min); PHQ-9 if positive; treat as part of supportive care
Renal impairment (CrCl <45 mL/min)	**Excludes** intensive 7+3 induction	Baseline CrCl; dose adjust cytarabine per NCCN (≥2 g/m^2 contraindicated in renal failure); LDAC + glasdegib is an approved option in advanced CKD
Frailty and functional decline	SPPB <9 predicts inferior OS (p=0.027); Fried phenotype: 2-yr OS 57% fit/42% pre-frail/21% frail	SPPB (<5 min) pre-treatment and at intensification points; add gait speed and grip strength[42]

ABBREVIATIONS: AKI = acute kidney injury; AML = acute myeloid leukemia; CAD = coronary artery disease; CKD = chronic kidney disease; CrCl = creatinine clearance; CVD = cardiovascular disease; CYP3A4 = cytochrome P450 3A4; GDS-4 = Geriatric Depression Scale 4-item; HF = heart failure; HR = hazard ratio; LDAC = low-dose cytarabine; LV = left ventricular; LVEF = left ventricular ejection fraction; MMSE = Mini-Mental State Examination; MoCA = Montreal Cognitive Assessment; mOS = median overall survival; OS = overall survival; PHQ = Patient Health Questionnaire; SPPB = Short Physical Performance Battery

Staging and Risk Stratification Systems for AML and ALL

Unlike solid tumors, acute leukemias (AML and ALL) **do not** use traditional TNM staging. Instead, the gold standard in US practice is **genetic/molecular risk stratification**, which directly determines treatment intensity and post-remission strategy.[27]

Gold Standard Risk Stratification - AML (ELN 2022)

RISK CATEGORY[27]	KEY GENETIC ABNORMALITIES[27]	EXPECTED OUTCOMES (INTENSIVE TX)[27]	TREATMENT IMPLICATIONS[27]
Favorable	t(8;21)/RUNX1::RUNX1T1; inv(16)/CBFB::MYH11; mutated NPM1 without FLT3-ITD; bZIP in-frame mutated CEBPA	**Younger**: CR ~86%, 3-yr OS ~75%; **Age >60**: CR ~81%, 3-yr OS ~45%	Consolidation chemotherapy (HiDAC ± GO); HCT generally **not recommended** in CR1 unless MRD+
Intermediate	NPM1 with FLT3-ITD; wild-type NPM1 with FLT3-ITD (no adverse lesions); t(9;11)/MLLT3::KMT2A; abnormalities not classified as favorable or adverse	**Younger**: CR ~59%, 3-yr OS ~45%; **Age >60**: CR ~50%, 3-yr OS ~18%	HCT considered on **case-by-case basis**; MRD status critical for HCT decision
Poor/ Adverse	Complex/monosomal karyotype; -5/del(5q), -7, -17/abn(17p); KMT2A-r (non-t[9;11]); BCR::ABL1; inv(3); mutated TP53 (VAF ≥10%); myelodysplasia-related mutations (ASXL1, BCOR, EZH2, RUNX1, SF3B1, SRSF2, STAG2, U2AF1, ZRSR2)	**Younger**: CR ~49%, 3-yr OS ~28%; **Age >60**: CR ~32%, 3-yr OS ~4%	HCT preferred in CR1; TP53-mutated → **clinical trial recommended**; CPX-351 preferred for therapy-related/MDS-related AML age ≥60

ABBREVIATIONS: TX = treatment; CR = complete remission; OS = overall survival; HiDAC = high-dose cytarabine; GO = gemtuzumab ozogamicin; HCT = hematopoietic cell transplantation; CR1 = first complete remission; MRD = measurable residual disease; FLT3-ITD = FLT3 internal tandem duplication; KMT2A-r = KMT2A-rearranged; BCR::ABL1 = breakpoint cluster region–Abelson murine leukemia viral oncogene homolog 1 fusion; TP53 = tumor protein p53; VAF = variant allele frequency; ASXL1 = additional sex combs-like 1; BCOR = BCL6 corepressor; EZH2 = enhancer of zeste homolog 2; RUNX1 = RUNX family transcription factor 1; SF3B1 = splicing factor 3b subunit 1; SRSF2 = serine/arginine-rich splicing factor 2; STAG2 = stromal antigen 2; U2AF1 = U2 small nuclear RNA auxiliary factor 1; ZRSR2 = zinc finger CCCH-type, RNA binding motif and serine/arginine rich 2; CPX-351 = liposomal daunorubicin-cytarabine; MDS = myelodysplastic syndrome; AML = acute myeloid leukemia; NPM1 = nucleophosmin 1; CEBPA = CCAAT/enhancer-binding protein alpha; CBFB::MYH11 = core-binding factor subunit beta–myosin heavy chain 11 fusion; RUNX1::RUNX1T1 = RUNX family transcription factor 1–RUNX1 partner transcriptional co-repressor 1 fusion; MLLT3::KMT2A = MLLT3 super elongation complex subunit–lysine methyltransferase 2A fusion

Gold Standard Risk Stratification - B-ALL (NCCN Cytogenetic/Molecular)

RISK CATEGORY[14]	KEY CYTOGENETIC/MOLECULAR ALTERATIONS[14]	TREATMENT IMPLICATIONS[14]
Standard risk	**Hyperdiploidy (51–65 chromosomes)**; t(12;21)/ETV6::RUNX1; t(1;19)/TCF3::PBX1; DUX4-r; PAX5 P80R; BCR::ABL1 without IKZF1-plus and without antecedent CML	Consolidation chemotherapy + blinatumomab (preferred per ECOG 1910); HCT **considered** if MRD persists
Poor risk	**Hypodiploidy (44 chromosomes)**; TP53 mutation; KMT2A-r; Ph-like ALL (JAK-STAT, ABL class); BCR::ABL1 with IKZF1-plus or antecedent CML; iAMP21; IKZF1 alterations; complex karyotype (≥5 abnormalities); IgH-r, HLF-r, MYC-r, ZNF384-r, MEF2D-r, PAX5alt	HCT favored in CR1, especially with slow/incomplete MRD clearance; blinatumomab for MRD+ disease

ABBREVIATIONS: ETV6::RUNX1 = ETS variant transcription factor 6–RUNX family transcription factor 1 fusion; TCF3::PBX1 = transcription factor 3–pre-B-cell leukemia transcription factor 1 fusion; DUX4-r = DUX4-rearranged; PAX5 = paired box 5; BCR::ABL1 = breakpoint cluster region–Abelson murine leukemia viral oncogene homolog 1 fusion; IKZF1 = IKAROS family zinc finger 1; CML = chronic myeloid leukemia; ECOG = Eastern Cooperative Oncology Group; HCT = hematopoietic cell transplantation; MRD = measurable residual disease; TP53 = tumor protein p53; KMT2A-r = KMT2A-rearranged; Ph = Philadelphia chromosome; ALL = acute lymphoblastic leukemia; JAK-STAT = Janus kinase–signal transducer and activator of transcription; ABL = Abelson murine leukemia viral oncogene; iAMP21 = intrachromosomal amplification of chromosome 21; IgH-r = immunoglobulin heavy chain–rearranged; HLF-r = hepatic leukemia factor–rearranged; MYC-r = MYC proto-oncogene–rearranged; ZNF384-r = zinc finger protein 384–rearranged; MEF2D-r = myocyte enhancer factor 2D–rearranged; PAX5alt = PAX5 alterations; CR1 = first complete remission

Alternative Staging/Severity Metrics Used in US Practice

METRIC	APPLIES TO	WHAT IT MEASURES	CLINICAL ROLE IN US PRACTICE
MRD by MFC ($\geq 10^{-3}$)[14,15]	AML and ALL	Residual leukemic cells by flow cytometry after morphologic CR	Prognostic: MRD^- vs. MRD^+ → 5-yr OS 68% vs. 34% (AML); strongest relapse predictor in ALL; guides HCT decisions and post-remission therapy
MRD by NGS ($\geq 10^{-5}$ to 10^{-6})[14,15]	AML (FLT3-ITD) and ALL	Ultra-sensitive detection of clonal rearrangements or mutations	NCCN recommends NGS-based MRD for FLT3-ITD AML; preferred method in ALL (FDA-approved Ig/TCR assay); confirms negativity when flow is negative
MRD by RQ-PCR ($\geq 10^{-4}$)[15]	AML (NPM1, CBF, PML::RARA)	Molecular transcript quantification for specific fusion genes	NCCN recommends serial monitoring q6–12 weeks × 24 months for NPM1, CBFB::MYH11, RUNX1::RUNX1T1; q3 months × 24 months for PML::RARA
WHO/ICC 2022 Classification[26,43]	AML and ALL	Morphologic, immunophenotypic, and genomic disease subtyping	Defines disease entities (e.g., AML with defining genetic abnormalities vs. AML defined by differentiation); complements ELN risk for diagnostic categorization

METRIC	APPLIES TO	WHAT IT MEASURES	CLINICAL ROLE IN US PRACTICE
NCI Risk Criteria (age/ WBC)[14]	B-ALL (**primarily pediatric**, applied in AYA)	Age 35 y + WBC 30×10^9/L (B-ALL) = standard risk; age ≥35 or WBC ≥30×10^9/L = high risk	Traditional clinical risk assignment; now largely **superseded by molecular classification** in adults but still used for initial stratification in some protocols
ECOG Performance Status[15]	AML and ALL	Functional status (0–4 scale)	Determines intensive induction eligibility; NCCN uses PS alongside comorbidities and organ function for fitness assessment in AML ≥60 y
Geriatric Assessment (SPPB, G8)[36,40]	AML (older adults)	Physical function, frailty, cognition, comorbidities	ASH recommends HMA + venetoclax over intensive induction for unfit patients; SPPB 9 predicts inferior OS
LSC17 Score[44,44]	AML	17-gene leukemic stem cell expression signature	Independently predicts CR, MRD, RFS, and OS beyond ELN 2022; high score identifies patients benefiting from HCT; emerging but not yet in guidelines

ABBREVIATIONS: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; APL = acute promyelocytic leukemia; AYA = adolescent and young adult; BM = bone marrow; CBF = core-binding factor; CML = chronic myeloid leukemia; CR = complete remission; CR1 = first complete remission; ELN = European LeukemiaNet; ETP = early T-cell precursor; FISH = fluorescence in situ hybridization; GO = gemtuzumab ozogamicin; HCT = hematopoietic cell transplantation; HiDAC = high-dose cytarabine; HMA = hypomethylating agent; iAMP21 = intrachromosomal amplification of chromosome 21; ICC = International Consensus Classification; MFC = multicolor flow cytometry; MRD = measurable residual disease; NCCN = National Comprehensive Cancer Network; NCI = National Cancer Institute; NGS = next-generation sequencing; OS = overall survival; Ph = Philadelphia chromosome; PS = performance status; RFS = relapse-free survival; RQ-PCR = real-time quantitative polymerase chain reaction; SPPB = Short Physical Performance Battery; TKI = tyrosine kinase inhibitor; TX = treatment; VAF = variant allele frequency; WBC = white blood cell; WHO = World Health Organization

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

These emergency conditions require **same-day specialist or ED referral** for patients with known or suspected acute leukemia:

- **Suspected APL with coagulopathy (DIC)**
  - → Start ATRA immediately upon first morphologic suspicion, **do not** wait for cytogenetic confirmation; maintain platelets ≥50×10^9/L and fibrinogen >150 mg/dL with aggressive transfusion support; avoid central line placement during active coagulopathy
  - × **Delayed ATRA initiation is independently associated with early hemorrhagic death**
- **Hyperleukocytosis with leukostasis** (WBC >100×10^9/L with dyspnea, hypoxemia, confusion, or focal neurologic deficits; monocytic AML may manifest at >50×10^9/L)
  - → Initiate hydroxyurea immediately; avoid RBC transfusion until WBC is reduced; leukapheresis may be considered for symptomatic leukostasis
  - × **20–40% first-week mortality with leukostasis**
- **Febrile neutropenia (ANC <500/µL + temperature ≥38.3°C or ≥38.0°C sustained ≥1 hour)**
  - → Administer empiric broad-spectrum antipseudomonal antibiotics within 1 hour of triage (cefepime, meropenem, or piperacillin-tazobactam; **category 1**); obtain blood cultures but do not delay antibiotics for specimen collection
- **Tumor lysis syndrome (rising creatinine, hyperkalemia, hyperuricemia, hyperphosphatemia)**
  - → Aggressive IV hydration (1.5–2× maintenance); rasburicase for high-risk patients (WBC >100×10^9/L, elevated LDH >2× ULN, renal dysfunction); check **G6PD status** when feasible; continuous cardiac monitoring for hyperkalemia; consider hemodialysis/CRRT if electrolytes do not correct
- **Circulating blasts on peripheral smear or unexplained pancytopenia**
  - → Same-day hematology contact; do not wait for bone marrow confirmation to initiate referral; a single circulating blast is diagnostic until proven otherwise

⚠ RED FLAG — RAPID DECLINE/RATE-OF-CHANGE WARNING

Rapid clinical deterioration in a patient with known or suspected leukemia warrants immediate re-evaluation:

- **New confusion, altered mental status, severe headache, or focal neurologic deficits**
  - → Evaluate for CNS leukemia (LP with cytology/flow if safe), intracranial hemorrhage (emergent CT), or leukostasis; CNS involvement occurs in ~5–8% of adult ALL and requires urgent intrathecal therapy
- **Worsening dyspnea with pulmonary infiltrates in a patient on ATRA, IDH inhibitors, or menin inhibitors**
  - → Suspect **differentiation syndrome** = initiate dexamethasone 10 mg BID immediately; consider interrupting the offending agent until hypoxia resolves; IDH inhibitor–associated DS can occur up to several months after induction and is reported in ~19% of patients
- **Rising creatinine with hyperkalemia and hyperuricemia during or shortly after initiating therapy**
  - **Tumor lysis syndrome** = escalate hydration, administer rasburicase, and initiate continuous metabolic monitoring; consider nephrology consultation for CRRT if refractory
- **New petechiae, mucosal bleeding, or hematuria with worsening thrombocytopenia or coagulopathy**
  - → Evaluate for DIC (fibrinogen, D-dimer, PT/aPTT); in APL, maintain platelets ≥50×10^9/L and fibrinogen >150 mg/dL; in non-APL AML, transfuse platelets for counts <10×10^9/L or any active bleeding
- **Functional decline on active treatment in older adults**
  - → Expedited geriatric assessment to identify reversible causes (infection, delirium, polypharmacy, uncontrolled pain); reassess fitness for continued intensive therapy vs. transition to lower-intensity regimen (HMA + venetoclax)

AAVBC PERSPECTIVE

*Recognition of acute leukemia begins with **pattern awareness**, there is no population-level screening test. Unexplained fatigue, recurrent infections, easy bruising, and bone pain should **raise suspicion**, especially when paired with pallor, petechiae, or hepatosplenomegaly. In older adults, progressive fatigue is frequently misattributed to aging, delaying recognition. When a CBC reveals pancytopenia, circulating blasts, or severe unexplained cytopenia, **the pathway is clear**: peripheral smear review by a pathologist within 24–48 hours and expedited hematology referral for marrow evaluation. Care teams with standing workflows for abnormal CBC escalation and clear red-flag communication: fever with neutropenia, new blasts,*

> *unexplained bleeding = **reduce time-to-diagnosis**. Earlier recognition directly improves outcomes, particularly in acute promyelocytic leukemia where prompt treatment prevents fatal coagulopathy.*

3 MEAT DOCUMENTATION ESSENTIALS

Accurate acute leukemia documentation translates clinical complexity into a record that supports personalized care delivery, continuity, and appropriate care planning. The most common documentation failures are "history of" framing for active disease under treatment, under-coded treatment-related cytopenias, and omission of functional status trends that drive care planning. The MEAT framework below ties each element into appropriate clinical action:

*A 72-year-old female with ELN 2022 **intermediate-risk AML** on maintenance azacitidine + venetoclax (VIALE-A–based regimen) after lower-intensity induction, diagnosed 9 months ago. Presents for routine PCP follow-up; reports **fatigue**, **no fever**, **no new bleeding**. Oncology CBC two weeks prior: ANC 1,200, Hgb 10.2, platelets 92,000. SPPB declined from 9 to 7 over 3 months.*

MONITOR: "CBC from [date]: ANC 1,200/µL, Hgb 10.2 g/dL, platelets 92,000/µL. BMP within baseline. SPPB today = 7 (prior 9, 3 months ago). Venetoclax cycle 10, day 14; azacitidine 75 mg/m^2 SC days 1–7 at oncology infusion center."

EVALUATE: "Persistent cytopenias consistent with expected treatment effect, **not relapse**. No infectious signs, bleeding, or bone pain. Functional decline (SPPB 9 → 7) — gait speed and balance reduced; concerning cumulative treatment toxicity. No cognitive concerns per patient and daughter. Treatment goals and QoL priorities unchanged."

ASSESS: "1) AML (**C92.01**), ELN 2022 intermediate risk, complete remission on maintenance azacitidine + venetoclax per hematology (Dr. [Name], last seen [date]). 2) Chemotherapy-induced pancytopenia (D61.810). 3) Functional decline on treatment — geriatric reassessment indicated."

TREAT: "Continue oncology regimen as directed. Venetoclax adherence reinforced: with food, same time daily, no grapefruit; medication reconciliation confirms no new CYP3A4 inhibitors. PT referral for functional decline. ACP on file, reviewed, no changes. Return 6 weeks; call for fever ≥38.0°C or new bleeding."

Clinical Documentation Elements

- **Link clinical relationships:** Document the connection between leukemia and concurrent complications: e.g., 'Chemotherapy-induced pancytopenia (**D61.810**) due to maintenance therapy for AML (**C92.01**).' = supports the **severity of the clinical picture** and accurate coding of both the leukemia and its complications[15]
- **Include current data:** Document the most recent CBC with date (ANC, Hgb, platelets), basic metabolic panel, and functional measure (SPPB or ECOG); required **every encounter** during the reporting year[15]
- **Specify precisely:** Always state cell type (AML vs. ALL), ELN 2022 risk category when known, and 6th-character remission status; **avoid** 'acute leukemia unspecified' (**C95.0x**) once pathology has returned

- **Document chronicity:** Note diagnosis date, current cycle/phase of treatment, and duration in remission when applicable = distinguishes active surveillance from true 'history of' status[14,15]
- **Associated conditions:** List co-present complications: febrile neutropenia (**D70.1** + **R50.81**), TLS (**E88.3**), DIC (**D65**), anemia due to chemotherapy (**D64.81**); each carries independent clinical significance

Reframing Common Documentation Shortcuts

INSTEAD OF…	DOCUMENT…
'Acute leukemia'	'Acute myeloid leukemia (AML), ELN 2022 [risk], [6th-char status]'; **always** specify lineage and current remission status once known[14,15]
'History of leukemia' (while on maintenance)	'AML in complete remission on maintenance azacitidine + venetoclax': use C92.01, **not Z85.6**, until all active therapy has ended[14,15]
'AML, no treatment today'	'AML, active surveillance with defined monitoring interval: CBC every 4 weeks, bone marrow every 6 months per hematology'
'Fever and low counts'	'Febrile neutropenia: temperature 38.6°C, ANC 320/µL, on maintenance venetoclax for AML' (**D70.1** + **R50.81** + **C92.01**)[14,15]
'Doing fine on chemo'	'Patient tolerating cycle 10 of azacitidine + venetoclax; ANC 1,200, Hgb 10.2, platelets 92,000; SPPB 7 (declined from 9); advance care plan reviewed, no changes'

ABBREVIATIONS: AML = acute myeloid leukemia; ANC = absolute neutrophil count; CBC = complete blood count; ELN = European LeukemiaNet; MEAT = monitor/evaluate/assess/treat; SPPB = Short Physical Performance Battery

DOCUMENTATION IS COMPREHENSIVE CODING

Every active acute leukemia encounter should state the diagnosis with subtype specificity (**C91.01** ALL in remission; **C92.01** AML in remission), code treatment-related cytopenias (**D61.810**), record current functional status (ECOG, SPPB), describe the active management plan (regimen, cycle, dose modifications, toxicity), and list comorbidity linkages (tumor lysis prophylaxis, infection risk management, transfusion dependence **D64.81**, treatment-related fatigue **R53.0**, functional decline **Z74.09**). Each line of documentation corresponds to clinical work the care team is actually performing.

4 TREATMENT AND REFERRAL QUICK GUIDE

Acute leukemia management in older adults has shifted meaningfully over the last decade: the transition from uniform 7+3 induction to a **fitness-based decision** between intensive therapy and lower-intensity HMA + venetoclax represents the most consequential change in a generation, and it aligns directly with **value-based care goals** of delivering the right dose for the right patient while minimizing avoidable hospital utilization burden.[15,25,36]

Therapy Escalation Criteria

TRIGGER	ACTION
Circulating blasts on peripheral smear OR unexplained pancytopenia OR WBC >50,000/µL with abnormal differential	Same-day hematology contact; If patient **unstable** → ED transfer: initiate CBC, CMP, LDH, uric acid, coagulation panel, type and screen while arranging specialist contact[25]
Suspicion of APL (coagulopathy + blasts + fibrinogen <150)	**Hematology emergency**: Start ATRA immediately if available; arrange **immediate transfer** to specialized center; DIC management (cryoprecipitate, FFP, platelets) in parallel[15]
Febrile neutropenia (T ≥38.3°C once OR ≥38.0°C sustained AND ANC <500/µL)	Blood cultures × 2, urinalysis/culture, chest imaging; empiric broad-spectrum antibiotics **within 60 minutes** of recognition per NCCN[15]
TLS signs (rising creatinine, hyperkalemia, hyperuricemia, hypocalcemia) during venetoclax ramp-up	Aggressive IV hydration, rasburicase (**high-risk patients**), electrolyte correction, cardiac monitoring.; **hold or slow** venetoclax ramp per specialist[15]
Rapid SPPB decline, new falls, or functional loss on treatment	Reassess fitness and treatment goals; consider de-escalation or palliative care integration→ **full geriatric assessment**[42,45]

ABBREVIATIONS: ANC = absolute neutrophil count; APL = acute promyelocytic leukemia; ATRA = all-trans retinoic acid; CBC = complete blood count; CMP = comprehensive metabolic panel; DIC = disseminated intravascular coagulation; FFP = fresh frozen plasma; LDH = lactate dehydrogenase; NCCN = National Comprehensive Cancer Network; SPPB = Short Physical Performance Battery; TLS = tumor lysis syndrome; WBC = white blood cell count

NCCN/ASH 2025 Aligned Recommendations

CATEGORY	RECOMMENDED TREATMENT[14,15,36]	PCP ACTIONS[14,15,36]
AML, Fit patients (good functional status, no major organ dysfunction)	Intensive chemotherapy (7+3 regimen) ± targeted agents if specific mutations present (**FLT3**, **CD33**)	Confirm geriatric assessment completed for patients ≥60; expect **prolonged inpatient stays**; coordinate post-discharge follow-up; monitor for infection, bleeding, and transfusion needs between cycles

CATEGORY	RECOMMENDED TREATMENT[14,15,36]	PCP ACTIONS[14,15,36]
AML, Unfit or ≥75 or patient preference	Azacitidine + venetoclax (oral); outpatient-based regimen	Most common regimen PCPs will encounter at follow-up; monitor CBC trends, reinforce venetoclax adherence (take with food, avoid grapefruit, check for CYP3A4 drug interactions at every visit); watch for **tumor lysis syndrome** signs early in treatment
APL (a distinct, highly curable subtype; E92.4(0/1/2))	ATRA + arsenic trioxide; anthracycline added for high-WBC disease	Hematologic emergency: if APL is suspected (young patient, DIC, blasts on smear), initiate ATRA immediately and **refer same day**; cure rates exceed 90% with prompt treatment
ALL, Ph-negative	Intensive multi-agent chemotherapy; blinatumomab may be added	Patients ≥60 require significant **dose reductions** and closer **toxicity monitoring**; expect frequent lab checks; coordinate with oncology on neutropenic precautions and infection management
ALL, Ph-positive	Targeted oral TKI (dasatinib or ponatinib) + chemotherapy backbone; blinatumomab-based regimens in older adults	TKI-based therapy is generally **better tolerated** than intensive chemo in older patients; **PCP role**: medication reconciliation for TKI drug interactions, blood pressure monitoring (ponatinib), and cardiovascular risk assessment

ABBREVIATIONS: AML = acute myeloid leukemia; FLT3 = FMS-like tyrosine kinase 3; CD33 = cluster of differentiation 33; PCP = primary care provider; CBC = complete blood count; CYP3A4 = cytochrome P450 3A4; APL = acute promyelocytic leukemia; ATRA = all-trans retinoic acid; WBC = white blood cell count; DIC = disseminated intravascular coagulation; ALL = acute lymphoblastic leukemia; Ph = Philadelphia chromosome; TKI = tyrosine kinase inhibitor

Non-Pharmacologic Treatment and Lifestyle Modification

INTERVENTION	TARGET/RECOMMENDATION	NOTES
Geriatric assessment + targeted interventions	Every patient ≥60 years before treatment decisions	**G-8 screen** (4–5 min); SPPB, Mini-Cog, GDS-4 if screen **≤14**; GA-guided interventions reduced early mortality in phase II data[46]
Nutrition optimization	Mini Nutritional Assessment; dietitian referral if at-risk	At-risk status independently associated with mortality (HR 2.00) in older hematologic malignancies[47]
Physical function support	Physical therapy for SPPB <9; fall-prevention program	Gait-speed and sit-to-stand training; pre-habilitation before intensive therapy where feasible[42]

INTERVENTION	TARGET/RECOMMENDATION	NOTES
Early palliative care integration (concurrent, not end-of-life)	At diagnosis for all elderly patients with acute leukemia	**ASH 2025**: palliative care improves symptom burden and treatment tolerability; may access Part B palliative transfusions outside hospice[36]

ABBREVIATIONS: G-8 = Geriatric 8 screening tool; SPPB = Short Physical Performance Battery; GDS-4 = Geriatric Depression Scale 4-item; GA = geriatric assessment; HR = hazard ratio; ASH = American Society of Hematology

Non-Pharmaceutical Prevention Strategies

Acute leukemia is **not amenable** to primary prevention in most cases. Secondary prevention focuses on **reducing treatment-related mortality**: early recognition of febrile neutropenia, infection prophylaxis per specialist protocol, TLS prophylaxis (hydration, rasburicase, allopurinol), and cardioprotection with baseline echocardiography before anthracyclines. Surveillance of CHIP-positive patients for cardiovascular risk may reduce non-leukemia mortality in survivors.[3]

Medication Safety Considerations

AGENT/CLASS	INTERACTION/TOXICITY*	PCP ACTION
Venetoclax + strong azole antifungals (voriconazole, posaconazole)	**Venetoclax levels ↑ 5–6-fold;** prolonged severe cytopenias**; HIGH risk**	Verify oncology has reduced venetoclax by 75%; CBC weekly during co-administration; flag at every medication reconciliation
Venetoclax + moderate CYP3A4 inhibitors (diltiazem, verapamil, erythromycin, grapefruit juice)	Venetoclax levels ↑ ~2-fold; worsened cytopenias; MODERATE risk	Counsel to avoid grapefruit juice throughout therapy; flag diltiazem/ verapamil at medication reconciliation; increase CBC frequency
Anthracyclines (daunorubicin, idarubicin)	Cumulative cardiotoxicity; **HIGH risk if LVEF ≤50%** (contraindication)	Ensure baseline echocardiogram on file; reassess before each course; coordinate with cardio-oncology if EF borderline
High-dose cytarabine (≥2 g/m^2) in patients ≥60 or CrCl 45	Cerebellar neurotoxicity (nystagmus, slurred speech, gait instability**); HIGH risk**	Ask about new balance or coordination problems at every visit; report neurologic changes to oncology immediately
HMA + venetoclax in CKD (CrCl 45)	**Impaired uric acid clearance** → tumor lysis syndrome → AKI; HIGH risk	Confirm TLS prophylaxis in place during ramp-up; monitor daily uric acid + CMP during first cycle; AKI independently predicts worse OS (HR 1.86)

AGENT/CLASS	INTERACTION/TOXICITY*	PCP ACTION
Live vaccines during active therapy	Impaired immune response; risk of live-virus replication; **CONTRAINDICATED**	Defer all live vaccines during treatment; administer inactivated influenza and pneumococcal vaccines before initiation when feasible; document immunization history at diagnosis
Polypharmacy (≥5 medications) in older adults	**Unpredictable drug interactions**; adherence complexity; MODERATE–HIGH risk	Comprehensive medication reconciliation at every visit; pharmacist consult; deprescribe where possible; adherence check for venetoclax (take with food, same time daily)

ABBREVIATIONS: AKI = acute kidney injury; CBC = complete blood count; CKD = chronic kidney disease; CMP = comprehensive metabolic panel; CrCl = creatinine clearance; CYP3A4 = cytochrome P450 3A4; EF = ejection fraction; HMA = hypomethylating agent; HR = hazard ratio; LVEF = left ventricular ejection fraction; OS = overall survival; TLS = tumor lysis syndrome.
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

CRITERION[14,15,25,36]	SPECIALIST	URGENCY[14,15,25,36]
Circulating blasts on peripheral smear	Hematology/oncology	ASAP or refer to hospital
Unexplained pancytopenia, suspected marrow failure	Hematology/oncology	ASAP or refer to hospital
Coagulopathy + blasts (suspect APL)	Hematology emergency + ED	IMMEDIATE: start ATRA on suspicion
LVEF ≤50% before planned anthracycline therapy	Cardio-oncology	Before therapy initiation
Functional decline, frailty, or geriatric domain impairment	Geriatric oncology or geriatrics consult	Before treatment decision; and at intensification points

ABBREVIATIONS: APL = acute promyelocytic leukemia; ATRA = all-trans retinoic acid; ED = emergency department; LVEF = left ventricular ejection fraction

Follow-Up Timing

STAGE/ CATEGORY[14,15,25,36]	FREQUENCY	LABS TO MONITOR[14,15,25,36]
Active induction (fit, intensive)	**Daily inpatient**; CBC/CMP ≥ daily; coagulation daily if APL	CBC with diff, CMP, LDH, uric acid, coagulation panel (PT/aPTT/fibrinogen/ D-dimer)
Venetoclax ramp-up period (outpatient or brief inpatient)	CBC/CMP **2× weekly**; **daily** uric acid in high-risk TLS	CBC, CMP, uric acid, phosphate, calcium
Post-induction consolidation/ maintenance (HMA + venetoclax)	CBC **weekly** early; then every **2–4 weeks** per cycle	CBC, CMP, echocardiogram annually or before re-induction
Complete remission: post-treatment surveillance	Every **1–3 months** for first 2 years; every **6 months** thereafter (per oncology)	CBC with diff; bone marrow at specialist discretion; document remission status **each visit**
Best supportive care	Every **2–4 weeks** or per symptom-driven schedule	CBC to guide transfusion support; symptom burden assessment

ABBREVIATIONS: aPTT = activated partial thromboplastin time; APL = acute promyelocytic leukemia; CBC = complete blood count; CMP = comprehensive metabolic panel; HMA = hypomethylating agent; LDH = lactate dehydrogenase; MEAT = monitor/evaluate/assess/treat; PT = prothrombin time; TLS = tumor lysis syndrome

Comorbidity Management

COMORBIDITY[14,15,25,36]	APPROACH[14,15,25,36]	CAUTION[14,15,25,36]
Heart failure/LV dysfunction	Avoid anthracyclines if **LVEF ≤50%**; select HMA + venetoclax or FLAG-based therapy	Baseline echo mandatory; cardiology co-management[39]
Chronic kidney disease (CrCl <45 mL/ min)	LDAC + glasdegib is an approved option; dose-adjust cytarabine; careful TLS prophylaxis	AKI during HMA + venetoclax independently predicts mortality (HR 1.86); sepsis **more frequent**[48]
Cognitive impairment	Mini-Cog at baseline; caregiver engagement **essential** for oral venetoclax adherence	**MMSE dysfunction** predicts grade 3–4 infections and prolonged hospitalization (≥40 days, p=0.005)[41]
Diabetes + steroid-containing regimens (corticosteroid in ALL, dexamethasone)	Glycemic management with endocrinology; adjust insulin/oral agents during treatment	Hyperglycemia can mimic or mask infection; increased insulin needs during induction[17]

COMORBIDITY[14,15,25,36]	APPROACH[14,15,25,36]	CAUTION[14,15,25,36]
Polypharmacy and CYP3A4 inhibitor exposure	Pharmacist consult; venetoclax dose adjustment per interaction tier*	**At least** 50% dose reduction for moderate inhibitors;* 75% for strong inhibitors*

ABBREVIATIONS: AKI = acute kidney injury; ALL = acute lymphoblastic leukemia; CrCl = creatinine clearance; CYP3A4 = cytochrome P450 3A4; FLAG = fludarabine/cytarabine/G-CSF; HMA = hypomethylating agent; HR = hazard ratio; LDAC = low-dose cytarabine; LV = left ventricular; LVEF = left ventricular ejection fraction; MMSE = Mini-Mental State Examination.
*Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions

Cost-Smart Options

BRAND (EST. COST)[49–51]	GENERIC/ ALTERNATIVE (EST. COST)[49,52]	EST. MONTHLY SAVINGS	COST-SMART TIP (MEDICARE COVERAGE)[5,53,54]
Venclexta (venetoclax) 400 mg/day (~$8,000–$10,000 /mo)	Available soon Est. May 2026	N/A	(Part D); manufacturer copay assistance and patient assistance programs available; coordinate social work referral early; **no generic expected near-term**
Vidaza (azacitidine) 75 mg/m^2 SC/IV days 1–7 (~$9,800/ cycle brand)	Generic azacitidine SC/IV (**~$650–$8,600 /cycle** depending on source)	**~$1,200–$9,000/ cycle**	(Part B; infusion); **generic azacitidine widely available**; verify formulary tier; biosimilar use where appropriate
Dacogen (decitabine) 20 mg/ m^2 IV days 1–5 (~$10,800/cycle brand)	Generic decitabine IV (**~$900–$9,800 /cycle**)	**~$1,000–$9,900/ cycle**	(Part B); generic decitabine per formulary; Inqovi (oral decitabine/cedazuridine) is brand-only (~$9,000/cycle) = oral convenience but **no generic savings**
Onureg (oral azacitidine) 300 mg days 1–14 (~$25,400/cycle)	No generic available	N/A	(Part D); maintenance indication only (not interchangeable with injectable azacitidine); significantly higher cost than injectable generic azacitidine
Xospata (gilteritinib) 120 mg/day (~$18,000–$22,000/mo)	No generic available	N/A	(Part D); **FLT3-mutated R/R AML only**: confirm mutation status before initiating; patient assistance program available; total monthly costs lower than intensive chemo ($47,218 vs. $171,982 all-cause)

BRAND (EST. COST)[49–51]	GENERIC/ ALTERNATIVE (EST. COST)[49,52]	EST. MONTHLY SAVINGS	COST-SMART TIP (MEDICARE COVERAGE)[5,53,54]
Tibsovo (ivosidenib) 500 mg/day (~$28,000–$32,000 /mo)	No generic available	N/A	(Part D); **IDH1-mutated AML only**; ICER ~$253,000/QALY vs. azacitidine alone, cost-effectiveness debated; patient assistance program essential for most patients
Blincyto (blinatumomab) (~$89,000–$178,000/cycle depending on indication)	No generic available	N/A	(Part B; infusion); **requires continuous IV infusion pump** = significant nursing/ pharmacy coordination; increasingly used in frontline ALL consolidation; patient assistance available
Besponsa (inotuzumab ozogamicin) 1.8 mg/m^2/cycle (~$42,000–$56,000/ cycle)	No generic available	N/A	(Part B); R/R CD22+ B-ALL; monitor LFTs closely (SOS/VOD risk, especially pre-HCT); limit to ≤6 cycles per label
Generic 6-MP + methotrexate (ALL maintenance) (~$50–$200/mo)	Already generic	N/A	**Lowest-cost phase** of ALL treatment; PCP role: monitor CBC, LFTs; reinforce adherence; thiopurine methyltransferase (TPMT) testing should be on file

ABBREVIATIONS: AML = acute myeloid leukemia; ALL = acute lymphoblastic leukemia; CBC = complete blood count; FLT3 = FMS-like tyrosine kinase 3; HCT = hematopoietic cell transplantation; HMA = hypomethylating agent; ICER = incremental cost-effectiveness ratio; IDH1 = isocitrate dehydrogenase 1; IV = intravenous; LFTs = liver function tests; mo = month; QALY = quality-adjusted life-year; R/R = relapsed/refractory; SC = subcutaneous; SOS/VOD = sinusoidal obstruction syndrome/veno-occlusive disease; TPMT = thiopurine methyltransferase; 6-MP = 6-mercaptopurine

Patient Education and Adherence

AAVBC PERSPECTIVE

*Acute leukemia treatment decisions carry profound implications for quality of life, and they must be made **with patients, not for them**. For older adults, the choice between intensive induction chemotherapy, outpatient HMA + venetoclax, or best supportive care is shaped by functional status (**biological age** rather than chronological age), comorbidities, personal goals, and caregiver support. Shared decision-making conversations should cover **realistic expected outcomes** (**VIALE-A**: median OS 14.7 months with azacitidine + venetoclax vs. 9.6 months with azacitidine alone; historically ~5–6 months with low-dose cytarabine and ~2–3 months with best supportive care in unfit older adults),[45,55] **daily treatment burden**,*

> ***infection risk*** *during neutropenia, and advance care planning. These conversations generate* ***documentable clinical work****: advance care planning (****CPT 99497/99498****;* ***MIPS #047****) with surrogate designation and code status, geriatric assessment findings (****G8****,* ***SPPB****) that inform treatment intensity, caregiver and social support evaluation for outpatient regimen feasibility, and explicit shared decision-making narrative when patients choose or decline intensive therapy. PCPs hold the relational context oncology teams often lack: documenting the patient's expressed values, goals, and support system turns a treatment plan into a* ***patient-led care trajectory****.*

Patients should know the warning signs warranting **urgent evaluation**: fever **≥38.0°C** (call oncology immediately, **do not wait**); new bleeding, bruising, or petechiae (possible worsening thrombocytopenia); **new shortness of breath** or **rapid weight gain** (possible differentiation syndrome or tumor lysis syndrome → same-day contact); and **signs of infection** such as chills, sore throat, or dysuria during neutropenic periods. Venetoclax adherence is foundational: take at the same time daily with a meal, strictly avoid grapefruit juice, and inform all clinicians and pharmacists of the regimen **before** any new prescription is dispensed to prevent CYP3A4 interactions.

Quality Metrics Tie-In

Acute leukemia intersects **multiple quality measurement domains**: oncology-specific end-of-life metrics (NQF #0210, #0213, #0215/0216), geriatric care (COA, advance care planning), care transitions (medication reconciliation, readmissions), and depression screening. The disease's high early mortality, prolonged cytopenias with frequent ED utilization, complex polypharmacy (particularly CYP3A4-mediated venetoclax interactions), and rapid functional decline in older adults mean that nearly every major HEDIS, MIPS, and CMS value-based program measure applies simultaneously across the care trajectory.

MEASURE	STANDARD	NOTES
HEDIS: Care for Older Adults (COA) - Medication Review	**Denominator**: MA enrollees ≥66, continuously enrolled; **Numerator**: 4 sub-measures documented annually: (**1**) functional status assessment, (**2**) medication review, (**3**) pain assessment, (**4**) advance care planning; **Exclusions**: hospice, ESRD	Most directly applicable cross-cutting measure for elderly leukemia patients; SPPB, G8, and **medication reconciliation for venetoclax interactions** satisfy multiple sub-measures simultaneously
HEDIS: Medication Reconciliation Post-Discharge (MRP)	**Denominator**: enrollees ≥18 discharged from inpatient facility; **Numerator**: medication reconciliation completed within 30 days of discharge; **Exclusions**: hospice	Critical for AML patients post-induction hospitalization; CYP3A4 screening for venetoclax, azole antifungal dose adjustments, and polypharmacy review at every transition

MEASURE	STANDARD	NOTES
HEDIS: Plan All-Cause Readmissions (PCR)	**Denominator**: acute inpatient discharges for enrollees ≥18, discharged alive; **Numerator**: unplanned readmission within 30 days; **Exclusions**: planned readmissions, transfers, AMA discharges, cancer medical treatment admissions	AML induction carries high readmission rates for febrile neutropenia, bleeding, and infection; cancer treatment admissions excluded from denominator
MIPS #047: Advance Care Planning	**Denominator**: patients ≥65 with ≥1 qualifying encounter during reporting period; **Numerator**: advance care plan or surrogate decision-maker documented, OR documentation that ACP was discussed but patient declined; **Exclusions**: none specified	Billable as **CPT 99497/99498** during AWV with no patient copay; particularly high-value in acute leukemia given treatment intensity decisions and prognosis discussions
MIPS #134: Depression Screening (PHQ-9)	**Denominator**: patients ≥12 with ≥1 qualifying encounter; **Numerator**: screened for depression using PHQ-9 AND follow-up plan documented if positive; **Exclusions**: active depression diagnosis with current treatment	NCCN recommends distress screening at every visit for all cancer patients;[40] acute leukemia patients face high psychosocial burden from prolonged hospitalization, functional decline, and uncertain prognosis
NQF #0210: Chemotherapy in Last 14 Days of Life	**Denominator**: patients who died of cancer during measurement period; **Numerator**: patients who received systemic therapy (including targeted agents) in last 14 days of life; **Lower is better**	Applies to venetoclax, HMA, and all systemic agents; early palliative care integration and goals-of-care documentation reduce rates
NQF #0213: ICU Admission in Last 30 Days of Life	**Denominator**: patients who died of cancer; **Numerator**: #0215 = not referred to hospice; #0216 = hospice referral ≤3 days before death. **Lower is better**	EOM quality score includes hospice enrollment ≥3 days before death; document hospice eligibility assessment at each visit when prognosis is limited
CMS OP-35: Chemo-Associated ED/Hospitalization (30-day)	**Denominator**: 6-month chemotherapy episodes; **Numerator**: episodes with ≥1 chemotherapy-associated ED visit or hospitalization within 30 days of treatment; **Lower is better**	Document chemo date, ANC nadir, fever management, reason for any ED contact; included in EOM performance scoring

ABBREVIATIONS: HEDIS = Healthcare Effectiveness Data and Information Set; COA = Care for Older Adults; MA = Medicare Advantage; ESRD = end-stage renal disease; SPPB = Short Physical Performance Battery; MRP = Medication Reconciliation Post-Discharge; CYP3A4 = cytochrome P450 3A4; AML = acute myeloid leukemia; PCR = Plan All-Cause Readmissions; AMA = against medical advice; MIPS = Merit-based Incentive Payment System; ACP = advance care planning; CPT = Current Procedural Terminology; AWV = annual wellness visit; NQF = National Quality Forum; HMA = hypomethylating agent; ICU = intensive care unit; EOM = Enhancing Oncology Model; PHQ-9 = Patient Health Questionnaire—9; NCCN = National Comprehensive Cancer Network; CMS = Centers for Medicare & Medicaid Services; ED = emergency department; ANC = absolute neutrophil count

QUALITY OUTCOME

*When primary care maintains accurate leukemia subtype coding, documents geriatric assessment findings that inform treatment intensity decisions, coordinates CYP3A4 drug interaction screening at every visit, and integrates palliative care concurrently rather than at end of life, patients experience **fewer chemotherapy-associated ED visits**, **lower readmission rates** during neutropenic periods, and **improved continuity** across oncology and primary care. Quality outcomes follow naturally from delivering and documenting the care the clinical picture demands: **Stars**, **MIPS**, and **EOM scores** are consequences of good care, not separate goals.*

DOCUMENTATION: GOOD DOCUMENTATION IS COMPREHENSIVE CODING

When a treatment decision is reached between oncology and the patient, the PCP note should confirm:
(1) Specific cell-type code with 6th-character status (e.g., **C92.01** AML in remission vs. **C91.00** ALL not having achieved remission)
(2) Current treatment phase (active induction/consolidation/maintenance/surveillance/best supportive care)
(3) Most recent CBC with date and values,
(4) Functional status with trend (SPPB, G8)
(5) Advance care plan status
This anchors subsequent care in a **transparent clinical record** rather than fragmented specialist notes and ensures MEAT documentation is satisfied **at every encounter**.

5 CODING REMINDERS AND CASE EXAMPLES

Documentation Specificity

- **Stage/Severity:** Specify AML vs. ALL lineage, then ELN 2022 risk category for AML (**favorable**/**intermediate**/**adverse**)[27] or Ph-status for ALL; this sub-classification drives **HCC mapping** and **treatment eligibility**[14,15,36]
- **Etiology:** Document prior MDS/MPN, prior cytotoxic therapy, occupational benzene/petrochemical exposure, or genetic syndromes (Down, Fanconi): secondary vs. de novo status affects **prognosis** and **regimen choice**
- **Current status:** Most recent CBC with date (ANC, Hgb, platelets), current cycle/phase of treatment, and functional measure (SPPB or ECOG); update every encounter during the reporting year

- **Associated conditions:** Febrile neutropenia (**D70.1** + **R50.81**), DIC (**D65**), TLS (**E88.3**), chemotherapy-induced anemia (**D64.81**); each carries independent clinical and coding significance
- **Chronicity:** Diagnosis date, cycle number, duration in remission; distinguishes active surveillance (**C91.01**/**C92.01**) from Z85.6 (applies **ONLY** when all active therapy is complete)

Annual Clinical Review and Confirmation

- **Annual review:** AML and ALL must be reassessed face-to-face or via synchronous audio-video telehealth **each reporting year** = update cell type, ELN risk category, and 6th-character remission status
- **Visit modality:** In-person or video telehealth with meaningful evaluation qualifies; document functional assessment and laboratory review.
- **Clinical context:** Under HCC V28, accurate cell-type and staging mapping matters: **HCC 17** (AML) at RAF ~4.209 differs meaningfully from **HCC 18** (ALL/unspecified) at 2.341; the goal is accurate clinical complexity representation, not code optimization
- **Avoid rollover: Do not** copy last year's AML note forward without updating CBC with date, current cycle/phase, functional status, and patient-reported goals of care

Good Documentation is Comprehensive Coding

EHR SHORTCUT/RISK	PREFERRED DOCUMENTATION LANGUAGE[14,15]
'Leukemia' on problem list	'AML (C92.01), ELN 2022 intermediate risk, in complete remission on maintenance azacitidine + venetoclax, last oncology visit [date]'
'History of leukemia' in an actively monitored patient	'AML in remission (C92.01) — on active maintenance therapy; annual MEAT required. Do not use Z85.6 until all active therapy has ended.'
Copy-forward 'AML' from last year without re-confirmation	'AML (C92.01), reconfirmed today: CBC from [date] (ANC, Hgb, platelets), current regimen [name], patient goals unchanged. Annual clinical review complete.'
'Chemo-induced anemia'	'Anemia due to antineoplastic chemotherapy (D64.81) from maintenance azacitidine + venetoclax for AML (C92.01): transfusion-dependent, last transfusion [date].'
'Febrile neutropenia'	'Febrile neutropenia — T 38.6°C, ANC 320/µL, on maintenance venetoclax for AML (C92.01); blood cultures drawn; empiric cefepime initiated.'; codes: **D70.1** + **R50.81** + **C92.01**

EHR SHORTCUT/RISK	PREFERRED DOCUMENTATION LANGUAGE[14,15]
'Unspecified acute leukemia' after pathology has returned	'Acute myeloid leukemia, ELN [risk], active, not in remission (C92.00)'; update once pathology is confirmed; **C95.0x should not persist** once lineage is known

ABBREVIATIONS: AML = acute myeloid leukemia; ANC = absolute neutrophil count; CBC = complete blood count; CMP = comprehensive metabolic panel; ELN = European LeukemiaNet; MEAT = monitor/evaluate/assess/treat; SPPB = Short Physical Performance Battery

EHR Workflow Tips

[EHR TIP — Smartphrase] Build a **.alvisit dot phrase** that auto-populates ICD-10 with 6th character status, cell type and ELN risk category, most recent CBC with differential (with date), current regimen/cycle/day, SPPB score with trend, advance care plan status, and a medication reconciliation flag that screens for CYP3A4 interactions — sourced from oncology notes, lab results, and pharmacy records. Reduces unspecified leukemia coding and supports MEAT documentation in a single paste.

[EHR TIP — Alert] Worklist filter "**Acute Leukemia Active**" = surfaces patients with C91.xx, C92.xx, or C95.0x (6th character = 0 or 1) or any patient with a Z51.11 antineoplastic chemotherapy encounter in the last 12 months plus leukemia on the problem list. Identifies active patients due for PCP-level follow-up or lab review.

[EHR TIP — Best Practice] Problem list hygiene: maintain the problem list entry as specific (e.g., "AML, ELN 2022 intermediate risk, in complete remission"), **not** "leukemia." Update the 6th character **at every reassessment**; never leave as "unspecified" after pathology confirmation. Code each active comorbidity **individually** (pancytopenia D61.810, cardiotoxicity monitoring I25.x, secondary infection history).

[EHR TIP — Workflow] Annual diagnosis confirmation: fire a BPA when an active leukemia code (C91.xx, C92.xx, C94.xx, C95.0x) appears on the problem list and no face-to-face or synchronous audio-video encounter with MEAT documentation has been recorded in the past 12 months. Fires at year-end to support HCC mapping and RAF continuity before the sweep deadline.

[EHR TIP — Order Set] "**Acute Leukemia Surveillance Labs**" order set: CBC with differential, CMP, LDH, uric acid, peripheral smear review; frequency adjustable per treatment phase (induction/consolidation/maintenance/surveillance). New-diagnosis add-on bundle includes hematology/oncology referral, palliative care consult, and genetic counseling referral = all triggered at problem list entry.

[EHR TIP — Auto-prompt] Triggered **referral cascade** at new acute leukemia diagnosis: hematology/oncology, cardio-oncology (anthracycline-eligible patients), palliative care (concurrent, not end-of-life only), and genetic counseling. **During active treatment**: G-8 ≤14 fires a geriatric oncology referral prompt; SPPB <9 fires a physical therapy referral prompt. One-click referral template auto-populates reason for referral and most recent labs.

Brief Case Examples

SUCCESS: COMPREHENSIVE DOCUMENTATION

SCENARIO

A 72-year-old female patient with AML diagnosed 9 months ago, ELN 2022 **intermediate risk**, on maintenance azacitidine + venetoclax after lower-intensity induction. Presents to PCP for routine follow-up; reports fatigue but no fever, no new bleeding. PCP reviewed most recent oncology CBC, performed functional assessment, and documented the full clinical picture in a single encounter:

Documentation: "Acute myeloid leukemia (**C92.01**), ELN 2022 intermediate risk, in complete remission on maintenance azacitidine 75 mg/m^2 days 1–7 + venetoclax 400 mg daily (cycle 10), last oncology visit [date] with Dr. [Name]. Reviewed CBC from [date]: ANC 1,200/µL, Hgb 10.2 g/dL, platelets 92,000/µL. SPPB today = 7 (declined from 9 three months ago). No fever, no new bleeding. Advance care plan on file, patient confirms unchanged goals. Assessment: AML in remission = continue current oncology regimen; physical therapy referred for functional decline. Chemotherapy-induced pancytopenia (**D61.810**). Return 6 weeks or sooner if fever ≥38.0°C or new bleeding."

Outcome: HCC 17 (active malignancy) confirmed with specific cell type and remission status; chemotherapy-induced pancytopenia documented as a distinct coded comorbidity; functional decline captured with SPPB trend supporting geriatric reassessment; advance care plan documented per **MIPS #047**. Every MEAT element present: regimen with dose and cycle number, CBC with date and values, functional measure with trend, coded diagnoses, treatment plan with follow-up interval and symptom-based return criteria.

PITFALL: INSUFFICIENT DOCUMENTATION

Documentation as written: "Hx of leukemia, stable. CBC ok. Continue current meds. F/u 3 months." **Coded as Z85.6** (personal history of leukemia). The chart does not specify cell type (AML vs. ALL), remission status, regimen name, CBC values or date, functional status, or advance care plan.

Consequence: "Hx of" on an active-maintenance patient triggers Z85.6 = **eliminates HCC mapping entirely**. No 6th-character remission status, no regimen documentation, and "CBC ok" without values or date **fails** MEAT on every element. The record understates the clinical complexity the team is actually managing and impairs continuity between PCP and oncology.

RAF Impact: Z85.6 carries zero HCC value. With proper documentation (**C91.01** or **C92.01** with remission status + coded comorbidities), the record reflects the substantive ongoing work the care team is doing.

Fix: Update problem list and assessment: "ALL (**C91.01**) in complete molecular remission; 3.5 years post-initial induction, on maintenance 6-MP + methotrexate per hematology (Dr. [Name], last seen [date]). Reviewed CBC from [date]: WBC 4.2, Hgb 12.8, platelets 165,000. SPPB 10, gait steady. No B symptoms, no bleeding. Advance care plan reviewed, no changes. Continue the current regimen. Return 3 months; sooner for fever ≥38.0°C, new bleeding, or unexplained fatigue." Coding after fix: **C91.01** (ALL in remission → **HCC 18**) + **Z79.899** (long-term drug therapy) = real clinical picture preserved.

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