

# Lab Work Follow-up Process And Timelines (Adults)

## Section 1: Initiating Screening/Follow-Up of Out-of-Range Lab Results for Adults

### Process Steps:

1	Check if there are multiple out-of-range lab values (e.g., high potassium; low bicarbonate; significant increase in creatinine).
2	Check if the out-of-range value(s) is consistent with previous values. i.e., known, pre-existing out-of-range value vs a new finding. <ul style="list-style-type: none"> <li>If out-of-range value(s) is consistent with previous values, has the patient received the relevant information/teaching? <ul style="list-style-type: none"> <li>If NO, follow-up is required.</li> <li>If YES, follow-up may not be required.</li> </ul> </li> </ul>
3	Check when the patient is scheduled for their next appointment. <ul style="list-style-type: none"> <li>For example, if the initiation of follow-up/screening window is “within 1 week”- (see suggested timeframes), consider holding off until the next appointment if the appointment is soon.</li> </ul>
4	Decide within the team who will do the initial screening/follow-up with the patient. Whenever possible, limit to one KCC team member.
5	Contact patient for the initial screening/follow-up. Refer to Sections 2 & 3 for guidance on information to collect during the initial screening/follow-up.
6	Based on screening/follow-up findings, involve other KCC team members, as appropriate (e.g., nephrologist, dietitian, pharmacist, etc).

### Suggested Timeframes:

Test	Normal		Initial Screening/Follow-up Timelines (upon identification of out-of-range value) <sup>a</sup>			
			Lab will Call MD (Alert/Critical)	By Next Business Day	Within 1 Week <sup>Note 1</sup>	Next Appt (not urgent) <sup>Note 2</sup>
Creatinine (umol/L)	F: 45 – 90 M: 45 - 110	High		↑>35%	↑20% - 34%	↑<20%
Potassium (mmol/L) <sup>a</sup>	3.5 – 5.0	Low	< 2.8	2.8 – 3.0	3.1 – 3.2	3.3 – 3.4
		High	> 6.2	6.0 – 6.2	5.7 – 5.9	5.1 – 5.6
Sodium (mmol/L)	135 – 145	Low	< 120	120 – 125	126 – 130	131 – 134
		High	> 160	150 – 160	146 – 149	
Phosphorus (mmol/L)	0.80 – 1.50	Low	< 0.32	n/a	n/a	All values except critical
		High	n/a	n/a	n/a	All values
Bicarbonate <sup>a</sup>	20 – 30	Low	< 10	10 – 16	n/a	17 – 19
		High	> 40	n/a	n/a	31 – 40
Ionized calcium (mmol/L)	1.15 – 1.40	Low	< 0.80	0.80 – 0.90	0.91 – 1.00	1.01 – 1.14
		High	> 1.61	1.50 – 1.60	1.41 – 1.49	n/a
Total calcium (mmol/L)	2.10 – 2.60	Low	< 1.50	1.50 – 1.80	1.81 – 1.99	2.00 – 2.09
		High	> 3.25	2.90 – 3.25	2.70 – 2.89	2.61 – 2.69
If on anemia protocol or on ESA, see Note 3.						
If not on anemia protocol (ESA), hemoglobin (g/L)	F: 115 – 155 M: 135 – 170	Low	< 60	60 – 84 or ↓15 or more	85 – 90	F: 91 – 114 M: 91 – 134
If not on anemia protocol (ESA), serum ferritin, iron, TIBC, iron saturation					TSAT < 0.10	All other cases

<sup>a</sup> Any team member may contact patients earlier than the guideline suggests when significant changes in potassium or bicarbonate occur, as large shifts in potassium (e.g., 3.9 to 5.9) require more urgent follow-up—see full guideline for details. In any situation where the clinician is concerned, please feel free to contact sooner.

Non-critical out-of-range values which can generally be left until the next appointment (not urgent):

- Chloride
- Hematology profile (CBC) other than hemoglobin
- Albumin/creatinine ratio (ACR) if available; if not, urine protein/creatinine ratio (PCR)
- Albumin
- Hemoglobin A1c
- Parathyroid hormone intact (iPTH)

#### Note 1:

Consider holding off follow-up until the next appointment if the next appointment is less than 4 weeks away.

#### Note 2:

Flag results for the nephrologist to review at the patient's next appointment. If clinically indicated and/or KCC staff member is concerned, contact the nephrologist sooner.

#### Note 3:

Refer to CKD Non-Dialysis Anemia Management Protocol for assessment, actions and timelines.

## Section 2: Screening/Initial Follow-up of Out-of-Range Results (all out-of-range values)

1	<b>Illnesses &amp; procedures</b>	<ul style="list-style-type: none"> <li>Do you have any new health problems, or have you been to hospital since we last saw you?</li> <li>Have you had any procedures or recent imaging?</li> <li>Have you been ill? (e.g., vomiting, diarrhea, fever)</li> </ul>
2	<b>Eating &amp; drinking</b>	Have you been eating and drinking as usual? (e.g., changes to your diet, staying hydrated, fasting prior to the lab test).
3	<b>Medications &amp; supplements</b>	<ul style="list-style-type: none"> <li>What medications/supplements are you currently taking? (compare with prescribed medications and, if accessible, compare with PharmaNet)</li> <li>Have you started any new medications/supplements, stopped any previous ones or had any changed? (e.g., ACEi, ARB, diuretic, NSAIDs, antibiotics)</li> </ul>
4	<b>Symptoms</b>	<ul style="list-style-type: none"> <li>Are you experiencing any of the symptoms listed in section 3? If so, when did it start to bother you? How severe is it? Is it improving or getting worse?</li> </ul>

**Note:** There may be little correlation between reported symptoms and out-of-range lab values.

## Section 3: Potential Symptoms Associated with Significantly Out-of-Range Values & Questions Relevant for Initial Follow-Up/Screening

Value	Value	Potential Symptoms	Examples of Questions to Assess for Potential Causes of Lab Abnormality <sup>b</sup>
Creatinine	High	<ul style="list-style-type: none"> <li>Urinating less or more, passing bloody or foamy urine</li> <li>Swelling in feet, ankles or face</li> <li>Nausea and vomiting or diarrhea</li> <li>Other: High BP, muscle cramps, chest pain, confusion, SOB</li> </ul>	<ul style="list-style-type: none"> <li>Have you noticed changes in your voiding habits? (e.g., difficulty voiding, pain).</li> </ul>
Potassium  Refer to Appendix 2 in lab work guideline for factors influencing potassium levels	High	<ul style="list-style-type: none"> <li>Muscle weakness, tingling, numbness</li> <li>Severe: chest pain, heart palpitations, SOB</li> <li>Nausea and vomiting</li> </ul>	<ul style="list-style-type: none"> <li>Were you prescribed a potassium binder? If so, are you taking it as prescribed?</li> <li>Are you prescribed any medication that can increase potassium level (potassium supplement, ACEis, ARBs, MRA), or any dosage change for these medications?</li> <li>Where did you have your labs drawn? (If accuracy of test is in doubt, repeat at hospital lab as per nephrologist's order)</li> <li>High potassium levels can be due to high blood sugars. Do you have diabetes? If so, how are your blood sugars?</li> <li>Constipation can cause high potassium levels. Have you had any issues with constipation?</li> </ul>
	Low	<ul style="list-style-type: none"> <li>Heart palpitations</li> <li>Muscle weakness and spasms</li> <li>Tingling and numbness</li> </ul>	<ul style="list-style-type: none"> <li>Certain water pills (thiazide/loop diuretics) can cause low potassium levels. Are you taking a water pill?</li> <li>Were you prescribed a potassium binder? If so, are you taking it as prescribed?</li> <li>Were you prescribed a potassium supplement? If so, are you taking it as prescribed?</li> </ul>
Sodium	High	<ul style="list-style-type: none"> <li>Excessive thirst</li> <li>Decreased energy, lethargy</li> <li>Urinating very little or lots of dilute urine</li> <li>Vomiting</li> </ul>	<ul style="list-style-type: none"> <li>High sodium levels can be due to dehydration. <ul style="list-style-type: none"> <li>Are you dehydrated and have you experienced vomiting or diarrhea, which could lead to dehydration?</li> <li>Are you taking a water pill?</li> <li>How much fluid are you drinking daily?</li> </ul> </li> </ul>

continued

Value	Value	Potential Symptoms	Examples of Questions to Assess for Potential Causes of Lab Abnormality <sup>b</sup>
Sodium	Low	<ul style="list-style-type: none"> <li>Confusion</li> <li>Nausea and vomiting</li> <li>Headache</li> <li>Restlessness and irritability</li> <li>Muscle weakness, spasms or cramps</li> </ul>	<ul style="list-style-type: none"> <li>Low sodium levels can be due to too much fluid in your body.</li> <li>Any change in your swelling or body weight?</li> <li>How much fluid are you drinking daily?</li> <li>Certain water pills (thiazide diuretics, amiloride) can cause low sodium levels. Are you taking any water pills?</li> </ul>
Bicarbonate	High	<ul style="list-style-type: none"> <li>Confusion</li> <li>Muscle twitching/cramps</li> <li>Tingling and numbness</li> <li>Abnormal heart rhythm</li> <li>Seizures</li> </ul>	<ul style="list-style-type: none"> <li>Certain water pills (thiazide/loop diuretics) can cause high bicarbonate levels. Are you taking a water pill?</li> </ul>
	Low	<ul style="list-style-type: none"> <li>Rapid and deep breathing</li> <li>Fast heart rate</li> <li>Confusion or dizziness</li> <li>Nausea and vomiting</li> </ul>	<ul style="list-style-type: none"> <li>Were you prescribed sodium bicarbonate? If so, are you taking it as prescribed?</li> <li>Poorly controlled blood sugars can cause a condition called diabetic ketoacidosis, leading to low bicarbonate levels. <ul style="list-style-type: none"> <li>Do you have diabetes? If so, how are your blood sugars?</li> </ul> </li> <li>Metformin can cause a condition called lactic acidosis, leading to low bicarbonate levels. Are you taking metformin?</li> </ul>
Phosphorus	Low	<ul style="list-style-type: none"> <li>Muscle weakness</li> <li>Confusion, irritability</li> <li>Respiratory or heart failure</li> </ul>	<ul style="list-style-type: none"> <li>Are you eating less than before?</li> </ul>
Calcium	High	<ul style="list-style-type: none"> <li>Nausea, vomiting, constipation, stomach pain</li> <li>Bone pain, muscle weakness</li> <li>Confusion, difficulty thinking</li> <li>Increased thirst or frequent urination</li> </ul>	<ul style="list-style-type: none"> <li>Were you prescribed any calcium or vitamin D supplements? If so, are you taking them as prescribed?</li> <li>Are you taking any extra supplements? Do they contain calcium or vitamin D?</li> <li>Dehydration can be both a cause and symptom of high calcium levels. <ul style="list-style-type: none"> <li>Are you drinking less fluid than usual?</li> <li>Are you dehydrated or have you experienced vomiting or diarrhea, which can cause dehydration?</li> </ul> </li> <li>Are you feeling thirstier or urinating more than usual? If so, do you have diabetes, and how are your blood sugars?</li> <li>Certain water pills (thiazide diuretics) can cause high calcium levels. Are you taking any water pills?</li> </ul>
	Low	<ul style="list-style-type: none"> <li>Muscle cramps, spasms or stiffness</li> <li>Tingling in the lips, tongue, fingers and toes</li> <li>Dry, scaly skin, coarse hair and brittle nails</li> <li>Irregular heartbeat or heart failure</li> </ul>	<ul style="list-style-type: none"> <li>Were you prescribed or taking any calcium or vitamin D supplements? Are you taking them as per previous or as prescribed?</li> <li>Certain osteoporosis medications (bisphosphonates, denosumab) can cause low calcium levels. Are you taking any osteoporosis medications?</li> </ul>
Hemoglobin, iron studies	Low	<ul style="list-style-type: none"> <li>SOB</li> <li>Pale skin</li> <li>Weakness</li> <li>Dizziness</li> </ul>	<ul style="list-style-type: none"> <li>For low hemoglobin: Were you prescribed an ESA (darbepoetin alfa or epoetin alfa)? If so, are you taking as prescribed?</li> <li>Were you prescribed iron supplements? If so, are you taking as prescribed?</li> <li>Have you noticed unusual bleeding (e.g., change in stool colour, recent surgery)?</li> </ul>

<sup>b</sup> These questions are in addition to the initial questions asked to assess any out-of-range lab result (i.e., recent illnesses & procedures and changes in eating & drinking and medications & supplements).