Advances in Personalized TKI Therapy for CP-CML

Oncology Nursing Pocket Guide

DECERA CLINICAL Education

Overview

This oncology guide was designed to assist nurses in the education of tyrosine kinase inhibitors (TKIs), monitoring of adverse events (AEs), and the practice of supportive care for patients with chronic phase (CP) CML.



Nursing Scope Reminder: The oncologist or advanced practice provider directs TKI selection, response assessment, treatment interruption, dose modification, re-escalation, switching, and treatment-free remission decisions. Oncology nurses reinforce the prescribed plan, assess adherence and AEs, provide education within institutional protocols, document concerns, and escalate issues to the multidisciplinary team (MDT).

TKI CARE: A Nursing Memory Tool

	Memory Cue	Nursing Action
T	**Treatment plan is oncologist directed**	Reinforce the oncology team's plan, treatment goals, and patient questions for the prescriber
K	**Know how to take the drug**	Review dose timing, food requirements, missed dose instructions, storage, refill timing, and interaction risks
I	**Identify adherence barriers**	Ask about missed doses, side effects, cost, access, fasting requirements, literacy/language needs, distress, cognition, support, transportation, and routine
C	**Check response and labs**	Reinforce monitoring with complete blood count (CBC), comprehensive metabolic panel (CMP)/chemistry labs, additional TKI-specific labs, and BCR::ABL1 PCR as ordered
A	**Assess and grade AEs**	Use CTCAE concepts and institutional protocols; document onset, severity, duration, ADL impact, missed doses, and self-management
R	**Report red flags to the MDT**	Escalate urgent symptoms, treatment interruptions, severe AEs, major interactions, pregnancy/fertility questions, or access problems
E	**Educate using teach-back**	Use plain language: "Just so I know I explained it clearly, how will you take this medication tomorrow?"

Prescriber-Led TKI Selection: What Nurses Can Reinforce

- Disease factors: CP-CML risk category, response milestones, BCR::ABL1 transcript type, mutation profile if tested, and treatment history
- Patient goals: long-term disease control, deeper molecular response, potential future treatment-free remission, pregnancy/fertility planning, convenience, tolerability, and quality of life
- Safety factors: cardiovascular risk, hypertension, diabetes, pulmonary disease, hepatic/renal dysfunction, pancreatitis history, QT risk, bleeding risk, and baseline cytopenias
- Practical factors: dosing schedule, food requirements, drug interactions, pill burden, cost, insurance coverage, specialty pharmacy delays, generic availability, and ease of administration
- Nursing action: document patient priorities and barriers; encourage patients to discuss goals and concerns with the oncology team before any treatment change

TKI Dosing, Administration, and Nursing Watch Points

Approved TKIs in CP-CML: Practical Breakdown for Nursing Education
Adult CP-CML dosing show below. *Verify indication, dosing, administration, and dose modifications against current prescribing information and institutional policy. The oncologist/APP directs TKI selection.*

TKI	Practical Role in CP-CML	Class/ Generation	Common Adult CP-CML Dosing	High-Yield Nursing Watch Points
Imatinib	**Newly diagnosed option** and long-standing standard therapy	First-generation ATP-competitive BCR::ABL1 TKI	Commonly 400 mg once daily	Edema/fluid retention, nausea/diarrhea, muscle cramps/myalgias, rash, fatigue, hypophosphatemia, renal dysfunction, hepatic labs, myelosuppression
Dasatinib	**Newly diagnosed option**; also used in selected later-line settings	Second-generation ATP-competitive BCR::ABL1 TKI	100 mg once daily	Pleural/pericardial effusion, dyspnea/cough, pulmonary arterial hypertension, bleeding risk, myelosuppression, arterial occlusive events, acid-reducing therapy, CYP3A interactions
Nilotinib	**Newly diagnosed option**; also used in selected later-line settings	Second-generation ATP-competitive BCR::ABL1 TKI	Newly diagnosed: 300 mg twice daily Resistant/intolerant: 400 mg twice daily	◢ Boxed warnings: QT prolongation, sudden deaths, and avoid strong CYP3A4 inhibitors ◢ Assess metabolic syndrome, hyperglycemia/lipid changes, pancreatic enzyme elevation, hepatotoxicity, arterial occlusive events, and DDIs
Bosutinib	**Newly diagnosed option**; also used in resistant/ intolerant CP-CML	Second-generation ATP-competitive BCR::ABL1 TKI	Newly diagnosed: 400 mg once daily Resistant/intolerant: 500 mg once daily	Diarrhea, nausea/vomiting, transaminase elevation, rash, myelosuppression, fluid retention, arterial occlusive events, CYP3A interactions, acid-reducing therapy
Asciminib	**Newly diagnosed option** and option for **previously treated Ph+ CP-CML**; also has **T315I dosing**	STAMP/allosteric BCR::ABL1 inhibitor; not usually classified as 1st/2nd/3rd generation	80 mg once daily or 40 mg twice daily *T315I* mutation: 200 mg twice daily	Hypertension, pancreatic enzyme elevation/pancreatitis, nausea, myelosuppression, hypersensitivity, arterial occlusive events, adherence, DDIs
Ponatinib	Not indicated or recommended for newly diagnosed CP-CML; used for **resistant or intolerant disease** or *T315I*-positive CML	Third-generation ATP-competitive/ pan-BCR::ABL1 TKI	45 mg once daily with reduction to 15 mg once daily after BCR::ABL1IS ≤1%	◢ Boxed warnings: arterial occlusive events, venous thromboembolism, heart failure, and hepatotoxicity ◢ Assess hypertension, ischemic symptoms, pancreatic enzyme elevation/pancreatitis, myelosuppression, and DDIs
Across TKIs: Monitor for class-wide or overlapping toxicities, including myelosuppression, fatigue, myalgias/ arthralgias, headache, rash, GI symptoms, chronic low-grade adherence-limiting symptoms, and patient-reported cognitive effects such as “brain fog.”				

DDI, drug–drug interaction; IS, International Scale for levels of fusion gene transcript in blood or marrow.

Meal Considerations: How to Take Each TKI

Food requirements are TKI specific and can affect exposure, tolerability, and adherence. Nurses should reinforce the prescribed instructions and use teach-back.

Meal Rule	TKIs	Teaching Point
Take with food *and a large glass of water	Bosutinib, imatinib*	Helps with absorption/tolerability depending on agent; reinforce taking exactly as prescribed.
Take on an empty stomach	Asciminib, nilotinib*	Avoid food for at least 2 hours before and 1 hour after. Reinforce consistent timing. Boxed warning.
Take with or without food	Dasatinib, ponatinib	Consistent routine still supports adherence.

Patient interaction tip: Ask: "When will you take your TKI tomorrow, and what will you eat or avoid around that dose?" Escalate if fasting requirements, nausea, food insecurity, work schedule, or meal timing interfere with adherence.

DDI Quick Screen: Ask, Flag, Escalate

Not all DDIs apply equally to all TKIs. Interaction risk depends on the specific TKI, dose, comorbidities, organ function, and concomitant medications. At each visit, ask about new prescriptions, OTC medications, acid reducers, supplements/herbals, antibiotics, antifungals, antivirals, cardiac medications, anticoagulants, and antiplatelets. Escalate potential interactions to the oncology team or pharmacist before the patient starts, stops, or changes a medication.

- CYP3A inhibitors/inducers: important for several TKIs; see Appendix A for examples
- Acid-reducing therapy: especially important with dasatinib and bosutinib
- QT-prolonging drugs or electrolyte loss: highest priority with nilotinib
- Bleeding-risk medications: especially important with thrombocytopenia or dasatinib
- Supplements/herbals: ask directly; St John's wort is a key concern

Monitoring and Response: What Nurses Reinforce

- CBC with differential is monitored frequently when starting or switching therapy until blood counts are stable
- CMP and other chemistry labs are monitored as ordered to assess hepatic function, renal function, electrolytes, glucose, and treatment-related abnormalities
- Additional labs may be ordered based on the prescribed TKI and patient risk factors, such as lipase/amylase, fasting glucose/lipids, magnesium/potassium, or phosphorus
- BCR::ABL1 quantitative PCR on the International Scale is generally assessed at least every 3 months until major molecular response is achieved and confirmed
- Major molecular response corresponds to BCR::ABL1 ≤0.1%
- Deep molecular response may support future treatment-free remission discussions in selected patients, but discontinuation should only occur under oncology team supervision
- Trends matter; missed doses, refill gaps, treatment holds, drug interactions, and toxicity-related interruptions should be assessed before assuming resistance

Plain Language Milestone Framework on TKI Therapy

- 3 months: BCR::ABL1 ≤10% is generally favorable; >10% requires reassessment and confirmation
- 6 months: BCR::ABL1 ≤1% is generally favorable; >1% to 10% is a warning range; >10% is unfavorable
- 12 months: BCR::ABL1 ≤0.1% is favorable; >0.1% to 1% is a warning range; >1% is generally unfavorable
- Any time: loss of response, rising BCR::ABL1 without explanation, resistant mutations, or high-risk cytogenetic changes should prompt timely oncology team review

Molecular Monitoring and Escalation Pearls

- Most patients have typical BCR::ABL1 transcripts that can be monitored by quantitative PCR on the International Scale
- If the patient has an atypical transcript or unexpected monitoring issue, reinforce follow-up with the oncology team; alternative monitoring approaches may be needed
- Some uncommon transcripts may affect monitoring or TKI suitability; nurses should not interpret transcript implications independently but should escalate questions to the oncology team
- Escalate promptly for missed milestones, loss of response, unexplained BCR::ABL1 rise, possible resistance, or progression concerns
- A confirmed >10-fold rise in BCR::ABL1, especially when BCR::ABL1 remains >0.1%, should prompt oncology team review and possible mutation testing

Adherence and Persistence: Ask Early, Ask Often

Use nonjudgmental questions:

- "Many people miss doses. How many doses have you missed in the past week or month?"
- "What makes it hard to take this medication exactly as prescribed?"
- "Do side effects, cost, travel, fasting requirements, or refill timing ever cause you to skip or delay a dose?"
- "Can you walk me through how you take your TKI each day?"

Nursing interventions:

- Provide verbal and written education before the first dose and after any change
- Use the teach-back technique
- Assess access, copay, specialty pharmacy coordination, pill supply, refill timing, and generic/formulation questions
- Screen for language, literacy, distress, transportation, food insecurity, depression, cognitive barriers, and caregiver support needs
- Escalate missed doses, access barriers, patient-directed interruptions, or adherence-limiting symptoms to the MDT promptly

Dose Modification and CTCAE Triage: Nursing Scope

Dose interruption, reduction, re-escalation, switching, or discontinuation should be directed by the oncologist/APP using current prescribing information, response data, toxicity severity, recurrence, comorbidities, and patient goals.

- Nurses support dose optimization by identifying adherence-limiting AEs, documenting CTCAE grade when applicable, assessing missed doses and self-held therapy, recording onset/severity/duration/functional impact, and escalating persistent grade 2, any grade ≥3, serious, recurrent, or treatment-interrupting toxicity
- CTCAE-style triage: Grade 1 = mild; Grade 2 = moderate; Grade 3 = severe/medically significant; Grade 4 = life-threatening; Grade 5 = death related to AE

AE Timeline Quick Scan: Onset, Resolution, and Follow-up Priorities

AE timing varies by TKI, dose, prior therapy, comorbidities, baseline organ function, concomitant medications, and supportive care. The examples below highlight common timing patterns nurses can use for anticipatory guidance and follow-up planning. Escalate persistent grade 2, any grade ≥3, serious, recurrent, or adherence-limiting toxicity.

AE/TKI Signal	Typical Onset Pattern	Resolution/Follow-up	Nursing Action Point
Bosutinib-associated diarrhea	Often early; median onset reported within the first few days of therapy (about 2-4 days depending on setting)	Median duration per event is often short (about 2-3 days), but persistent or recurrent diarrhea can affect adherence	"Diarrhea can start within the first week. Call early rather than skipping doses."
Nausea/vomiting and GI intolerance	Often early after TKI initiation or dose change, especially when administration instructions are difficult to follow	May improve with correct food/fasting administration, antiemetics, hydration, and supportive care; persistent symptoms need prescriber review	Confirm how the patient takes the TKI, meal timing, missed doses, and ability to maintain fluids.
Dasatinib pleural/pericardial effusion or dyspnea	Often delayed rather than immediate; reports describe onset from weeks to months, with late-onset events possible during long-term therapy	May require diagnostic evaluation, treatment hold, supportive care, dose reduction, or switch if recurrent/severe	Report new cough, shortness of breath, chest discomfort, or reduced exercise tolerance even after long-term therapy.
Nilotinib QT prolongation/arrhythmia risk	Clinically relevant early and after dose or medication changes; ECG monitoring is recommended at baseline, 7 days after initiation, periodically, and after dose adjustment	Risk may improve after correcting electrolytes, removing interacting drugs, and prescriber-directed hold/dose adjustment; recurrent QTc prolongation may require discontinuation	Ask about syncope, palpitations, dizziness, vomiting/diarrhea, new QT-prolonging medications, and missed lab/ECG checks.
Myelosuppression	Can occur early after starting or switching TKIs but may also occur later or recur after rechallenging	Recovery depends on severity, TKI, marrow reserve, disease status, and prescriber-directed interruption/reduction	Reinforce scheduled CBC monitoring and urgent reporting of fever, infection symptoms, bleeding, bruising, or severe fatigue.
Hepatotoxicity/transaminase elevation	Can occur early or later; risk varies by TKI and patient factors	May resolve with prescriber-directed hold, reduction, or discontinuation depending on severity and recurrence	Reinforce CMP/liver lab monitoring and reporting of jaundice, dark urine, right upper quadrant pain, or persistent nausea/vomiting.
Pancreatic enzyme elevation/pancreatitis	Can occur during therapy with TKIs associated with pancreatic toxicity, including asciminib, nilotinib, and ponatinib	Lipase/amylase monitoring and symptom assessment guide prescriber-directed hold, reduction, or discontinuation	Report severe abdominal pain, persistent nausea/vomiting, or symptoms concerning for pancreatitis immediately.
Asciminib-associated hypertension	May occur later; grade 3-4 hypertension has been reported with median first occurrence around 45 weeks	Requires ongoing BP monitoring and standard antihypertensive management; severe/persistent hypertension may require prescriber-directed TKI action	Reinforce BP checks as ordered and urgent reporting of severe headache, vision changes, chest pain, neurologic symptoms, or very high BP readings.
Cardiovascular/vascular events	Variable timing; risk can be influenced by baseline risk factors, TKI exposure, dose, and prior therapy	Serious vascular events require urgent evaluation and may require interruption or discontinuation	Urgently report chest pain, stroke-like symptoms, severe headache/vision changes, acute limb pain/coolness, dyspnea, or syncope.
Chronic low-grade symptoms	Fatigue, rash, myalgias/arthralgias, headache, and brain fog may emerge early or gradually and persist over time	Symptom tracking, supportive care, evaluation for reversible causes, and prescriber review can help prevent self-holding	Ask at every visit: "Which side effect is most likely to make you miss a dose?"
TKI withdrawal syndrome after discontinuation	**Class-wide key point:** reported after stopping multiple TKIs, with strongest data for imatinib, dasatinib, nilotinib, and bosutinib; limited emerging data after asciminib	◢ New or worsening musculoskeletal pain, arthralgias, myalgias, or bone/joint pain may occur within weeks to 3 months after stopping ◢ Symptoms often improve over time and may return toward baseline by about 6 months ◢ Tapering/de-escalation does not clearly prevent withdrawal syndrome, but some oncology teams may use planned de-escalation before discontinuation in selected patients	Teach patients not to stop or restart TKIs independently. Escalate new/worsening pain after discontinuation, adherence concerns, or any patient-directed treatment hold. Confirm BCR::ABL1 monitoring plan if pursuing treatment-free remission.

TKI discontinuation/de-escalation key point: Some patients who achieve a sustained deep molecular response may be eligible for a prescriber-directed treatment-free remission attempt. Some oncology teams may use a planned dose de-escalation period before complete discontinuation, whereas others may stop therapy according to established treatment-free remission criteria and close monitoring protocols. Patients should never stop, restart, taper, or change TKI dosing on their own. Unsupervised stopping can risk loss of molecular response and may be associated with withdrawal symptoms, most commonly new or worsening muscle, joint, or bone pain. Close BCR::ABL1 PCR monitoring is required during any TKI discontinuation attempt.

Managing Key AEs: Assess, Grade, Escalate

Use the AE Timeline Quick Scan for onset/resolution patterns, and use the table below for symptom assessment and escalation triggers. Nurses assess, document, provide supportive education within protocol, and escalate concerns. Dose interruption, reduction, re-escalation, or discontinuation should be directed by the oncology team.

AE Cluster	TKIs to Flag	What Nurses Should Assess	Escalation/Dose-Action Trigger
Diarrhea/GI upset	Bosutinib most notable; can occur with other TKIs	Stool frequency over baseline, duration, hydration, dizziness, fever, blood, weight loss, abdominal pain, infection risk, missed doses, antidiarrheal use	Escalate persistent grade 2, any grade ≥3, dehydration, fever, blood, severe abdominal pain, or missed doses. Grade 3-4 or recurrent/persistent diarrhea may require prescriber-directed interruption, reduction, or discontinuation.
Nausea/vomiting	Imatinib, bosutinib, asciminib, others	Episodes per 24 hours, oral intake, weight change, dehydration, timing with dose, food requirements, adherence impact	Escalate persistent grade 2, any grade ≥3, dehydration, inability to maintain intake, or missed doses.
Myelosuppression	All TKIs	CBC trends, ANC/platelets/hemoglobin, fever, infection symptoms, bruising, bleeding, severe fatigue, dyspnea	Escalate severe neutropenia, thrombocytopenia, fever, bleeding, or symptomatic anemia. Severe/recurrent cytopenias may require prescriber-directed hold, reduction, supportive care, or therapy change.
Edema/fluid retention	Imatinib; also dasatinib, bosutinib, ponatinib	Weight gain, periorbital/lower-extremity edema, dyspnea, cough, chest discomfort, reduced activity tolerance	Escalate rapid weight gain, dyspnea, functional decline, or suspected pleural/pericardial effusion.
Pleural/pericardial effusion or dyspnea	Dasatinib most notable	New/worsening cough, shortness of breath, chest pain, decreased exercise tolerance, oxygen saturation if available, fever/infection symptoms	Promptly escalate new or worsening dyspnea. Dasatinib-related effusion may require diagnostic testing, treatment hold, supportive care, dose reduction, or switch if recurrent/severe. Stop dasatinib if pulmonary arterial hypertension is confirmed.
Cardiovascular/vascular toxicity	Ponatinib and nilotinib most notable; assess risk with all TKIs	BP, chest pain, palpitations, syncope, neurologic changes, severe headache, vision changes, limb pain/coolness, dyspnea, cardiovascular risk factors	Urgent escalation for chest pain, stroke-like symptoms, syncope, acute limb symptoms, severe hypertension, or heart failure symptoms. Serious vascular events may require prescriber-directed interruption or discontinuation.
QT prolongation/arrhythmia risk	Nilotinib boxed warning; dasatinib caution; risk increased by QT drugs/electrolyte abnormalities	Palpitations, syncope, dizziness, ECG monitoring as ordered, potassium/magnesium, QT-risk medications, vomiting/diarrhea causing electrolyte loss	Urgent escalation for syncope, palpitations, or concerning ECG/electrolyte findings. Nilotinib QTc >480 msec requires prescriber-directed action per label.
Hepatotoxicity	Bosutinib, nilotinib, ponatinib; can occur with others	AST/ALT/bilirubin trends, jaundice, dark urine, right upper quadrant pain, persistent nausea/vomiting, alcohol/supplement use	Escalate significant lab abnormalities or symptoms of liver injury. Grade ≥3 or recurrent hepatotoxicity may require prescriber-directed interruption, reduction, rechallenge decision, or discontinuation.
Pancreatitis/elevated lipase	Asciminib, nilotinib, ponatinib; can occur with bosutinib	Severe abdominal pain, nausea/vomiting, lipase/amylase trends, prior pancreatitis, alcohol use when relevant, missed doses	Escalate severe abdominal pain, persistent vomiting, or significant enzyme elevation. Symptomatic pancreatitis or recurrent significant lipase elevation may require prescriber-directed interruption, reduction, or discontinuation/switch.
Rash/severe skin reaction	All TKIs	Rash appearance, body surface area, pruritus, pain, mucosal involvement, fever, blistering, skin peeling, facial swelling	Mild rash may be managed per protocol. Urgent escalation for mucosal involvement, blistering, fever, skin pain, facial swelling, or rapidly progressive rash.
Fatigue, brain fog, myalgia/arthralgia, muscle cramps, headache	All TKIs; imatinib commonly associated with cramps/myalgias; vascular risk especially relevant with ponatinib/nilotinib headaches	Onset, severity, ADL impact, sleep, mood, anemia, hydration, electrolytes if ordered, neurologic deficits, vision changes, BP, missed doses	Escalate persistent grade 2, any grade ≥3, functional limitation, neurologic symptoms, severe/sudden headache, or adherence-limiting symptoms.

When to Contact the MDT

- Urgently contact the oncology team for fever, bleeding, severe cytopenias, dyspnea, chest pain, syncope, palpitations, neurologic symptoms, severe headache or vision changes, acute limb pain/coolness, jaundice, severe abdominal pain, dehydration, persistent vomiting/diarrhea, mucosal rash/blistering, suspected pregnancy, pregnancy planning, breastfeeding, fertility preservation questions, major drug interaction, inability to obtain medication, or any patient-directed treatment interruption.

Patient safety language for nurses: "Please do not stop or change your TKI dose on your own. Call the oncology team first. Many side effects can be managed, and the team needs to know early so they can keep your treatment as safe and effective as possible."

Patient and Caregiver Education Tips

- Use plain language: "This medicine works best when taken consistently."
- Normalize adherence barriers: "Many people miss doses or have trouble with refills. We ask everyone."
- Use teach-back after every new start, dose change, or major AE.
- Provide written food rules and missed-dose instructions.
- Encourage patients to call before stopping therapy.
- Ask about cost, transportation, work schedule, caregiver support, food access, and digital access.
- Use interpreters and culturally responsive education to support equitable communication.

Nursing Takeaway

- Personalized CP-CML care requires alignment among oncologist-directed treatment goals, molecular response, tolerability, adherence, comorbidities, *BCR::ABL1* transcript type, cost/access, and patient preferences. Oncology nurses improve outcomes by reinforcing the treatment plan, identifying barriers early, normalizing honest symptom reporting, coordinating access support, and escalating concerns before they lead to avoidable treatment interruption.

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Appendix A. DDI and Food–Drug Interaction Detail

Examples are common and not exhaustive. Use current prescribing information, institutional policy, and pharmacist review for final recommendations.

Interaction Category	TKIs Most Relevant	Common Examples	Nursing Action
CYP3A inhibitors may increase TKI exposure/toxicity	Several TKIs; especially bosutinib, dasatinib, nilotinib, ponatinib; also consider asciminib	Ketoconazole, itraconazole, voriconazole, posaconazole, clarithromycin, erythromycin, ritonavir, cobicistat, diltiazem, verapamil, grapefruit products	Ask about new antibiotics, antifungals, antivirals, cardiac medications, and grapefruit. Escalate before use.
CYP3A inducers may decrease TKI exposure/ effectiveness	Several TKIs; especially bosutinib, dasatinib, nilotinib, ponatinib; also consider asciminib	Rifampin, rifabutin, carbamazepine, phenytoin, phenobarbital, enzalutamide, St John's wort	Ask about seizure medications, TB medications, cancer therapies, and herbal mood products. Escalate promptly because reduced exposure may affect response.
Acid-reducing therapy may reduce absorption	Dasatinib and bosutinib are the main TKIs to flag	PPIs: omeprazole, esomeprazole, pantoprazole, lansoprazole; H_2 blockers: famotidine; antacids: calcium carbonate, aluminum/ magnesium hydroxide	Ask about heartburn medications and OTC antacids. Escalate to pharmacist/ oncology team for timing alternatives or regimen adjustment.
QT-prolonging medications or electrolyte loss may increase arrhythmia risk	Highest priority with nilotinib; consider patient-specific QT risk with other TKIs	Amiodarone, sotalol, dofetilide, quinidine, levofloxacin, moxifloxacin, azithromycin, clarithromycin, fluconazole, voriconazole, ondansetron, haloperidol, ziprasidone, quetiapine, citalopram, escitalopram; also vomiting/diarrhea, diuretics, laxative overuse	Ask about syncope, palpitations, cardiac history, vomiting/diarrhea, and QT-risk drugs. Escalate for medication review and ECG/ electrolyte monitoring as ordered.
Anticoagulants/ antiplatelets/NSAIDs may increase bleeding concern	All TKIs if thrombocytopenic; especially flag dasatinib because of bleeding risk	Warfarin, apixaban, rivaroxaban, dabigatran, enoxaparin, aspirin, clopidogrel, ibuprofen, naproxen	Ask about bruising, bleeding, falls, procedures, aspirin, NSAIDs, and blood thinners. Escalate bleeding symptoms or planned procedures.
Supplements/herbals may affect CYP enzymes, bleeding risk, liver toxicity, or additive AEs	All TKIs; St. John's wort is a key CYP3A inducer concern	St John's wort, turmeric/curcumin, green tea extract, ginkgo, garlic supplements, ginseng, kava, high-dose fish oil, high-dose vitamin E	Ask directly: "What vitamins, teas, powders, herbs, or supplements do you take?" Encourage patients to contact the oncology team before starting supplements.
Food requirements affect exposure or tolerability	TKI-specific	Bosutinib and imatinib: take with food Asciminib and nilotinib: take on an empty stomach Dasatinib and ponatinib: with or without food Grapefruit products may increase exposure to CYP3A-metabolized TKIs	Give written food rules and use teach-back: "When will you take this medication tomorrow, and what will you eat or avoid around it?"

Appendix B. Prescriber-Directed Dose Action

Snapshot

For nurse recognition, documentation, and escalation only. This is not a prescribing algorithm. Dose interruption, reduction, re-escalation, or discontinuation should be directed by the oncologist/APP using current prescribing information, institutional policy, response status, toxicity severity, recurrence, comorbidities, and patient goals.

TKI	Common Examples	Nursing Action
Asciminib	Cytopenias: ANC <1 x 10^9/L and/or platelets <50 x 10^9/L Asymptomatic amylase/lipase elevation >2 x ULN Nonhematologic AEs: grade ≥3	Hold until recovery to label-specified threshold. If cytopenias recover within 2 weeks, therapy may resume at starting dose; if recovery takes >2 weeks or recurs, therapy may resume at reduced dose. First reduction for newly diagnosed/previously treated CP-CML: 40 mg once daily or 20 mg twice daily. For T315I mutation: 160 mg twice daily. Permanently discontinue if unable to tolerate reduced dose or if selected AEs do not resolve or recur at reduced dose.
Bosutinib	Diarrhea: CTCAE grade 3-4 Hepatic: ALT/AST >5x ULN; ALT/AST ≥3x ULN with bilirubin >2 x ULN and alkaline phosphatase <2 x ULN Myelosuppression: ANC <1.0 x 10^9/L or platelets <50 x 10^9/L Other clinically significant moderate/severe nonhematologic toxicities	Grade 3-4 diarrhea: hold until recovery to ≤ grade 1; may resume at 400 mg once daily. ALT/AST >5 x ULN: hold until ≤2.5x ULN, then resume at 400 mg once daily; discontinue if recovery takes >4 weeks or if Hy's law pattern occurs. Myelosuppression: hold until ANC ≥1.0 x 10^9/L and platelets ≥50 x 10^9/L; resume same dose if recovery occurs within 2 weeks; reduce by 100 mg if recovery takes >2 weeks or if cytopenia recurs.
Dasatinib	CP-CML cytopenias: ANC <0.5 x 10^9/L or platelets <50 x 10^9/L Severe nonhematologic AEs, including significant fluid retention/pleural effusion Symptoms suggesting pulmonary arterial hypertension or pleural effusion: new/worsening dyspnea, dry cough, pleuritic chest pain, reduced exercise tolerance	CP-CML cytopenias: stop until ANC ≥1.0 x 10^9/L and platelets ≥50 x 10^9/L. Resume original dose if recovery occurs within 7 days. For recurrent/prolonged cytopenia, reductions may follow 100 mg to >80 mg to >50 mg once daily in newly diagnosed CP-CML; discontinuation may be considered in resistant/intolerant disease after recurrent events. Significant fluid retention/pleural effusion may require hold, supportive care, dose reduction, or discontinuation/switch if recurrent or severe. Stop dasatinib if pulmonary arterial hypertension is confirmed.
Imatinib	Hepatic: bilirubin >3x institutional ULN or transaminases >5x institutional ULN CP-CML cytopenias: ANC <1 x 10^9/L and/or platelets <50 x 10^9/L Severe nonhematologic AEs, such as severe hepatotoxicity or severe fluid retention.	Hepatic toxicity: hold until bilirubin <1.5x institutional ULN and transaminases <2.5x institutional ULN; adult dose may then reduce from 400 mg to 300 mg. CP-CML cytopenias: hold until ANC ≥1.5 x 10^9/L and platelets ≥75 x 10^9/L; resume 400 mg, or reduce to 300 mg if cytopenia recurs. Severe nonhematologic AEs: hold until resolved, then resume based on initial severity.
Nilotinib	QTc >480 msec Cytopenias: ANC <1.0 x 10^9/L and/or platelets <50 x 10^9/L Lipase/amylase ≥ grade 3 Bilirubin ≥ grade 3 in adults Hepatic transaminases ≥ grade 3 Moderate/severe nonhematologic toxicity	QTc >480 msec: hold, correct potassium/magnesium if low, and review concomitant medications. Resume within 2 weeks at prior dose if QTcF returns to <450 msec and within 20 msec of baseline. If QTcF remains 450-480 msec after 2 weeks, reduce adult dose to 400 mg once daily. Discontinue if QTcF >480 msec recurs after dose reduction. Cytopenias: hold and monitor; resume prior dose if recovery occurs within 2 weeks, or reduce to 400 mg once daily if counts remain low >2 weeks. Selected lab abnormalities and moderate/severe nonhematologic AEs may require hold until recovery and resume at 400 mg once daily; discontinue if toxicity recurs after reduction.
Ponatinib	Cardiovascular/cerebrovascular arterial occlusive events; peripheral vascular AOE or VTE; heart failure; hepatotoxicity; pancreatitis/lipase elevation; myelosuppression; grade ≥2 or recurrent nonhematologic AEs	CP-CML response-based dosing: 45 mg once daily with reduction to 15 mg once daily after BCR::ABL1IS ≤1%, as directed. For adverse reactions, common reduction steps are 45 mg to >30 mg to >15 mg to >10 mg once daily. Cardiovascular/cerebrovascular AOE: grade 1 hold until resolved then resume same dose; grade 2 hold until grade 0-1 then resume next lower dose and discontinue if recurrent; grade 3-4 discontinue. Peripheral vascular AOE/VTE: grade 4 discontinue; grade 3 hold until grade 0-1 then resume next lower dose and discontinue if recurrent. Heart failure: grade 2-3 hold until grade 0-1 then resume next lower dose; discontinue if recurrent; grade 4 discontinue. Hepatotoxicity: AST/ALT >3x ULN hold until grade 0-1 then resume next lower dose; discontinue for AST/ALT ≥3x ULN with bilirubin >2x ULN and alkaline phosphatase <2x ULN. Pancreatitis/lipase elevation: hold based on severity until symptom/lipase recovery; symptomatic pancreatitis with lipase >5x ULN requires discontinuation. Myelosuppression: ANC <1 x 10^9/L or platelets <50 x 10^9/L hold until ANC ≥1.5 x 10^9/L and platelets ≥75 x 10^9/L, then resume; reduce if recurrent.