NOVARTIS

For Hematology and Oncology Centers Using OncoEMR®

Help With Identifying Ph+ CML-CP Patients for Treatment Evaluation

This Guide Provides an Overview for Using Patient Reports and Alerts to Identify Ph+ CML-CP Patients for Evaluation.

Ph+ CML-CP, Philadelphia Chromosome Positive Chronic Myeloid Leukemia Chronic Phase.

Using This Guide and EHR Worksheets

This Guide is not intended to provide any clinical advice or recommendations, which are solely the responsibility of the health system. Please see the important statistics on the following page that highlight the unmet needs of CML patients who are struggling with drug resistance, unmanageable side effects, or other suboptimal results with treatment.

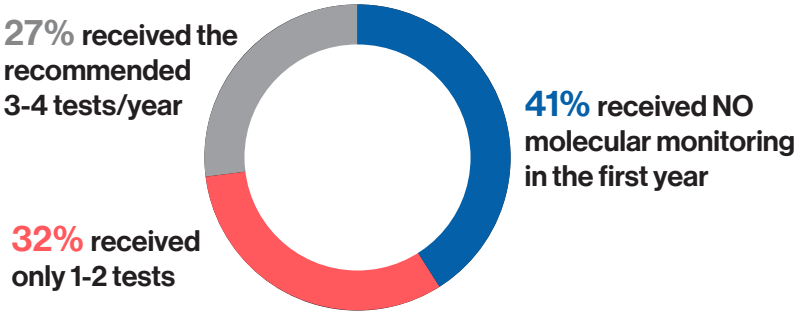
This Guide can help clinical decision makers implement automated EHR functionalities to identify and evaluate care for Ph+ CML-CP patients who may benefit from a treatment switch. It provides examples of Patient Reports and Alerts, along with EHR Worksheets. The EHR Worksheets provide a list of criteria and/or actions to consider including when creating Patient Reports and Alerts. The EHR Worksheet can be customized, saved, and reused. It does not constitute guidance for medical advice or treatment.

The information listed in this Guide is based upon the most recent version of OncoEMR. Functions and features may change as new software versions are released. The Guide and EHR Worksheet are meant to serve as educational examples only and should not replace detailed instructions provided to you by your internal or external EHR support resources. Screen images shown within represent hypothetical screens in OncoEMR. Novartis makes no claims or warranties about the applicability or appropriateness of this information and does not endorse specific EHR systems.

EHR, Electronic Health Record.

Real-world evidence reveals significant underutilization of molecular monitoring

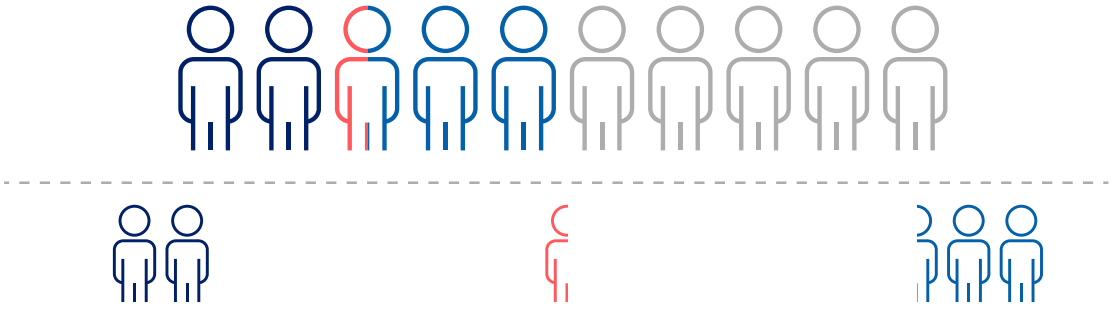
A claims database review of 1205 patients with newly diagnosed CML found that[1]:



Studies suggest that <30% of patients with CML are monitored according to clinical practice guidelines during the first year of TKI treatment.[1]

Lack of initial response, resistance, and intolerance are key drivers of treatment discontinuation of TKI therapy

In a study of 119 patients with CML-CP treated with 2L TKIs, 52% discontinued 2L TKI due to resistance or intolerance[2]



19% discontinued due to primary resistance (lack of initial response)[2,a]

7% discontinued due to secondary resistance[2,b]

26% discontinued due to intolerance[2,c]

TKI, Tyrosine Kinase Inhibitor.

[a]Primary resistance is defined as lack of efficacy (failure to achieve landmark responses) from the onset of treatment.[3]
[b]Secondary resistance, also known as acquired resistance, is considered loss of response to treatment.[4]
[c]Intolerance is considered when a patient develops an adverse event that cannot be managed through dose reduction or treatment of symptoms.[5]

Treatment intolerance may lead to nonadherence in patients receiving TKI therapy

Treatment intolerance may lead to nonadherence in patients receiving TKI therapy

Some patients are intolerant to TKIs,

with up to ~25% of patients discontinuing treatment due to an adverse event[6]

Up to ~30% of patients with CML are nonadherent.[7]

Nonadherence may be a factor associated with higher health care costs, suboptimal response, disease progression, and mortality[8-10]

EHR Capabilities Can Help to Stratify CML Patients

Clinical champions within an organization can advocate for the configuration of EHR capabilities such as Patient Reports and Alerts.

• If you would like to set up a Report or an Alert, submit a request to OESupport@flatiron.com

Role of Patient Reports

Patient Reports are OncoEMR system reports that can be used to stratify patients with CML. Patient Reports can be generated using system reports provided within OncoEMR. Those Patient Reports which require more complex criteria can also be requested from OncoEMR Support.

Patient Reports can be used to demonstrate and champion the need for follow-up care within an organization. They can also be used for planning purposes to understand for which patients an Alert would display.

Available criteria to generate these reports can include patient gender, age, diagnosis, lab result values, and medications.

Patient Lab Results

From: 8/1/2023 - To: 11/29/2023

Report Parameter Selections	MDs Selected	Locations Selected
Problem: C92.1 Medication: TKI Medication	All MDs	All

Labs Selected	Patients Selected
BCR::ABL	All Patients

Patient Name	MRN	Date of Birth	Sex	Primary DX ICD 10 Codes	Medication	Result	Order Date
Smith, Betty	8013335459	11/1/1933	Female	C92.10	TKI Medication	0.0178	8/3/2023
Jones, Sam	8013345789	5/4/1988	Male	C92.10	TKI Medication	0.0137	10/20/2023
Abner, Darlene	8013238521	1/25/1970	Female	C92.10	TKI Medication	0.0142	11/20/2023
Carlson, Sandra	8013208132	4/23/1974	Female	C92.10	TKI Medication	0.0165	11/14/2023

Hypothetical example of a Patient Report

EHR Capabilities Can Help to Stratify CML Patients (continued)

Role of Alerts

As part of an organization's care quality EHR initiative, Alerts can help proactively identify at-risk Ph+ CML-CP

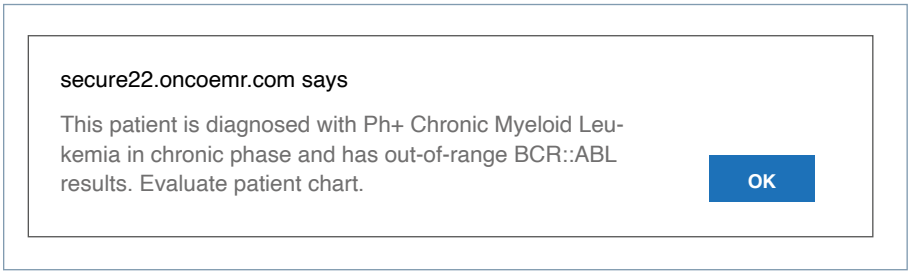
patients with unmet needs when they come in for an appointment.

Alerts can be configured in a meaningful way which specifies the patient criteria and milestones within the EHR workflow.

OncoEMR enables the setup of Alerts using a Patient Report to determine which charts should be reviewed for potential alert notification.

Add an Alert to Patient Account

Using the Patient Report created in previous section, practice staff can review patient charts and add manual Alerts which will display when the chart is opened.



Hypothetical example of the displayed Alert

Additional detailed, specific chart alerts based on clinical criteria can be requested from OncoEMR support.

BCR, breakpoint cluster region; ABL, Abelson.

Optional Use of EHR Worksheets in This Guide

An interactive, digital EHR worksheet that follows is intended to assist health systems in configuring their EHR capabilities to help identify Ph+ CML-CP patients in need of additional care. It outlines the criteria that need to be defined in an IT request for creating Patient Reports and Alerts.

The EHR Worksheet can help translate desired clinical parameters for identifying CML patients with suboptimal results from CML treatment into categories and values for EHR functions. Once the EHR Worksheet is completed, it can be saved under a new name. Then, the EHR Worksheet can be reused or edited if the criteria selected results in a patient population that is too broad or too narrow.

The codes are provided for reference purposes only and may not be all inclusive. The responsibility to determine coverage and reimbursement parameters, and appropriate coding for a particular patient and/or procedure, is always the responsibility of the physician. The EHR Worksheet includes categories of selection criteria for health systems to consider when seeking to identify and evaluate appropriate patients.

Actions for a clinical champion:

1

Start by selecting the inclusion criteria to define the specific search parameters for finding and evaluating CML patients with suboptimal results from CML treatment.

2

Then, specify the data that will be displayed on the Patient Report by selecting columns for provider evaluation and review. After reviewing the Patient Report, clinical champions may wish to broaden or narrow the criteria and values to refine the list of patients according to their preferences.

3

Utilizing the criteria in Step 1, choose the Alert that will prompt treatment evaluation by care team members.

The following pages help identify TKI-resistant and/or intolerant patients with specific criteria:

- Patients with a missing or overdue BCR::ABL test
- Patients who are non-compliant with TKI medication prescriptions that have lapsed
- Patients who are not meeting treatment milestones and may be TKI-resistant
- Patients who are struggling with side effects and may be TKI-intolerant

Patient With a Missing or Overdue BCR::ABL Test

Before you begin to build on this topic, it's important to consider several key technical questions that will influence the impact of your BCR::ABL program.

Technical Considerations:

Are results interfaced back to your EHR?

OPTION	ACTIONS
Yes – our results interface returns BCR::ABL results and completes the original order	Proceed with EHR report and Alert build
No – we don't receive results digitally to our EHR	Do not proceed with build – pursue an interfaced result option with your interfaces team before moving forward

If yes above, are interfaced results filed to discrete result values in your EHR?

OPTION	ACTIONS
Yes – our results interface returns BCR::ABL results and completes the original order	Proceed with EHR report and Alert build
No – we don't receive results digitally to our EHR	Do not proceed with build – pursue an interfaced result option with your interfaces team before moving forward

Operational Impact:

If you are not receiving discrete results for your BCR::ABL tests, the build is still possible but there is a greater operational burden placed upon the program.

Reports that are built to identify patients with missing or overdue results will return patients who have had the order completed but the EHR won't be able to return that data. This places the onus of follow-up onto whoever is managing the reports and the population. In other words, operational owners running these reports will need to do manual follow-up in the chart or with the patient directly to determine if the result was completed and then manually key those results into the patient's chart.

Given the relatively small size of the population who would be doing this testing, this may not be a significant lift and may be worth it for your organization. However, it's important to plan for the additional workload.

Patient With a Missing or Overdue BCR::ABL Test

Inclusion Criteria for Patient Report and Alert

INCLUSION CRITERIA

CATEGORY ("AND" CRITERIA)	✓	VALUES		
Patient Status		Alive		
Population (select one)		Only my patients		
		Seen in my department		
		All patients who meet the criteria		
		Other		
Age (eg ≥18)		> <		
Diagnosis/ Clinical Findings (select ≥ 1) "or" criteria	✓	**Description**	**Code Set**	**Code[11,12]**
		chronic myeloid leukemia, BCR::ABL positive	ICD-10	C92.10
		chronic myeloid leukemia, BCR::ABL positive, in remission	ICD-10	C92.11
		chronic myeloid leukemia, BCR::ABL positive, in relapse	ICD-10	C92.12
		chronic myeloid leukemia, disease; disorder	SNOMED	92818009
		myeloid leukemia in relapse; disorder	SNOMED	122901000119109
		relapsing chronic myeloid leukemia; disorder	SNOMED	415287001
		chronic myeloid leukemia category; morphologic abnormality	SNOMED	413841000
		chronic phase chronic myeloid leukemia; disorder	SNOMED	413847001
Lab tests missing or overdue (select a lab test and specify a date range)	✓	**Description**	**Code Set**	**Code[13]**
		t(9,22)(ABL1,BCR) Translocation [Presence] in Blood or Tissue by Molecular genetics method	LOINC	21821-4
			Local	
	BCR::ABL Date Range Date of BCR::ABL lab result (eg, greater than 6 months is [>m-6])		Date range: -	

Patient With a Missing or Overdue BCR::ABL (continued)

Exclusion Criteria for Patient Report and Alert

	CATEGORY ("AND" CRITERIA)	✓	VALUES		
EXCLUSION CRITERIA	**Patients who have had a BCR::ABL ordered in the past X days**	✓	**Description**	**Code Set**	**Code[13]**
			BCR::ABL1 kinase domain targeted mutation analysis	LOINC	55135-8
				Local	
		BCR::ABL Order Date Range Timeframe for capturing BCR::ABL order (eg, [m-1] for 30 days)		Date range: -	
	Patients who have had a BCR::ABL result in the past X days (select a lab test and specify a date range)	✓	**Description**	**Code Set**	**Code[13]**
			t(9,22)(ABL1,BCR) Translocation [Presence] in Blood or Tissue by Molecular genetics method	LOINC	21821-4
				Local	
		BCR::ABL Date Range Date of BCR::ABL lab result (eg, greater than 6 months is [>m-6])		Date range: -	

Patient With a Missing or Overdue BCR::ABL (continued)

Report Output Columns

REPORT OUTPUT COLUMNS

CATEGORY	✓	VALUES		
Patient Demographics		Patient ID (MRN)		
		Name		
		DOB		
		Phone Number		
		Patient Portal Status		
Diagnosis/ Clinical Findings	✓	**Description**	**Code Set**	**Code[11,12]**
		chronic myeloid leukemia, BCR::ABL positive	ICD-10	C92.10
		chronic myeloid leukemia, BCR::ABL positive, in remission	ICD-10	C92.11
		chronic myeloid leukemia, BCR::ABL positive, in relapse	ICD-10	C92.12
		chronic myeloid leukemia, disease; disorder	SNOMED	92818009
		myeloid leukemia in relapse; disorder	SNOMED	122901000119109
		relapsing chronic myeloid leukemia; disorder	SNOMED	415287001
		chronic myeloid leukemia category; morphologic abnormality	SNOMED	413841000
		chronic phase chronic myeloid leukemia; disorder	SNOMED	413847001
Payer		Insurance Coverage Name		
Last Documented BCR::ABL Results		LOINC Code		
		Description		
		Value		
		Date		
Additional Clinical Criteria				

Patient With a Missing or Overdue BCR::ABL (continued)

Alert Content

	CATEGORY	✓	VALUES
ALERT CONTENT	**Alert Name (eg, Patients with missing/ overdue BCR::ABL.)**		
	Message to include in Alert (eg, "This patient with CML has missing BCR::ABL lab tests.")		
	Data to include in Alert		Most recent BCR::ABL lab value
			Diagnosis
			Additional Clinical Criteria
	Clinical actions to take based on the Alert		CML Order Set Name #
			Order BCR::ABL lab test
			Order Appropriate Medication
			Add Diagnosis C92.10
			Additional Orderable Items to Include

Noncompliant Patient

Before you begin to build on this topic, it's important to consider several key technical questions that will influence the impact of your BCR::ABL program.

Technical Considerations:

Is medication adherence data returned by your e-prescribing vendor (ie, Surescripts)?

OPTION	ACTIONS
Yes – we receive data back from our eRx vendor on fills and other adherence items	Proceed with EHR report and Alert build
No – we don't receive any med adherence data	Proceed with EHR report and Alert build but note operational impact below

Operational Impact:

If you are not receiving TKI medication adherence data back from your vendor, the build is still possible but there is a greater operational burden placed upon the program.

Reports that are built to identify patients with late or missing medication fill data will return patients who may have had the medication filled despite data showing the opposite. This places the onus of follow-up onto whoever is managing the reports and the population. In other words, operational owners running these reports will need to do manual follow-up in the chart or with the patient directly to determine if the medication was filled.

Given the relatively small size of the population, this may not be a significant lift and may be worth it for your organization. However, it's important to plan for the additional workload.

Noncompliant Patient

Inclusion Criteria for Patient Report and Alert

INCLUSION CRITERIA

CATEGORY ("AND" CRITERIA)	✓	VALUES		
Patient Status		Alive		
Population (select one)		Only my patients		
		Seen in my department		
		All patients who meet the criteria		
		Other		
Age (eg ≥18)		> <		
Diagnosis/ Clinical Findings (select ≥ 1) "or" criteria	✓	**Description**	**Code Set**	**Code[11,12]**
		chronic myeloid leukemia, BCR::ABL positive	ICD-10	C92.10
		chronic myeloid leukemia, BCR::ABL positive, in remission	ICD-10	C92.11
		chronic myeloid leukemia, BCR::ABL positive, in relapse	ICD-10	C92.12
		chronic myeloid leukemia, disease; disorder	SNOMED	92818009
		myeloid leukemia in relapse; disorder	SNOMED	122901000119109
		relapsing chronic myeloid leukemia; disorder	SNOMED	415287001
		chronic myeloid leukemia category; morphologic abnormality	SNOMED	413841000
		chronic phase chronic myeloid leukemia; disorder	SNOMED	413847001
Medications (to identify patients who have lapsed TKI therapies and may be struggling with side effects) "or" criteria **Note: Insert FDA approved TKIs (or other medications) here.**	✓	**Description**	**Code Set**	**Code**
		Patients who have TKI medications that have lapsed (eg, 30-day prescription + 2 refills = 90 days supply, current date is >90 days from the original prescription, and not renewed with additional refills)	Lookback period: (starting today) or Date range: -	

Noncompliant Patient (continued)

Exclusion Criteria for Patient Report and Alert

EXCLUSION CRITERIA	CATEGORY	✓	VALUES		
	Health system to add exclusion criteria if desired	✓	Description	Code Set	Code

Noncompliant Patient (continued)

Report Output Columns

REPORT OUTPUT COLUMNS

CATEGORY	✓	VALUES		
Patient Demographics		Patient ID (MRN)		
		Name		
		DOB		
		Phone Number		
		Patient Portal Status		
Diagnosis/ Clinical Findings	✓	**Description**	**Code Set**	**Code[11,12]**
		chronic myeloid leukemia, BCR::ABL positive	ICD-10	C92.10
		chronic myeloid leukemia, BCR::ABL positive, in remission	ICD-10	C92.11
		chronic myeloid leukemia, BCR::ABL positive, in relapse	ICD-10	C92.12
		chronic myeloid leukemia, disease; disorder	SNOMED	92818009
		myeloid leukemia in relapse; disorder	SNOMED	122901000119109
		relapsing chronic myeloid leukemia; disorder	SNOMED	415287001
		chronic myeloid leukemia category; morphologic abnormality	SNOMED	413841000
		chronic phase chronic myeloid leukemia; disorder	SNOMED	413847001
Payer		Insurance Coverage Name		
Last Documented BCR::ABL		LOINC Code		
		Description		
		Value		
		Date		
TKI Prescription Activity		Active TKI Medication Name		
		Date Prescribed		
		End Date		
		Previous TKI Medication Name		
		Date Prescribed		
		End Date		
Care Team Member		Care Team Member Name		
Additional Clinical Criteria				

Noncompliant Patient (continued)

Alert Content

	CATEGORY	✓	VALUES
ALERT CONTENT	**Alert Name (eg, Patients who are non-compliant.)**		
	Message to include in Alert (eg, "This patient with CML has TKI medications that have lapsed.")		
	Data to include in Alert		Current TKI Prescription
			Date TKI Prescribed
			Additional Clinical Criteria
	Clinical actions to take based on the Alert		CML Order Set Name #
			Order BCR::ABL lab test
			Order Appropriate Medication
			Add Diagnosis C92.10
			Additional Orderable Items to Include

Patient Not Meeting Milestones

Before you begin to build on this topic, it's important to consider several key technical questions that will influence the impact of your BCR::ABL program.

Technical Considerations:

Are results interfaced back to your EHR?

OPTION	ACTIONS
Yes – our results interface returns BCR::ABL results and completes the original order	Proceed with EHR report and Alert build
No – we don't receive results digitally to our EHR	Do not proceed with build – pursue an interfaced result option with your interfaces team before moving forward

If yes above, are interfaced results filed to discrete result values in your EHR?

OPTION	ACTIONS
Yes – results file to discrete components in the patients chart in a usable data format	Proceed with EHR report and Alert build
No – results file as a PDF/image to the chart in a generic, non-reportable format	Proceed with EHR report and Alert build but note operational impact below

Operational Impact:

If you are not receiving discrete results for your BCR::ABL tests, the build is still possible but there is a greater operational burden placed upon the program.

Reports that are built to identify patients with missing or overdue results will return patients who have had the order completed but the EHR won't be able to return that data. This places the onus of follow-up onto whoever is managing the reports and the population. In other words, operational owners running these reports will need to do manual follow-up in the chart or with the patient directly to determine if the result was completed and then manually key those results into the patients chart.

Given the relatively small size of the population who would be doing this testing, this may not be a significant lift and may be worth it for your organization. However, it's important to plan for the additional workload.

Patient Not Meeting Milestones

Inclusion Criteria for Patient Report and Alert

	CATEGORY ("AND" CRITERIA)	✓	VALUES		
INCLUSION CRITERIA	**Patient Status**		Alive		
	Population (select one)		Only my patients		
			Seen in my department		
			All patients who meet the criteria		
			Other		
	Age (eg ≥18)		> <		
	Diagnosis/ Clinical Findings (select ≥ 1) "or" criteria	✓	**Description**	**Code Set**	**Code [11,12]**
			chronic myeloid leukemia, BCR::ABL positive	ICD-10	C92.10
			chronic myeloid leukemia, BCR::ABL positive, in remission	ICD-10	C92.11
			chronic myeloid leukemia, BCR::ABL positive, in relapse	ICD-10	C92.12
			chronic myeloid leukemia, disease; disorder	SNOMED	92818009
			myeloid leukemia in relapse; disorder	SNOMED	122901000119109
			relapsing chronic myeloid leukemia; disorder	SNOMED	415287001
			chronic myeloid leukemia category; morphologic abnormality	SNOMED	413841000
			chronic phase chronic myeloid leukemia; disorder	SNOMED	413847001

Patient Not Meeting Milestones (continued)

Inclusion Criteria for Patient Report and Alert (continued)

INCLUSION CRITERIA	CATEGORY ("AND" CRITERIA)	✓	VALUES		
	Lab Tests	✓	**Description**	**Code Set**	**Code[13]**
			BCR::ABL1 kinase domain targeted mutation analysis	LOINC	55135-8
				Local	
		BCR::ABL Date Range Date of BCR::ABL lab result (eg, greater than 6 months is [>m-6])		Lookback period: (starting today) or Date range: -	
		BCR::ABL Lab Value Range Capturing out-of-range BCR::ABL lab test (eg, >0.1%, 0.1% - 1%, >1%)		Value: > <	
	Patients TKI activity	✓	**# of Current and Previous TKI Therapies**		
			≥		

Patient Not Meeting Milestones (continued)

Exclusion Criteria for Patient Report and Alert

	CATEGORY ("AND" CRITERIA)	✓	VALUES		
EXCLUSION CRITERIA	**Exclude patients with TKI history (eg, <2)**	✓	**# of Current and Previous TKI Therapies**		
			<		
	Exclude patients who have had a recent BCR::ABL ordered within 3 or 6 months	✓	**Description**	**Code Set**	**Code[13]**
			BCR::ABL1 kinase domain targeted mutation analysis	LOINC	55135-8
				Local	
		BCR::ABL Future Date Range Timeframe for capturing BCR::ABL order (eg, m-6)		Lookback period: (starting today) or Date range: -	

Patient Not Meeting Milestones (continued)

Report Output Columns

REPORT OUTPUT COLUMNS

CATEGORY	✓	VALUES		
Patient Demographics		Patient ID (MRN)		
		Name		
		DOB		
		Phone Number		
		Patient Portal Status		
Diagnosis/ Clinical Findings	✓	**Description**	**Code Set**	**Code[11,12]**
		chronic myeloid leukemia, BCR::ABL positive	ICD-10	C92.10
		chronic myeloid leukemia, BCR::ABL positive, in remission	ICD-10	C92.11
		chronic myeloid leukemia, BCR::ABL positive, in relapse	ICD-10	C92.12
		chronic myeloid leukemia, disease; disorder	SNOMED	92818009
		myeloid leukemia in relapse; disorder	SNOMED	122901000119109
		relapsing chronic myeloid leukemia; disorder	SNOMED	415287001
		chronic myeloid leukemia category; morphologic abnormality	SNOMED	413841000
		chronic phase chronic myeloid leukemia; disorder	SNOMED	413847001
Payer		Insurance Coverage Name		
All BCR::ABL lab results in last 24 months		LOINC Code		
		Description		
		Value		
		Date		
TKI Prescription Activity		Date Prescribed		
		Name of TKI Prescribed		
Additional Clinical Criteria				

Patient Not Meeting Milestones (continued)

Alert Content

	CATEGORY	✓	VALUES
ALERT CONTENT	**Alert Name (eg, Patients who are resistant to TKI therapy.)**		
	Message to include in Alert (eg, "This patient with CML has outdated lab values or This patient has out-of-range lab values.")		
	Data to include in Alert		Current TKI Prescription
			Date TKI Prescribed
			BCR::ABL LOINC code
			Description
			Value (list all values for last 24 months)
			Date (list all dates for last 24 months)
			Additional Clinical Criteria
	Display Restrictions		Care team member
			Other
	Clinical actions to take based on the Alert		CML Order Set Name #
			Order BCR::ABL lab test
			Order Appropriate Medication
			Add Diagnosis C92.10
			Additional Orderable Items to Include

Establishing a Flowsheet

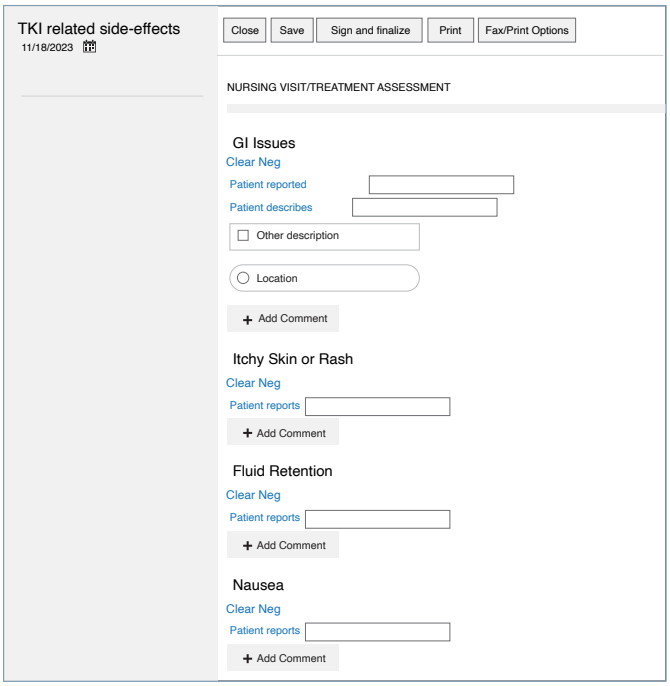
Identifying a TKI-intolerant patient is supported by the gathering of discrete side effect data. Early screening and tracking of those side effects in the EHR are important for patient care.

One method of side-effect tracking is to create a Nursing Assessment Flowsheet using Grading Scales for each side effect. The Flowsheet can be used to add the assessments and view them over time.

- If you would like to build a Nursing Assessment Flowsheet, submit a request to OESupport@flatiron.com

	Scale Type	Name		Attributes			Internal ID
Edit	Symptom Assessment	Fluid Retention	Edit Defs	BG: CTCAE V4			TKIFluRetention
Edit	Symptom Assessment	GI Issues	Edit Defs	BG: CTCAE V4			TKIGIIssues
Edit	Symptom Assessment	Itchy Skin or Rash	Edit Defs	BG: CTCAE V4			TKIItchRash
Edit	Symptom Assessment	Memory Issues	Edit Defs	BG: CTCAE V4			TKIMemIssues
Edit	Symptom Assessment	Nausea	Edit Defs	BG: CTCAE V4			TKISymNausea
Edit	Symptom Assessment	Numbness Tingling Prickling	Edit Defs	BG: CTCAE V4			TKISumNumbess
Edit	Symptom Assessment	Fatigue	Edit Defs	BG: CTCAE V4			GSFatFatigue

Hypothetical example of Grading Scales set up screen



Hypothetical example of Potential Side Effect Data Entry

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