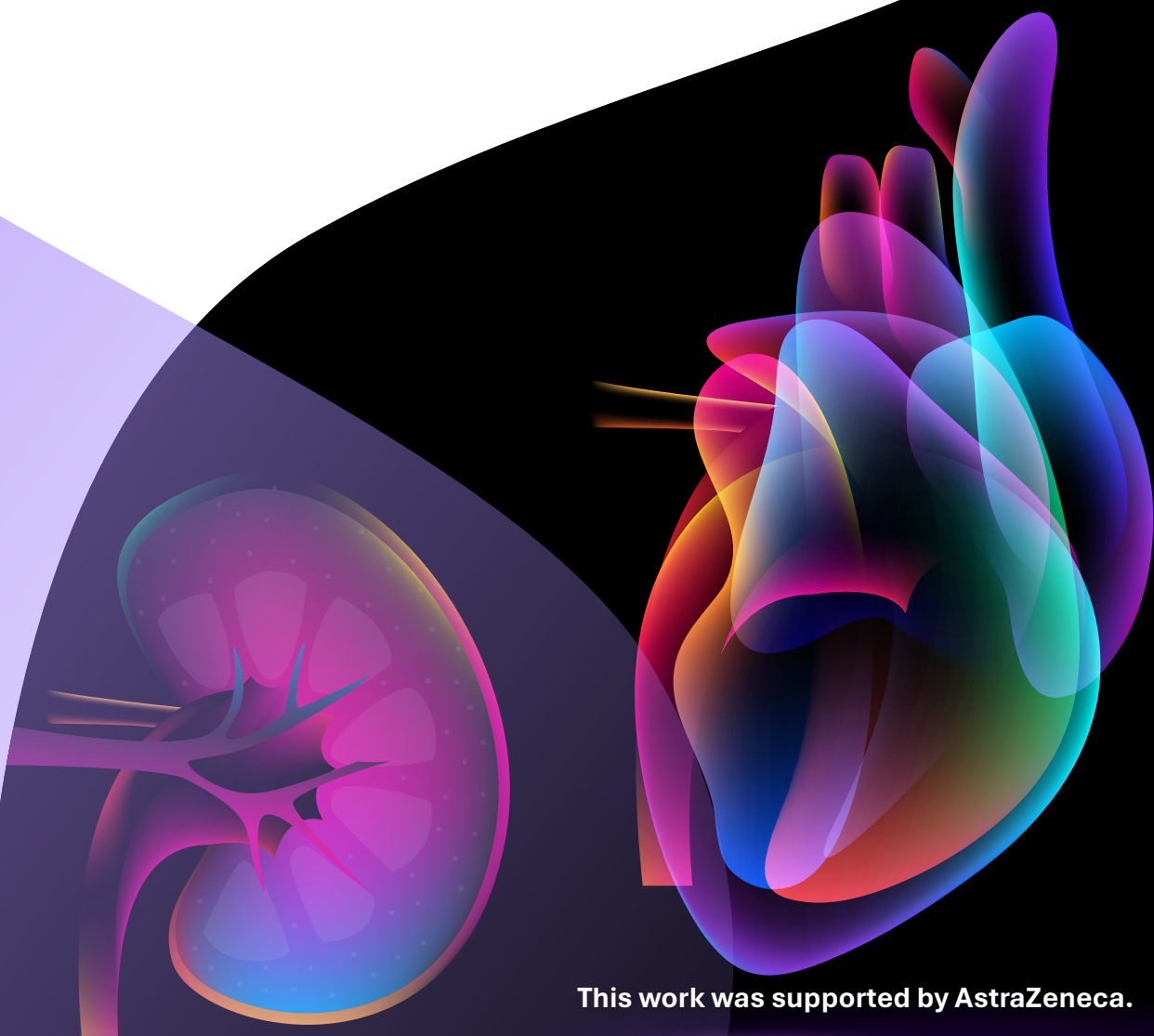


Hyperkalemia Care Pathway

IMPLEMENTATION GUIDE

A Resource to Support Organizations in Adopting
an Outpatient Hyperkalemia Care Pathway



This work was supported by AstraZeneca.

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Foreword From the Expert Committee

Thank you for accessing the **Hyperkalemia Care Pathway Implementation Guide**.

In June 2025, a **multidisciplinary group of experts** was convened to **identify and address barriers to optimal hyperkalemia care delivery**. The group identified a need to develop a **consensus-based hyperkalemia care pathway** with cross-service line applicability.

In 2026, an **Implementation Expert Committee** was formed and developed an independent **consensus hyperkalemia care pathway** for the diagnosis, risk classification, management, and monitoring of **patients with mild to moderate hyperkalemia in the outpatient setting**.

While not highly prevalent (1%-2%) in the general population, hyperkalemia appears more frequently over time in patients with **chronic kidney disease** (CKD) (28.1%), **CKD and type 2 diabetes** (T2D) (39.6%), or **heart failure** (49.1%).¹⁻² It is also more common in patients **prescribed mineralocorticoid receptor antagonists** (MRA) (42.7%) or **renin-angiotensin-aldosterone system inhibitors** (RAASi) (31.5%).² Left untreated, hyperkalemia can cause weakness, ascending paralysis, respiratory failure, cardiac arrhythmia, and eventually cardiac arrest and death.³

Hyperkalemia is a highly **manageable condition** with dietary and therapeutic interventions available and clear guidelines for management of severe/emergency cases. However, limited guidance exists to assist clinicians and patients in managing mild to moderate hyperkalemia. We hope this Implementation Guide can serve as a **resource for clinicians**, particularly internal medicine providers and cardiologists, **in diagnosing, risk-classifying, managing, and monitoring patients with hyperkalemia**.

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INTRODUCTION



Introduction

Why Care Pathways Matter

Care pathways present critical opportunities to improve clinical outcomes and operational efficiency. Care pathways have been shown to reduce clinical complications by standardizing processes, minimizing variability, improving adherence to evidence-based care, reducing avoidable utilization, enhancing cost-effective care, and reducing fragmentation, which is especially important in a disease like hyperkalemia, in which patients may be dealing with multiple cardiovascular-kidney-metabolic (CKM) conditions and experiencing transitions of care.⁴⁻⁸ These outcomes can ultimately benefit the patient, provider, and payer.

Hyperkalemia Overview

Hyperkalemia, defined by serum potassium (K⁺) greater than 5 mmol/L, is a potentially life-threatening disorder common in patients with chronic kidney disease (CKD) and heart failure (HF) due to the prescription of guideline-directed medical therapies (GDMTs), such as renin-angiotensin-aldosterone system inhibitors (RAASIs) or mineralocorticoid receptor antagonists (MRAs).⁹⁻¹⁰

Prevalence & Key Risk Factors

Patients with **CKD** are at up to **50% risk** of developing **chronic hyperkalemia**. Decreasing kidney function, past myocardial infarction, advanced age, acute kidney injury (AKI), obesity, and diabetes all increase incidence.⁹ Hyperkalemia risk is augmented by several GDMTs commonly prescribed to reduce cardiovascular morbidity and mortality.⁹

Symptoms

Hyperkalemic patients are often asymptomatic, but may report nonspecific symptoms such as palpitations, nausea, muscle pain, weakness, dyspnea, or paresthesia.⁹

Introduction (cont'd)

Hyperkalemia in the Outpatient Setting

Hyperkalemia is frequently detected in the outpatient setting during routine laboratory monitoring, especially among patients with CKD, HF, diabetes, or those treated with RAASi or MRAs.¹¹⁻¹²

Outpatient management typically involves confirming the potassium value, reviewing and adjusting contributing medications, providing dietary counseling, and initiating oral potassium-lowering therapies when indicated.¹² Newer K⁺ binders, such as patiomer and sodium zirconium cyclosilicate (SZC), have enabled the continuation of GDMTs in hyperkalemic patients, further enabling outpatient management.¹²



Most mild to moderate cases can be safely managed without hospitalization, and effective outpatient management helps prevent unnecessary discontinuation of GDMTs.¹²

Economic Impact of Hyperkalemia

Hyperkalemia imposes substantial **economic burden** on the US healthcare system, driven largely by **hospitalizations, emergency department (ED) utilization**, and care for **recurrent or chronic hyperkalemia**.¹³

\$15,983
in excess annual
healthcare costs



Per patient with hyperkalemia compared with matched normokalemic patients in a large US claims-based analysis¹³

\$30,379
in higher
healthcare costs



For patients in the year following a hyperkalemia-related hospitalization, accompanied by higher rates of admissions, readmissions, ED visits, outpatient encounters, and longer hospital stays¹³

Introduction (cont'd)

Why Early Screening for Hyperkalemia Matters

Early identification of hyperkalemia is critical: All-cause mortality significantly increases for every 0.1 mmol/L rise in serum potassium ≥ 5.0 mmol/L.¹⁴

Screening for hyperkalemia through routine basic metabolic panels (BMPs) is essential for safely managing patients receiving GDMTs, including RAASi and MRAs, for cardiovascular conditions.⁹ RAASi reduce aldosterone secretion, while MRAs inhibit aldosterone receptor activity.⁹ Both mechanisms lead to reduced potassium secretion by the kidneys, potentially triggering hyperkalemia.⁹ Risk for hyperkalemia is exacerbated in patients with already reduced renal sufficiency as a result of CKD, HF, diabetes mellitus, or older age.⁹ Patients with CKD alone are at a 5% to 50% risk of developing chronic hyperkalemia.⁹

Hyperkalemia often prompts reactive down-titration or discontinuation of GDMTs, undermining the therapies that reduce mortality and hospitalization in patients with CKD and HF.¹⁵ While stopping MRAs may reduce recurrent hyperkalemia, studies have linked MRA discontinuation with a 10% to 30% rise in downstream mortality from cardiovascular events, underscoring the significant clinical trade-off.¹⁵ RAASi discontinuation after a hyperkalemia event has been linked with a 37% worse survival probability.¹⁶

Benefits of Standardized Pathway Adoption

Despite the availability of guidance addressing acute stabilization and elements of chronic management, there remains no unified, stepwise outpatient pathway that integrates verification, risk classification, treatment sequencing, monitoring cadence, and referral criteria across primary care, cardiology, and nephrology for outpatient hyperkalemia management. While nephrologists routinely manage hyperkalemia and report greater comfort with maintaining GDMTs and using medical strategies such as potassium binders, cardiologists and primary care providers (PCPs) demonstrate lower confidence and are more likely to discontinue GDMTs or refer patients to specialists.¹⁷

The Outpatient Hyperkalemia Care Pathway was developed to empower PCPs and cardiologists to manage mild and moderate hyperkalemia in the outpatient setting through standardized guidance, ultimately leading to less variability in patient care.

PRE-IMPLEMENTATION PLANNING



Getting Started

Before implementing the Outpatient Hyperkalemia Care Pathway, organizations should assess their current state, align goals, and prepare the clinical, operational, and digital foundations required for successful implementation. This pre-implementation phase helps identify gaps, align resources, and ensure readiness for pathway adoption across care settings.

In this section, you will learn how to:

Step
1

Define the Problem Statement

- Identify the suboptimal component of hyperkalemia care delivery you are trying to solve for
- Evaluate any available baseline data to validate, the problem statement and inform implementation aims
- Understand the root cause(s) driving the suboptimal process/outcome or area for improvement and ensure that you are designing the right solution for the right problem

Step
2

Align on Implementation Aims

- Establish clear, measurable aims to guide implementation and evaluation

Step
3

Prepare the Rollout Plan

- Define the reach of the intervention (clinics, patient populations, phasing strategy)
- Identify, engage, and gain buy-in from relevant stakeholders involved in pathway adoption
- Consider your measurement plan

This approach borrows core tenets from both the DMAIC (define, measure, analyze, improve, control) and RE-AIM (reach, effectiveness, adoption, implementation, maintenance) frameworks for quality improvement and will ensure ample preparation prior to implementation.

Step
1

Define the Problem Statement

When seeking to improve your hyperkalemia care processes via care pathway optimization, you may consider a few questions:

- What is the specific problem I am solving for or improvement I am seeking to make? (problem statement)
- What is driving this current suboptimal process/outcome/gap? (root cause analysis)

In a moment, you'll combine what you've learned to help inform your rollout plan (see page 13).

Problem Statement

PROBLEM
Statement

Root Cause Analysis

Consider using the 5 Whys to get to the bottom of the problem statement or improvement opportunity.

WHY
Is That?

WHY
Is That?

WHY
Is That?

WHY
Is That?

WHY
Is That?



Tip

When considering the root cause, assess the broad spectrum of factors that could impact the problem (eg, people, processes, policies) and what data you have available to support your claims.

Align on Implementation Aims

Care Pathway Implementation Goals

Clarifying organizational goals for the Outpatient Hyperkalemia Care Pathway is a foundational step. Establishing clear aims and defining the initial scope ensures alignment across service lines and prepares the system for consistent, safe, and scalable implementation.

In a moment, you'll combine what you've learned to help inform your rollout plan (see page 13).

When establishing goals, consider the SMART framework:

S	Specific <i>What are you trying to achieve? (Who, what, where, how, why)</i>	- Where are there opportunities to improve our existing hyperkalemia care processes? - Where are there inefficiencies in the patient journey? - Why are we referring out mild or moderate cases, and can most of these cases be managed in the originating care settings?
M	Measurable <i>How will success be defined and measured?</i>	- How are we defining improvement in hyperkalemia patient outcomes and successful implementation of the care pathway? - Which data sources are most reliable and easiest to analyze? - Are these metrics meaningful to patients, clinicians, and/or quality improvement specialists?
A	Achievable <i>What is realistic and attainable?</i>	- What would need to be true to implement the pathway? - What resources do I need to operationalize (eg, service line leader buy-in, approval processes, electronic health record [EHR] infrastructure)? - Is there buy-in from others on the aims, approach, and measurement and sustainability plan?
R	Relevant <i>How is this relevant to others?</i>	- Does this initiative align with other institutional priorities or initiatives? - How will this impact PCPs, cardiologists, and nephrologists at my institution, and why should they care? - How will this impact patients?
T	Time-Bound <i>What is a realistic implementation timeline?</i>	- If I started care pathway planning tomorrow, realistically, when would the pathway go live? - What time horizon should I consider for the measurement period to see changes in process and outcomes measures?



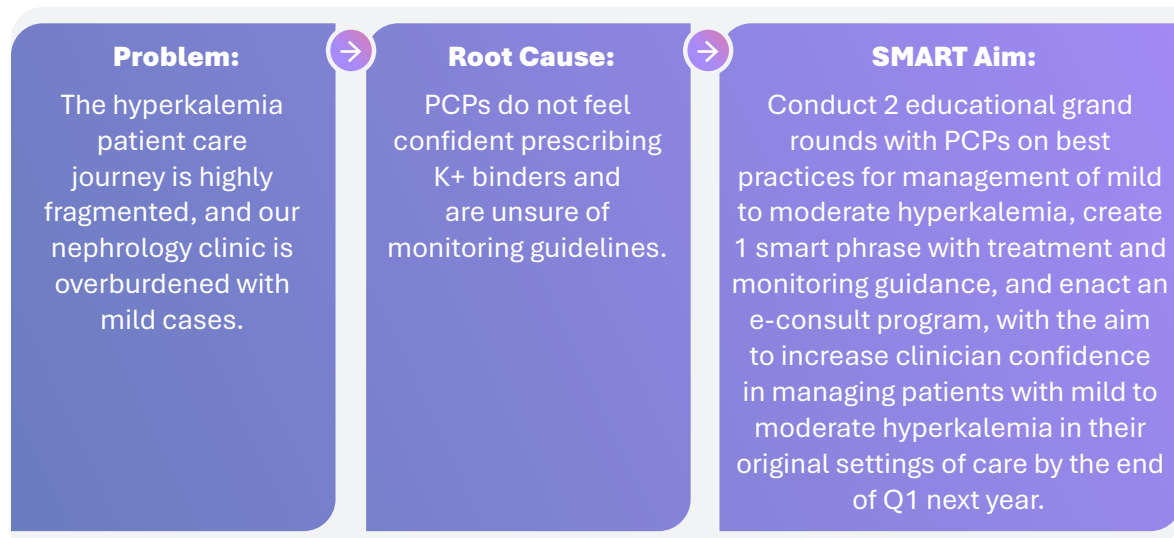
Tip

Ensure you are setting implementation aims that are within your control and that you are working with your target intervention audience to co-align on aims.

Worksheet

Now it's time to put it all together and apply what you've learned.

Example



Use the worksheet below to guide your hyperkalemia care pathway pre-implementation planning process.

PROBLEM Statement	<i>What problem or suboptimal process/outcome are you trying to address?</i>
ROOT Cause	<i>What is the main driver?</i>
SMART Aim:	<i>What is your specific, measurable, achievable, relevant, and time-bound approach to address the problem?</i>

Step
3

Prepare the Rollout Plan (cont'd)

Define the Intervention Scope

When getting ready to launch your care pathway optimization initiative, you must define the following:



Audience:

Who will be the target clinician audience (eg, PCPs, cardiologists, nephrologists, MDs/DOs/advanced practice providers [APPs]/care coordinators)? Who will be the target patient population (eg, general population, patients with CKD, patients on MRAs/RAASis)?



Reach:

Will your intervention be rolled out system-wide, to specific clinics, or phased out?



Approvals Needed:

What approvals will be necessary to proceed (eg, service line leadership, administrative approval, clinical decision support committee)?



Measurement Plan:

How will you evaluate if the intervention was effective?



Supporting Adoption:

How will you educate stakeholders on upcoming change and bring them along with you in implementing change?

Prepare the Rollout Plan (cont'd)

Sample Interventions & Considerations

Intervention Type	Sample Intervention	Description	Considerations
Provider & Care Team-Level	Education-based Intervention	Education-based approach to care pathway education	Examples include educational sessions (clinician-led presentation, case reviews, grand rounds) on the care pathway
	Back Office Process Change	Change to the back office process, altering the way care is delivered to a patient population	- Examples include prescreening patients with defined criteria prior to the appointment, ordering tests for patients with elevated labs, referring to wraparound services, etc - Typically, a manual process
	Provider Messaging	Direct provider messaging or consultation via EHR	- Examples include e-consults, in-basket messaging, etc - Can be used to close referral loops and get specialist input prior to referral
	Smart Order Set ("SmartSets")	EHR-based, customized bundle of orders that can be established for a given clinical scenario	- Requires clinician action to activate - Some institutions allow clinicians to build their own; some may require information technology (IT) support
System-Level	Smart Phrase	EHR-based "dot phrase" that can auto-populate notes or auto-calculate values	- Requires clinician action to activate - Some institutions allow clinicians to build their own; some may require IT support
	Care Paths	EHR-based series of silent alerts that create a pathway for patients meeting criteria	- Automatically fires based on criteria - Not always highly visible; can be customized by institution
	Best Practice Advisory (BPA) or Our Practice Advisory (OPA)	EHR-based alert that fires for individuals meeting defined criteria	- Typically reserved for the highest priority/safety-oriented process steps - Automatically fires and requires action - Can contribute to alert fatigue

Prepare the Rollout Plan (cont'd)

Engage Relevant Stakeholder Groups and Bring Them Along in Pre-Implementation Planning

Implementing the Outpatient Hyperkalemia Care Pathway requires coordinated involvement from clinical and operational teams. Because hyperkalemia intersects primary care, cardiology, nephrology, pharmacy, and population health, **cross-functional engagement ensures consistent workflows, reduces care fragmentation, and supports safe outpatient management.**

Engaging stakeholders early helps strengthen communication, streamline care transitions, and build the shared ownership needed for pathway adoption and long-term sustainability.

Care Team Roles & Responsibilities

The tables below denote care team members frequently engaged for hyperkalemia (HK) care delivery. However, not every organization will have access to every resource. The important thing to remember is that anyone with a patient-facing role has the opportunity to improve patient care delivery. Whether a clinician, diagnostic tech, or front desk manager, make use of what resources you do have to improve care.

Primary Care (MDs, DOs, APPs)	Cardiology (MDs, DOs, APPs)	Nephrology (MDs, DOs, APPs)	Clinical Pharmacy (PharmDs)
• Identify patients with HK and evaluate further workup needed depending upon comorbidities (CKD, HF, diabetes) • Initiate treatment (dietary counseling, lifestyle change, K⁺ binder, GDMT, oral loop diuretics) • Ongoing monitoring and management	• Initiate, titrate, and manage GDMTs, and guide GDMT decision-making • Monitor and support HK management in the context of GDMT • Review electrocardiogram (ECG) findings and assess cardiac risk • Consider early referrals to nephrology when appropriate	• Manage severe chronic HK (if not immediate ED referral) • Provide consultation on mild and moderate cases as needed • Initiate sodium bicarbonate use for acidotic patients • Offer guidance on escalation and complex clinical scenarios (eg, multiple comorbidities, advanced CKD)	• Review medications contributing to HK • Assist with medication adherence and acquisition • Support management of GDMTs, diuretics, and K⁺ binders • Bridge gaps across primary care and specialty care settings

Prepare the Rollout Plan (cont'd)

Extended Care Team Roles & Responsibilities

Dietitians	Care Navigators/ Care Managers	Quality, Population Health, and IT
- Provide patient-specific low-potassium dietary counseling - Support education on food substitutions and long-term lifestyle change	- Assist with follow-up coordination, appointment scheduling, supporting medication adherence and communication across settings - Support patients with education reminders and adherence check-ins	- Support population-level identification of high-risk patients - Monitor pathway adherence and performance metrics - Build and optimize EHR tools (alerts, order sets, care paths)



Engage your stakeholder audiences early in the pre-implementation planning process to ensure they are bought into the implementation aim and proposed rollout plan.

Step 3

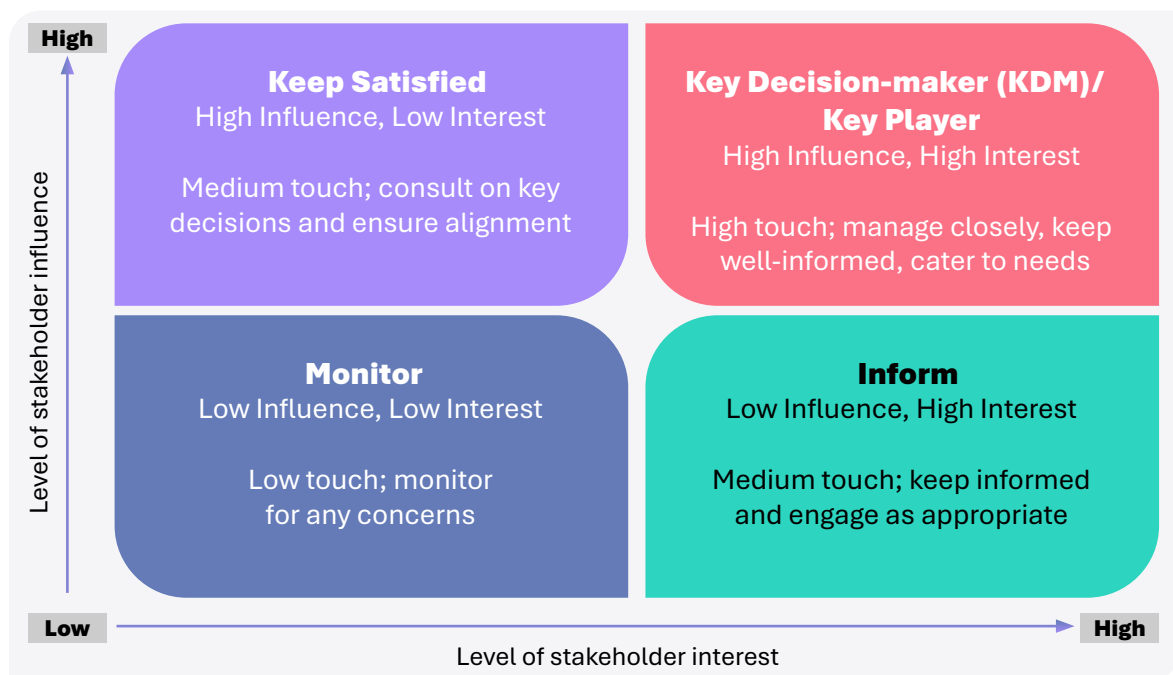
Prepare the Rollout Plan (cont'd)

Extended Care Team Roles & Responsibilities

When considering your stakeholder engagement and management plan, you must consider who will constitute a “key stakeholder” and tailor your communications to your intended audience. To identify stakeholders, consider:

- Who might be interested in this initiative and why?
- Who might be directly impacted and who might be impacted through unintended consequences?

The influence and interest of the stakeholder audience will determine the level of communication needed to execute the rollout plan.



Once you identify your critical stakeholders and what bucket of interest/influence they will fall into, develop your stakeholder engagement plan. Be sure to consider messaging that will resonate with the audience (ie, the WIFM, or “what’s in it for me”), their preferred method/style of communication (eg, data-informed presentation, executive-level bullets, in-person, virtual), and the level of stakeholder buy-in needed (eg, inform of upcoming change vs approve upcoming change). Be sure to anticipate any objections and come prepared with solutions. Additionally, consider any unintended consequences of the intervention (eg, increased referrals to other service lines).

Prepare the Rollout Plan (cont'd)

Stakeholder Engagement & Communications

When approaching your stakeholder audience, consider the engagement approach appropriate for their level of influence/interest in the project, the frequency/modality of your communications, and key messaging. Use the worksheet below to brainstorm. Row 1 includes an example.

Stakeholder Name	Title/Role	Engagement Approach (Manage, Satisfy, Inform, Monitor)	Communication Plan (Messaging/Action Plan, Frequency, Modality)
Jane Doe	Director of Clinical Operation, Primary Care Clinic (Admin)	KDM – Manage closely	Key Messaging: • Patients with CKD and/or HF (when on MRAs/ RAASis) have a substantially higher risk of HK incidence, up to 50% and 39%, respectively.^{9,18} • Patients with HK on average have ~\$15.9K to \$30.3K higher medical costs per year compared to normokalemic patients due to increased ED utilization, admission/readmissions, and longer lengths of stay.¹³ • By implementing a standardized HK care pathway in primary care, we could potentially improve patient safety (eg, mortality rates, adverse effects of uncontrolled HK), avoid downstream costs of care (eg, ED utilization, hospital admission, hospital readmission, unnecessary specialty referral), and improve quality metric performance (eg, 30-day readmission rate in HRRP, MSSP, etc). • This is essential to deliver effective CKM care. Frequency: Monthly updates Modality: Monthly AM huddles; ad hoc email communications, A3 forms, PowerPoint

HRRP, Hospital Readmissions Reduction Program; MSSP, Medicare Shared Savings Program.

Step 3

Prepare the Rollout Plan (cont'd)

Other Sample Stakeholders/Roles for Consideration



Develop a Measurement Plan

Evaluating the success of the Outpatient Hyperkalemia Care Pathway requires selecting measures that reflect your organization’s goals. Because K+ levels can fluctuate quickly and GDMT adjustments have immediate implications for patient safety, consider both process and outcome measures to gauge pathway effectiveness. Process measures help assess consistency in BMP monitoring, repeat-test workflows, and treatment actions, while outcome measures assess the broader clinical impact, such as recurrence rates, ED utilization, and GDMT preservation. A balanced measurement strategy enables systems to demonstrate early wins, identify improvement opportunities, and monitor sustainability.

Step
3

Prepare the Rollout Plan (cont'd)

Sample Metrics to Evaluate the Effectiveness of Intervention

Measure Type	Measure Name	Description	Sample Evaluation Period
Process	Rate of referral to the nephrologist for the initial event of mild to moderate hyperkalemia	Number of patients diagnosed with K+ 5.0-5.9 referred to nephrology in a given time period	Monthly/bimonthly/quarterly
	Rate of referral to the ED	Number of patients diagnosed with HK referred to the ED in a given time period classified by care setting (eg, primary care, outpatient dialysis)	Monthly/bimonthly/quarterly
	E-consult utilization	Number of e-consults completed in a given time period	Monthly/bimonthly/quarterly
	GDMT utilization	Number of patients with a history of HK within 1 year with RAASi or MRAs on their active medication list	Monthly/bimonthly/quarterly
	GDMT adherence	Patient pre- and post-survey results on self-reported adherence to the GDMT regimen	Pre- and post-implementation
	Time from diagnosis to treatment	Time elapsed between diagnosis of hyperkalemia and initiation of K+ binder	Monthly/bimonthly/quarterly
	PCP self-reported confidence in managing patients with hyperkalemia in the originating care setting	PCP pre- and post-survey results on self-reported confidence managing patients with HK in the originating care setting on the Likert scale, from 1 (not at all confident) to 5 (very confident)	Pre- and post-implementation
Outcome	Patients diagnosed with hyperkalemia	Number of patients identified with K+ ≥ 5 mmol/L during a given time period	Monthly/bimonthly/quarterly
	Rate of controlled hyperkalemia	Number of patients diagnosed with HK who subsequently have normal K+ volume in a given time period	Monthly/bimonthly/quarterly
	30-day heart failure admission/readmission rate	30-day, all-cause readmission rate of patients following HF hospitalization	Monthly



Tip

Be sure to get input on meaningful metrics and share your findings with your target audience to reinforce adoption, highlight progress, and guide ongoing improvement.

IMPLEMENTATION



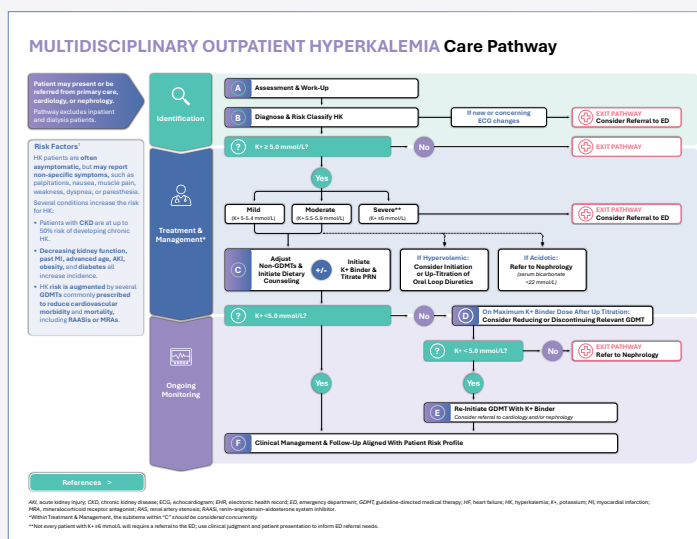
Getting Started

After completing the 4 phases outlined in Preparing for Implementation, integrating the Outpatient Hyperkalemia Care Pathway into practice requires coordinating resources, workflows, and clinical roles into an execution plan.

In this section, you will learn how to:

- ✓ Increase clinician awareness and understanding of hyperkalemia (including risk factors, comorbidities, and referral pathways)
- ✓ Apply a consensus care pathway to identify and manage patients at risk of hyperkalemia
- ✓ Recognize clinical indicators and associated risk factors that warrant monitoring for hyperkalemia
- ✓ Learn appropriate risk classification and associated guidelines for patients with hyperkalemia
- ✓ Through proactive management, develop strategies to maintain GDMTs while treating hyperkalemia

Care Pathway Overview



The consensus Outpatient Hyperkalemia Care Pathway provides a pragmatic, specialty-aligned framework to manage hyperkalemia while maintaining critical GDMTs. The pathway spans 3 phases: identification, treatment and management, and ongoing monitoring.



Assessment & Work-Up

A

Assessment & Work-Up

Overall Assessment²

- Physical examination
- Basic metabolic panel (BMP)
- Patient history: include clinical history of hyperkalemia
- Review of comorbid conditions
- Assessment of cardiac function, kidneys, and urinary tract
- Supplement review
- Dietary review
- Medication review (including adherence review)
- Electrocardiogram (ECG)

Supplement Review³

- Herbal products, potassium supplements

Dietary Review⁴

- Potatoes and derivatives, including fries & chips
- Tomatoes and tomato juice
- Bananas and banana smoothies
- Iced coffee
- Milk
- Salt substitutes

Medication Review^{1,5}

Disease-Modifying Therapeutics for Heart Failure	Other Medication Classes
- Renin Angiotensin Aldosterone System inhibitors (RAASI) such as: - Angiotensin-converting enzyme (ACE) inhibitors - Angiotensin receptor blockers (ARB) - Angiotensin receptor-neprilysin inhibitors (ARNi) - Mineralocorticoid receptor antagonists (MRA) (eg, eplerenone, finerenone) - Beta blockers (eg, metoprolol, atenolol, propranolol) - Sodium-glucose co-transporter 2 (SGLT2) inhibitors (eg, empagliflozin, dapagliflozin)	- Potassium-sparing diuretics (eg, amiloride, triamterene) - Nonsteroidal anti-inflammatory drugs (NSAIDs) (eg, ibuprofen, naproxen sodium, aspirin) - Cyclooxygenase-2 (COX-2) inhibitors (eg, celecoxib, etoricoxib, rofecoxib) - Certain antibiotics (eg, trimethoprim-sulfamethoxazole) - Heparin (eg, enoxaparin, dalteparin)

Next >

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.

B Diagnose & Risk-Classify HK

B

Diagnose & Risk Classify HK

Risk Classification

- A combination of serum potassium and ECG changes are used to risk classify hyperkalemia.^{1,6}
- All-cause mortality significantly increases for every 0.1 mmol/L rise in serum potassium ≥ 5.0 mmol/L.⁷

ECG Features of Hyperkalemia⁶

Serum potassium	Expected ECG abnormality
5.5-6.5 mmol/L	Tall, “peaked” Twaves with narrow base, best seen in precordial leads
6.5-6.0 mmol/L	- Peaked T waves - Prolonged PR interval - Decrease amplitude of P waves - Widening of QRS complex
8.0 mmol/L	- Absence of T wave - Intraventricular blocks, fascicular blocks, bundle branch blocks, QRS axis shift - Progressive widening of QRS resulting in bizarre morphology “Sine wave” patterns (sinoventricular rhythm), VF, asystole

Severe hyperkalemia could be a medical emergency that should prompt consideration of referral to the Emergency Department (ED).

Rule Out Pseudohyperkalemia

- Studies have shown up to an 86.4% incidence of pseudohyperkalemia in repeat potassium tests.⁸
- If the patient is asymptomatic with a normal ECG, pseudohyperkalemia should be suspected.⁹
- After the initial BMP and ECG, **repeat measurement of serum and plasma K+ to rule out pseudohyperkalemia.**⁹
- Use clinical judgment to balance the importance of verification against a potential delay in treatment.*⁹
- If repeat measurement shows serum K+ <5.0 mmol/L, exit the pathway.⁹

Pseudohyperkalemia⁹

Artificially elevated potassium due to:

- Hemolysis during specimen collection
- Thrombocytosis
- Severe leukocytosis
- Prolonged tourniquet application or fist clenching during blood draw
- Delayed sample processing

Next >

B

Consider Referral to the Emergency Department¹

- K+ ≥ 6 mmol/L
- Rapidly rising K+ levels
- Changes in ECG
- Severe AKI
- Advanced CKD
- Adrenal crisis concern
- Acidosis and symptoms
- No safe outpatient follow-up available

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.

C Initiate Potassium Binder

C Adjust Non-GDMTs & Initiate Dietary Counseling¹

Mild Hyperkalemia (K⁺ 5.0-5.4 mmol/L)

As patients with mild hyperkalemia are less urgent, first-line treatment should include:

- Dietary counseling
 - Adjustments to any non-GDMTs (RAASi and/or MRAs) that might contribute to hyperkalemia
- For patients unresponsive to dietary counseling and adjustments to non-GDMTs, K⁺ binder initiation should be considered.

Moderate Hyperkalemia (K⁺ 5.5-5.9 mmol/L)

Moderate hyperkalemia warrants individualized evaluation; however, clinical urgency may necessitate earlier intervention rather than waiting to see if dietary or non-GDMT adjustments are sufficient.

C Initiate Potassium Binder

K⁺ binders are a cornerstone of management of mild and moderate hyperkalemia, especially to preserve Guideline Directed Medical Therapies (GDMTs). K⁺ binder initiation should come before GDMT discontinuation whenever possible.¹

	Veltassa® (Patiromer) ¹⁰	Lokelma® (Sodium Zirconium Cyclosilicate (SZC)) ¹²
Label Information	• Dosage Forms and Strengths: Powder for oral suspension in water: 1 g, 8.4 g, 16.8 g, 25.2 g packets. • Starting Dose: 8.4 g PO 1x daily. • Maintenance Dose: Maintain at 8.4 g daily; adjust the dose at 1-week intervals as needed by 8.4 g daily until K⁺ <5.0 mmol/L. • Time to Onset: 7 hours. • Clinical Trial Primary Endpoint: Within 4 weeks of initiation for the study population with >5.5 mmol/L, mean K⁺ levels fell by -1.23 mmol/L.	• Dosage Forms and Strengths: Powder for oral suspension in water: 5 g or 10 g packets. • Starting Dose: 10 g PO 3x daily for up to 48 hours.* • Maintenance Dose: Maintain at 10 g 1x daily; adjust the dose at 1-week intervals as needed by 5 g daily until K⁺ <5.0 mmol/L. • Time to Onset: 1 hour. • Clinical Trial Primary Endpoint: Within 48 hours of initiation for the study population with >5.5 mmol/L, mean K⁺ levels fell by -1.1 mmol/L. *If on chronic hemodialysis, start at 5 g 1x daily on nondialysis days.
Key Considerations	• Monitor for worsening of gastrointestinal motility and hypomagnesemia. ◦ <i>EMCREG recommends monitoring serum magnesium (Mg) for at least 1 month after initiating and considering Mg supplementation in patients who develop low serum Mg levels (0.58 mmol/L).¹</i> • Administer other oral medications ≥3 hours before or after, except those shown to not have a clinically important interaction. • Clinical trial demonstrated within 4 weeks of initiation, mean K⁺ levels fell by -1.01 mmol/L.	• Monitor for edema, gastrointestinal adverse events in patients with motility disorders, and hypokalemia in patients on hemodialysis. • Administer other oral medications ≥2 hours before or after.
Resources	Access & Savings¹¹	Affordability¹³
Kayexalate® (Sodium Polystyrene Sulfonate (SPS)) ¹⁴	In situations where patiromer or SZC are inaccessible, SPS may be considered for use to manage hyperkalemia. However, due to risk of intestinal necrosis, caution is advised. Dosing can be found here . ¹⁴	

[If hypervolemic >](#)[If acidotic >](#)[Monitoring labs & timing detailed in F >](#)[Next >](#)

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.



Diuretic Considerations

C

Diuretic Considerations

Patients with hyperkalemia commonly require diuretics due to reduced kidney function. In the outpatient setting, oral loop diuretics are prescribed to stimulate diuresis.¹⁵

	Bumex® (bumetanide) ¹⁶	Lasix® (furosemide) ¹⁷	Demadex® (torsemide) ¹⁸
Label Information	Dosage Forms and Strengths: 0.5 mg, 1 mg, or 2 mg tablet Starting Dose: 0.5-10 mg PO - If needed, a second or third dose may be given at 4- to 5-hour intervals up to a maximum daily dose of 10 mg. Maintenance Dose: Intermittent dose schedule; tablets are given on alternate days or for 3-4 days with rest periods of 1-2 days in between.	Dosage Forms and Strengths: 20 mg, 40 mg, or 80 mg tablet Starting Dose: Hypertension (HT): 40 mg PO 2x daily - If needed, add other antihypertensive agents. Edema: 20-80 mg PO 1x daily - If needed, the same dose can be administered 6-8 hours later or the dose may be increased. The dose may be raised by 20 or 40 mg and given not sooner than 6-8 hours after the previous dose until the desired diuretic effect. Maintenance Dose: For edema, individually determined single dose PO 1-2x daily. Safest results dosing on 2-4 consecutive days per week.	Dosage Forms and Strengths: 5 mg, 10 mg, 20 mg, or 100 mg tablet Starting Dose: Congestive Heart Failure (CHF): 10-20 mg PO 1x daily - Chronic Renal Failure (CRF): 20 mg PO 1x daily HT: 5 mg PO 1x daily Maintenance Dose: CHF and CRF: If needed, the dose should be titrated by doubling until the desired response obtained. HT: If the 5 mg dose is not adequate, the dose may be increased to 10 mg once daily after 4-6 weeks. If the 10 mg insufficient, additional antihypertensive agent should be added.
Key Considerations	Bumetanide can be substituted for furosemide at approximately a 1:40 ratio.	- Doses exceeding 80 mg/day for prolonged periods require careful clinical observation. - Furosemide has variable oral bioavailability.	Single doses higher than 200 mg have not been adequately studied.
	- Patients with eGFR <30 mL/min/1.73 m² often require higher or more frequent dosing.¹⁵ - Repeat serum K⁺ measurement within 7 days of initiating diuretics.		

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eGFR, estimated glomerular filtration rate; PO, per os (ie, by mouth).

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.



Metabolic Acidosis Considerations

Metabolic Acidosis Considerations¹⁹

Hyperkalemic Patients Requiring Sodium Bicarbonate (NaHCO₃) for Management of Concurrent Metabolic Acidosis:

- Metabolic acidosis commonly occurs in patients with severe hyperkalemia because the high extracellular potassium disrupts renal ammonia production, causing reduced acid excretion.
- Metabolic acidosis, defined by a reduced serum bicarbonate concentration <22 mol/L, results from acid buildup or excessive bicarbonate loss.

Condition	Sodium Bicarbonate (NaHCO ₃)
Chronic Metabolic Acidosis	Chronic renal failure: 1625-2925 mg/day orally divided every 4-6 hours. - Dose adjustments are based on serum HCO₃ levels. Distal renal tubular acidosis: 48-168 mg/kg/day orally divided every 4-6 hours. - Dose adjustments are based on serum HCO₃ levels. Proximal renal tubular acidosis: 420-840 mg/kg/day orally divided every 4-6 hours. - Dose adjustments are based on serum HCO₃ levels.
Acute Metabolic Acidosis	Initiation: 2-5 mEq/kg/dose IV for a single dose. - Subsequent dosing is based on patient response and acid-base status.
Severe Hyperkalemia (K ⁺ >6 mmol/L)	- The dose needed is empirical and unpredictable. Initiation: 150 mEq of NaHCO₃ can be given in 1 L of 5% dextrose over 4 hours. - More can be provided if acidosis is not corrected with this regimen. If K⁺ must be reduced emergently: 50 mEq of NaHCO₃ IV can be given over 5 minutes.

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IV, intravenous

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.



GDMT Titration Considerations

D & E

GDMT Titration Considerations

Serum K ⁺ Level (mmol/L)	Mild Hyperkalemia (K ⁺ 5.0-5.4)	Moderate Hyperkalemia (K ⁺ 5.5-5.9)
GDMT Management at Time of Hyperkalemic Event ^{1,20}	• Initiate/maintain at the guideline-recommended target dose. ◦ Assess volume status and consider adding/adjusting the diuretic dose. ◦ Reassess serum K⁺ level after 7 days. OR If the patient is not yet at the target dose at the time of the hyperkalemic event: • Consider up-titration to the guideline-recommended target dose depending on the clinical situation.	• Maintain at the guideline-recommended target dose if started. ◦ Assess volume status and consider adding/adjusting the diuretic dose. ◦ Reassess serum K⁺ level after 3-7 days. If K⁺ levels are still high and K⁺ binder is on the maximum dose: • Consider RAAS inhibitor down-titration. If K⁺ <5.0: • Consider up-titration of RAASi if not on the guideline-recommended target dose.
Last Resort GDMT Discontinuation ¹	⚠ Discontinuing GDMTs is a Last Resort. Only Discontinue GDMTs if: • The patient has been prescribed the maximum K⁺ binder dose and K⁺ levels do not reduce within 3-7 days or other labs suggest a more serious renal condition.	
GDMT Reinitiation to Target Dose ¹	Once serum K⁺ <5 mmol/L has been achieved and reversible contributors have been addressed, reintroduce GDMTs. 1. Repeat BMP 3 days after discontinuing GDMTs. 2. When serum K⁺ of < 5 mmol/L is achieved, reinitiate GDMT at the individual FDA label-indicated dose and cadence. 3. Recheck BMP within 7 days. *Refer to nephrology if hyperkalemia is not resolved.	

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FDA, US Food and Drug Administration.

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.

F Clinical Management & Follow-Up Aligned With Patient Risk Profile

F

Clinical Management & Follow-Up Aligned with Patient Risk Profile

Ongoing Monitoring²¹

- Specific K⁺ monitoring frequency is individualized on the basis of hyperkalemia severity, patient comorbidities (eg, CKD, HF, diabetes), medications (eg, RAASi and MRAs), and history of hyperkalemia.

Short-Term Monitoring¹

- Consider repeat BMP within 3-7 days of hyperkalemia resolution, depending on patient severity, to ensure resolution of HK.
- After another 7 days, repeat the BMP.

Long-Term Monitoring¹

- Repeat BMP at 1 month, then repeat BMP every 3 months.
- If a change in electrolyte or volume status is suspected, repeat the BMP monitoring process until a target K⁺ of <5.0 mmol/L is achieved.
- Continue dietary counseling and assess dietary adherence.

Criteria for Re-Entering the Pathway¹:

- Recurrent hyperkalemia - Rapid increases in K⁺	- Metabolic acidosis - Progressive decline in eGFR
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Close >

eGFR, estimated glomerular filtration rate.

This is an image of the care pathway. Reference numbers shown here do not align with those in the implementation guide; please consult the pathway directly for corresponding references.

How to Embed the Pathway Into Your Facility

Health systems vary widely in staffing, EHR infrastructure, and access to specialty and wraparound services. Here are strategies to embed the pathway into your facility and considerations for different practice types.

Relative Access to Resources & Considerations

← Limited Access ————— Broader Access →			
	Private Practice, Community Clinics, or Federally Qualified Health Centers (FQHCs)	Regional Medical Centers or Small to Mid-sized Health Systems	Academic Medical Centers (AMCs), Integrated Delivery Networks (IDNs), or Large Health Systems
Common Characteristics	- Limited specialty access (cardiology/nephrology) - Minimal EHR customization capabilities or IT resources - Reliance on external laboratories	- Moderate EHR functionality and IT support - Some centralized care coordination resources - Partial access to pharmacy or nursing support	- Advanced EHR and analytics capabilities and IT support - On-site specialty care and pharmacy services - Dedicated population health or care navigation teams
Practical Adaptations	- Use printed or static pathway tools (algorithms, checklists, dosing guides) to support decision-making. - Leverage external labs with clear turnaround expectations for repeat K+ testing. - Establish clear referral relationships with cardiology or nephrology for escalation. - Provide patient education handouts focused on diet, medications, and follow-up. - Link to available support resources when appropriate to reduce avoidable admissions/readmissions (eg, community health workers, pharmacists, patient assistance programs).	- Integrate the care pathway into the EHR using alerts or reminders for elevated K+ values and follow-up BMPs. - Use standardized order sets for labs, potassium binders, and referrals. - Leverage centralized nurse or provider follow-up for lab review, patient outreach, and monitoring. - Integrate pharmacists to support binder initiation, titration, and medication review. - Track basic performance metrics (eg, repeat BMP completion, ED referrals). - Provide patient education handouts focused on diet, medications, and follow-up. - Link to available support resources when appropriate to reduce avoidable admissions/readmissions (eg, care managers, home health, pharmacists).	Deploy full clinical decision support (real-time alerts, care gaps, embedded pathway logic). - Use care navigators or population health teams to identify and proactively manage high-risk patients. - Create population-level dashboards to monitor hyperkalemia prevalence, recurrence, GDMT preservation, and ED utilization. - Support continuous pathway optimization through regular data review and governance. - Provide patient education handouts focused on diet, medications, and follow-up. - Link to available support resources when appropriate to reduce avoidable admissions/readmissions (eg, care managers, home health personnel, dietitians, pharmacists).

POST-IMPLEMENTATION

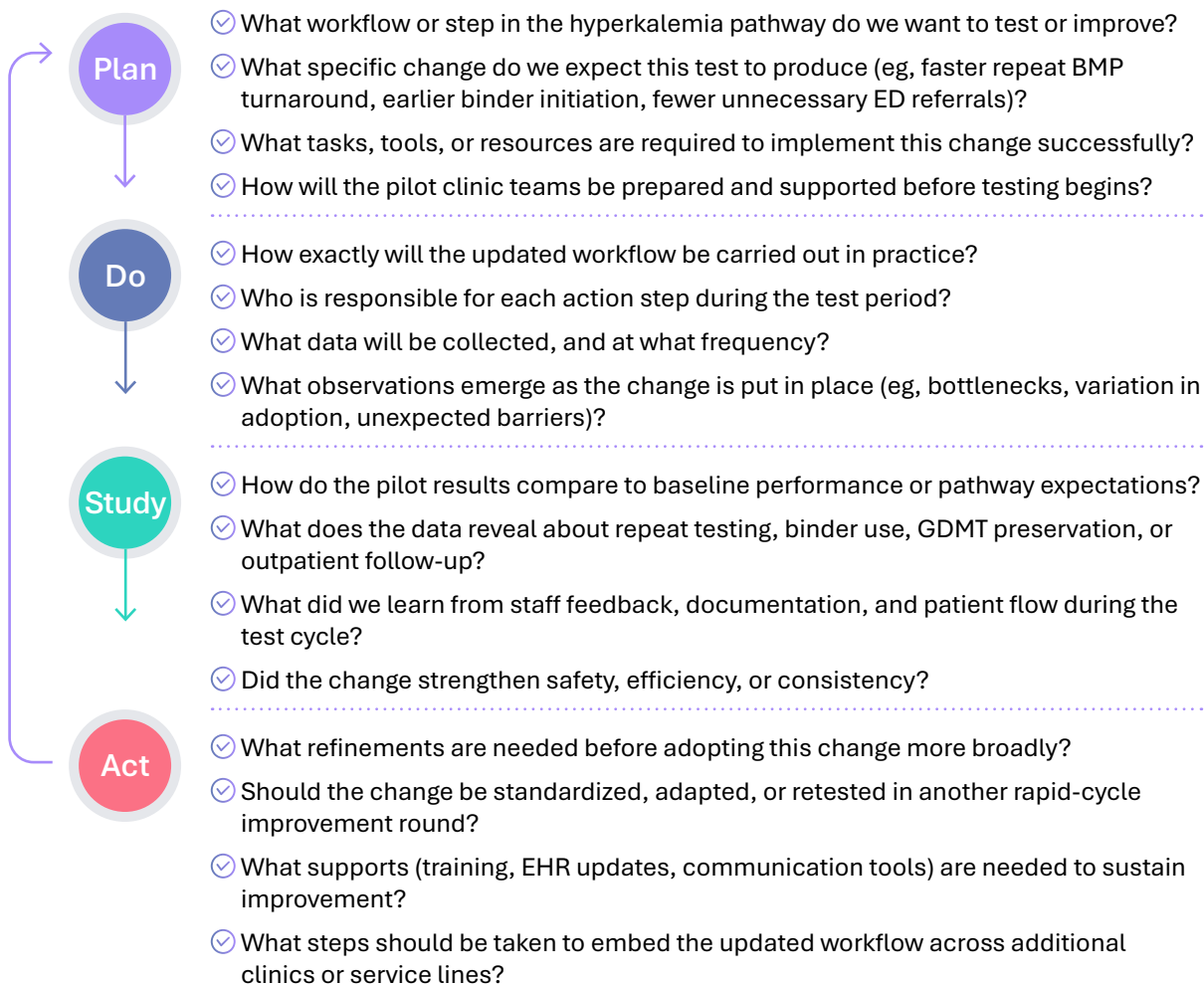
The bottom half of the page features abstract, flowing shapes in various shades of purple and blue. These shapes overlap and curve upwards, creating a modern, organic feel that contrasts with the white background above.

Sustainability & Scalability

Sustaining and scaling the Outpatient Hyperkalemia Care Pathway requires ongoing evaluation, rapid-cycle improvement, and structured governance. As workflows stabilize, teams should continue to refine processes, share outcomes, and prepare for broader adoption across service lines. Establishing a predictable rhythm for review and updating ensures that the pathway remains clinically accurate, operationally feasible, and responsive to new evidence or products.

Using PDSA and Rapid-Cycle Improvement

Applying the Plan–Do–Study–Act (PDSA) model helps organizations test changes on a small scale, evaluate their effect, and refine workflows before broader rollout.



Sustainability & Scalability (cont'd)

Governance and Periodic Pathway Review

Ongoing governance ensures the pathway remains consistent, clinically aligned, and adaptable.

- Establish a **multidisciplinary oversight group** (primary care, cardiology, nephrology, pharmacy, nursing, IT, quality).
- Review pathway performance **quarterly or biannually**, focusing on repeat-test completion, binder use, ED transfers, and GDMT preservation.
- Evaluate whether EHR tools, order sets, or alerts require updates based on clinical experience or new guidance.
- Use pathway review meetings to remove barriers, refine referral criteria, and reinforce accountability.

Continued Training Cycles

Training should not end after initial implementation.

- Provide **annual refreshers** on hyperkalemia identification, ECG interpretation, binder use, and GDMT preservation.
- Update staff on any workflow changes, new evidence, or new potassium-lowering therapies.
- Reinforce pathway expectations during onboarding of new clinicians, APPs, and pharmacists.
- Use case reviews to highlight best practices and promote adherence.

Updating Based on New Evidence and Products

Hyperkalemia management evolves as new therapies, guidelines, and digital tools emerge.

- Review updates from KDIGO, AHA/HFSA, and major clinical trials to maintain pathway accuracy.
- Incorporate new binders, updated dosing guidance, or revised risk-stratification criteria as evidence evolves.
- Adapt EHR decision support to reflect emerging best practices.
- Document changes in a version-controlled pathway file to ensure systemwide consistency.

Acronyms: AHA, American Heart Association; HFSA, Heart Failure Society of America; KDIGO, Kidney Disease: Improving Global Outcomes

CONCLUSION



Conclusion

Thank you for reviewing the Hyperkalemia Care Pathway Implementation Guide and for your commitment to advancing care delivery for patients with hyperkalemia. By standardizing workflows across primary care, cardiology, and nephrology, organizations can reduce clinical variation, prevent unnecessary ED utilization, and support consistent, proactive management of patients at elevated cardiometabolic risk.

Successful implementation requires alignment across clinical, operational, and digital teams. When integrated effectively into existing workflows and EHR systems, the pathway enables earlier intervention, more efficient follow-up, and improved continuity of care, ultimately supporting better patient outcomes. If you have any questions or are seeking additional information, please reach out to Kristi Cohn AVP, Care Delivery (kristi.cohn@petauri.com).

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APPENDIX



Additional Resources/Appendix

Organizations Pioneering Hyperkalemia Research



American Heart Association (AHA)



American College of Cardiology (ACC)



Heart Failure Society of America (HFSA)



Kidney Disease: Improving Global Outcomes (KDIGO)

Foundational Hyperkalemia Studies

- ✓ [Utilization of Potassium Binders for the Management of Hyperkalemia in Chronic Kidney Disease: A Position Statement by US Nephrologists](#)
- ✓ [Consensus on the management of hyperkalemia in patients with heart failure: Recommendations from the SEC-SEMI](#)
- ✓ [Can We Stop Reflexively Discontinuing Mineralocorticoid Antagonists for Patients With Heart Failure and Hyperkalemia?](#)
- ✓ [EMCREG-International Multidisciplinary Consensus Panel on Management of Hyperkalemia in Chronic Kidney Disease and Heart Failure](#)
- ✓ [Interdisciplinary recommendations for recurrent hyperkalaemia: insights from the GUARDIAN-HK European Steering Committee](#)
- ✓ [An international Delphi consensus regarding best practice recommendations for hyperkalaemia across the cardiorenal spectrum](#)
- ✓ [Patiomer for the management of hyperkalemia in heart failure with reduced ejection fraction: the DIAMOND trial](#)
- ✓ [Sodium Zirconium Cyclosilicate in HFrEF and Hyperkalemia: REALIZE-K Design and Baseline Characteristics](#)