

Provincial Adult Iron Deficiency Anemia Primary Care Clinical Pathway

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This pathway should be used for **adults with Iron Deficiency Anemia (IDA)**. Use it for guidance on diagnosis and management in patients with clinical suspicion of iron deficiency anemia when: **Male:** Hgb <135 g/L, **Female:** Hgb <120 g/L

This pathway does not provide guidance for anemia in pregnancy OR perioperative anemia

Click here [Obstetrical screening and treatment algorithm](#); [Peri-operative iron therapy](#)

1. Assess

Symptoms (if not already done):

fatigue, syncope, chest pain, tachycardia, hypotension, restless leg syndrome, pallor

2. Red Flags

- Assessment indicates ongoing GI blood loss
- Active acute bleeding (GI, GU, Epistaxis)
- Underlying CAD with recent instability
- Hgb <60g/L
- Significant symptoms of hemodynamic instability

[Iron Deficiency Anemia \(IDA\) Pathway for Colorectal Cancer Diagnosis](#)

Refer to RAAPID or Emergency or urgent care facility

No red flags

3a. Diagnosis of iron deficiency:

- ferritin <30ug/L OR
- ferritin <100ug/L + TSAT < 0.20 with chronic kidney disease or known inflammatory condition

Consider other types of anemia (including mixed anemias) [see expanded details for work up](#)

3b. Investigate underlying causes: consider blood loss, poor intake, poor absorption

IDA requires management regardless of cause

4a. Treatment Options

In most cases, **oral iron therapy is first line therapy**. Regimens should be patient-specific and based on tolerability.

- IV Iron therapy should be used when there is:
 - Intolerance of oral therapy
 - Inadequate response to oral iron
 - Malabsorption conditions
 - Urgent Need

Special populations

TIP: All patients with low ferritin should receive iron supplementation even if Hgb is within normal range

NOTE: Unless contraindicated, patients benefit from oral iron supplementation while waiting for IV iron infusions.

4b. Supplementation

Has patient tried oral iron therapy as well as optimized dietary intake?

Yes

- Methods tried to improve absorption or tolerance unsuccessful
- Has tried at least 2 formulations of oral iron
- Does Hgb continue to decline?

Yes

IV Iron Therapy

Consider - indication, medication choice, dose and regimen, and location of infusion. See expanded details for guidance

[Ordering IV Iron](#)

No

Trial oral iron supplement starting with:

- 100-200 mg of elemental iron daily or every other day. Take with vitamin C; many find night use easiest. Best absorbed on empty stomach (only if tolerated)

No

[Oral Iron Optimization](#)

Perform:

- Ferritin and Hgb after 3 months
- Consider checking CBC within 2-4 weeks to monitor for initial response depending on severity of anemia.
- Is there adequate response to oral therapy? See page 2 of [Oral Iron Optimization](#) (green box)

No Yes

Continue iron supplements for at least 3-6 months after achieving normal hemoglobin, target normal ferritin

5. If IDA recurs with no obvious cause - re-investigate and/or refer for further assessment

- Maximum hemoglobin response to IV iron occurs 4-6 weeks after the last dose.
- Consider if ongoing oral supplementation indicated



This pathway is intended for healthcare providers and focuses on the care and management of patients where there is clinical suspicion of iron deficiency anemia. This primary care pathway was co-designed provincially by Primary Care Providers, Specialist Physicians (Hematologists), Patient and Family Advisors, and the Provincial Pathways Unit. The information presented is based on current evidence from reputable sources, including Alberta healthcare professionals, peer-reviewed journals, current clinical guidelines, and specialty care recommendations. It is designed to support clinical decision-making but should not replace the professional judgment of a qualified healthcare provider. This resource does not account for the unique circumstances of individual patients. Providers should always apply their clinical expertise and consider patient-specific factors when delivering care.

EXPANDED DETAILS

Pathway Primer

- Anemia is a common finding in primary care. Iron deficiency anemia (IDA) is the most common cause of anemia, with prevalence as high as one in five menstruating women [1,2]. Iron deficiency is the leading nutritional deficiency worldwide and is responsible for roughly half of all anemia cases [2].
- Iron deficiency may occur with or without anemia. Anemia usually appears later in the trajectory of iron deficiency [1]. Although definitions vary, ferritin levels below approximately 30 µg/L in most adults indicates iron deficiency anemia.
- The accurate diagnosis of IDA is contingent on ordering and interpreting the appropriate blood indices: hemoglobin, ferritin, and/or iron binding defined as transferrin saturation. It is important to consider that anemia may be mixed.
- When IDA is identified, a rigorous evaluation of etiology should be undertaken. While etiology may be evident on history (e.g. heavy menstrual blood loss or a history of frequent blood donation), consideration should be given to all conditions which could cause blood loss or reduced iron absorption.
- If patients are anemic and iron deficient with no obvious cause, they should undergo gastrointestinal evaluation, including endoscopy, to investigate potential sources of blood loss. See [Iron Deficiency Anemia \(IDA\) Pathway for Colorectal Cancer Diagnosis](#).
- While investigating IDA and managing the antecedent cause, consideration should be given to iron supplementation. Generally, this is best accomplished through oral iron supplementation. This guide will provide practical guidance for oral iron replacement, which can be limited by GI tolerability or urgency of iron replacement.
- Intravenous iron is particularly helpful in select situations, although its use is limited by access to administration. This document will address indications for IV iron and pathways to help you facilitate getting this therapy for appropriate patients.

1. Assessment

Iron deficiency may occur with or without anemia. Although definitions vary, ferritin levels below approximately 30 µg/L in most adults indicate iron deficiency.

Assess the patient for the following symptoms:

- Fatigue
- Syncope
- Chest pain
- Tachycardia and hypotension
- Pallor
- Restless leg syndrome

2. Red Flags

It is important to rule out GI blood loss as the cause of anemia. Review this pathway: [Iron Deficiency Anemia \(IDA\) Pathway for Colorectal Cancer Diagnosis](#).

Low hemoglobin can be a significant risk and may go undetected for some time before a patient becomes symptomatic. Patients with acute anemia may present with clinical features of hemorrhagic shock. The condition is especially concerning in the context of active bleeding or underlying coronary artery disease. In these settings, reduced oxygen-carrying capacity can precipitate myocardial ischemia and rapid hemodynamic decompensation. Effective management requires prompt recognition, accurate determination of the etiology, and timely initiation of resuscitative and supportive measures to restore adequate tissue perfusion and prevent serious complications [7].

Refer patients to Emergency Department, Urgent Care Facility or call [RAAPID](#) for:

- Active acute bleeding (e.g., GI, GU, or epistaxis)
- Underlying CAD with recent instability
- Hgb <60d/L (<80g/L in pregnancy)
- Signs of hemorrhagic shock (tachycardia, hypotension, pallor, and altered level of consciousness)

3a. Diagnosis of iron deficiency

- In most cases, IDA can be diagnosed based on a low hemoglobin (Male: Hgb <135 g/L, Female: Hgb <120 g/L, **AND** a ferritin of <30ug/L.
- Ferritin is an acute phase reactant, therefore, in patients with inflammatory conditions or chronic kidney disease (CKD), a ferritin <100 may be consistent with iron deficiency. For patients with microcytic anemia **AND** a known inflammatory condition or CKD, suspect IDA if:
 - Ferritin <100 ug/L and TSAT <0.20.

Diagnosis of other types of anemia:

- IDA can coexist with other types of anemia. This is called mixed anemia and though the patient is iron deficient, the anemia may appear normocytic or macrocytic. Consider evaluating for other types of anemia based on relevant patient history.
- When clinically indicated, order tests to further diagnose mixed anemias and refer to other clinical pathways or specialties as needed.

Tests to consider - base ordering on MCV Classification

Microcytic Anemia (MCV<80)	Normocytic Anemia (MCV 80-100)	Macrocytic Anemia (MCV>100)
<ul style="list-style-type: none"> • Iron indices: Iron, TIBC, TSAT • Screen for thalassemia (hemoglobin electrophoresis) if ferritin >100 ug/L and no known inflammatory conditions 	<p>New anemia or cause unknown:</p> <ul style="list-style-type: none"> • Iron indices: Iron, TIBC, Iron saturation index • LDH, Haptoglobin • AST, ALT, ALP, INR, Total Bilirubin • CBC w/ differential, reticulocytes, Peripheral blood smear • Creatinine and Vit B12 • Serum Protein Electrophoresis (SPEP) and Free light chains (FLC) should be considered in patients age >50 <p>Consider repeat testing annually if cause of IDA remains unknown perform-</p> <p>Iron indices: Iron, TIBC, Iron saturation index, ferritin, and CBC</p>	<ul style="list-style-type: none"> • Iron indices: Iron, TIBC, Iron saturation index, ferritin • LDH, Haptoglobin • AST, ALT, ALP, INR, Total Bilirubin • CBC w/ differential, reticulocytes, Peripheral blood smear • Creatinine and Vit B12 • SPEP and FLC should be considered in patients age >50

Causes of anemia divided by MCV classification

Microcytic anemia MCV <80	Normocytic anemia MCV 80-100	Macrocytic anemia MCV >100
<ul style="list-style-type: none"> Commonly caused by iron deficiency, and can also be caused by thalassemia*, anemia of chronic disease, and rarely sideroblastic anemia or lead poisoning. <p>*Thalassemias are the next most common cause of low MCV, and a characteristic pattern is an MCV that is persistently low with little variation in the size of the cells, meaning a normal RDW. In the event of a persistently low MCV with ferritin >100, a screen for thalassemia can be sent [8].</p>	<ul style="list-style-type: none"> Common condition and not necessarily reflective of sinister pathology. Causes of normochromic normocytic anemia: age-associated reduced bone marrow activity, medication-related bone marrow activity, infection, malignancy, chronic kidney disease (CKD), heart failure, obesity, chronic inflammatory conditions (rheumatoid arthritis, systemic lupus erythematosus, vasculitis etc.) Mixed anemias which may <i>appear</i> as normocytic When evaluating the onset of 'new' normochromic, normocytic anemia, consider that the laboratory picture could be reflective of 'mixed' anemias (e.g., very recent blood loss, mixed iron/B12 deficiency) Negative investigations should reassure that CBC can be followed on a yearly basis. 	<ul style="list-style-type: none"> Common causes include [10]: <ul style="list-style-type: none"> liver disease, alcohol consumption, B12 deficiency, folate deficiency, reticulocytosis, thyroid disease, bone marrow disorders (e.g., myelodysplasia in older adults), and medications, such as methotrexate, hydroxyurea, valproate, phenytoin, azathioprine, and antiretroviral therapy.

3b. Investigate Underlying Causes

There are several common causes of iron deficiency [9]:

- Blood loss: menorrhagia, GI losses, severe epistaxis, frequent blood donation
- Poor intake: malnourishment, strict vegan/vegetarian, eating disorder
- Poor absorption: celiac, inflammatory bowel disease, post GI surgery, pernicious anemia

Review causes of iron deficiency

Intake/Absorption	Sequestration
<ul style="list-style-type: none"> • Dietary restriction (e.g., vegan) • Antacid/proton pump inhibitor (PPI) meds • Malabsorption/celiac: Provincial Celiac Disease Primary Care Pathway • Gut resection • Gastroesophageal reflux disease/gastritis (including atrophic gastritis, particularly in the elderly): Provincial Gastroesophageal Reflux Disease Primary Care Pathway 	<ul style="list-style-type: none"> • Inflammatory diseases • Congestive heart failure • CKD • Obesity • Iron refractory IDA (congenital, rare)
Physiologic State	Blood Loss
<ul style="list-style-type: none"> • Extreme exercise • Eating disorder • Pregnancy Obstetrical screening and treatment algorithm 	<ul style="list-style-type: none"> • Gastrointestinal <ul style="list-style-type: none"> ◦ Iron Deficiency Anemia (IDA) Pathway for Colorectal Cancer Diagnosis • Genitourinary <ul style="list-style-type: none"> ◦ Provincial Bladder Cancer Diagnosis Primary Care Pathway • Gynecological <ul style="list-style-type: none"> ◦ Provincial Adult Abnormal Uterine Bleeding Primary Care Clinical Pathway ◦ Post-Menopausal Bleeding Primary Care Clinical Pathway ◦ Provincial Perimenopause and Menopause Primary Care Clinical Pathway • Epistaxis • Iatrogenic • Blood donation

(Note: If the pathway links are broken go to: [Alberta's Pathway Hub | Alberta Health Services](#))

See [Referral Information](#) section for information on referrals to specialty care

4a. Treatment Options

The goal of iron supplementation is to restore iron stores and normalize hemoglobin and ferritin levels. The target of therapy is a normal ferritin level and a normal or stable hemoglobin. Iron replacement should be initiated promptly once iron deficiency is identified, regardless of whether anemia is present. Management should be individualized based on the underlying cause of iron deficiency. Even when an apparent cause is identified, iron deficiency is often multifactorial and warrants a comprehensive assessment. [18].

NOTE: In microcytic anemia, iron supplementation should not be started until iron deficiency is confirmed with ferritin testing. A low MCV with normal ferritin may suggest hemoglobinopathy (e.g., thalassemia), prolonged iron therapy in these patients may be harmful.

Iron Supplementation: Oral and/or Intravenous

It is important to treat the underlying cause as well as start iron supplementation. **Oral iron supplementation should be tried first in most cases.** Intravenous iron infusions should be used in the following scenarios:

- Intolerance to oral iron despite trials of multiple formulations, including heme iron or polysaccharide iron preparations
- Hemoglobin continues to decline while on oral iron therapy
- Inadequate response to oral iron, despite optimization strategies
- Malabsorption: clinical conditions prevent the intestine from absorbing oral iron (e.g., severe inflammatory bowel disease or post-gastric bypass surgery).
- Urgent Need: A rapid increase in iron levels is required, such as before a high-risk surgery

Special populations

- [Iron therapy and congestive heart failure backgrounder](#)
- [Iron therapy in inflammatory bowel diseases](#)
- [Iron therapy and restless leg syndrome](#)
- [Peri-operative iron therapy](#)
- [Alberta Obstetric Anemia and Iron Deficiency Screening and Treatment Algorithm](#)
- **Chronic Kidney Disease:** Patients may receive IV iron to maintain ferritin levels at or above 100 ng/mL and transferrin saturation at or above 20%.

IV iron is contraindicated when:

- Hypersensitivity to iron sucrose or excipients.
- There is evidence of iron overload.
- Anemia is not caused by iron deficiency.

Note: unless a patient is hemodynamically unstable, most patients do not require blood transfusion and benefit from IV Iron infusion.

4b. Supplementation

Dietary Iron Intake

- Encourage adequate dietary iron intake in all patients to prevent and manage iron deficiency.
- Iron intake goals should be individualized based on recommended daily requirements, considering: sex, age, pregnancy status, and dietary pattern.
- Consider referral to a registered dietitian as clinically indicated. Patients may also access dietitian support by calling 811 (Health Link).
- See [Iron and Your Health](#) for a patient resource with recommended mg amounts of iron and tips for increasing oral absorption.

Oral iron therapy

See [Iron dosing and administration in adults](#):

- Start with 100-200 mg every day or every other day. Take with vitamin C on an empty stomach if tolerated. Many find taking oral iron at night easiest.
- Oral iron tolerability strategies include: using a low starting dose and using an intermittent (every other day) dosing schedule.
- Patients who do not respond to or tolerate initial form of oral therapy may respond to a different formulation. Dose increase may not translate to improved outcome.
- For more guidance on oral iron options, refer to [Oral Iron Optimization](#).

Treatment monitoring

- Follow-up monitoring should be individualized based on anemia severity, etiology of iron deficiency, and clinical impact. For patients with moderate to severe anemia (Hgb <90), repeat a CBC within 2–4 weeks. Hemoglobin should start to improve within 4 weeks and plateau at 3 months. Complete repletion of iron stores may take up to 6 months.
- With appropriate iron dosing and correction of the underlying cause, hemoglobin typically normalizes within 2–4 months.
- After hemoglobin normalization, continue iron therapy for an additional 4–6 months in adults to restore iron stores. Re-check ferritin 3–6 months after hemoglobin normalization in both anemic and non-anemic patients. Target ferritin in normal range.
- If hemoglobin or ferritin fail to respond as expected, reassess adherence, ongoing blood loss, malabsorption, or alternative diagnoses.

IV Iron Therapy

Before initiating IV Iron Therapy, consider the following:

Indication

Indication and drug coverage for IV iron will determine where the infusion can take place. Refer to local practices.

Drug type

- Iron sucrose (Venofer) and sodium ferric gluconate (Ferrlecit):
 - Can be infused at AHS facilities.
 - No cost for visit or medication.
 - Completed over multiple visits. Local variations exist.
- Ferric carboxymaltose (Ferinject) and iron isomaltoside 1000 (Monoferric):
 - Requires special authorization form: [IV IRON ALBERTA BLUE CROSS SPECIAL AUTH FORM](#).
 - Patient needs to get drug from own pharmacy and bring medication to infusion center.
 - This treatment is generally completed in one visit.

Dose and Regimens

- See page 2 of [Iron dosing and administration in adults backgrounder](#) for IV iron dosing.

Locations

IV Iron is available in Day Medicine/Day Treatment/Parenteral therapy departments in most hospitals in Alberta. Follow local practices and guidelines:

- Check the [Alberta Referral Directory - Main Search](#)
 - Search: "IV iron."
 - Results are zone dependent.
 - Acceptance is dependent on availability and reason for referral.
- Refer to one of many private infusion clinics:
 - For clinic information and request forms, see:
 - [Northern Alberta: Private Infusion Clinics](#)
 - [Southern Alberta: Private Infusion Clinics](#).
 - Cost varies from \$100-\$250 per visit, plus additional cost of the IV iron prescription, depending on drug coverage.
- Defer to specialists (e.g., Gynecology, GI, General Internal Medicine, etc.) who are already following the patient OR refer to specialist if not already followed by other specialists as required.

5. Advice and Referral Options

Common reasons for IDA

Iron Deficiency or Iron deficiency Anemia	Considerations	Information
Nutritional Deficiencies	<ul style="list-style-type: none"> • Is there adequate oral intake of heme? • Iron sources (does the patient have a lower iron diet such as vegetarian)? • Is there a history of blood donation? • Have there been previous/recent surgeries? 	<ul style="list-style-type: none"> • Visit Alberta Referral Directory and search for nutrition counselling. • To learn more about programs and services offered in your zone, see Nutrition Services • Patients can also self-refer and speak to a Registered Dietician through Health Link 811 at Primary Care Alberta
Gastrointestinal Conditions	<ul style="list-style-type: none"> • Celiac disease • Inflammatory bowel disease (IBD) • Helicobacter pylori (H. pylori) infection • Previous bowel surgery • Iron Deficiency Anemia (IDA) Pathway for Colorectal Cancer Diagnosis 	<p>Investigations to exclude the GI tract as the underlying cause include:</p> <ul style="list-style-type: none"> • Celiac screen e.g., IgA transglutaminase antibodies for celiac disease) • IBD screen e.g., C-reactive protein and fecal calprotectin (stool) • Stool antigen for <i>Helicobacter pylori</i>. <p>A family history of celiac disease and IBD is important to obtain.</p>
Unexplained GI blood Loss	<ul style="list-style-type: none"> • Gastrointestinal blood loss is common and can be either overt (visible) or hidden. • Iron deficiency can be the first presentation of an asymptomatic malignancy. Timely investigation of this, after screening for other common causes, is important, particularly in patients over age 50. • A family history of malignancy is important to obtain. • Iron Deficiency Anemia (IDA) Pathway for Colorectal Cancer Diagnosis 	<p>If patient is hemodynamically unstable, see Red flags</p> <p>Use Gastroenterology referral practices in your area: Alberta Referral Directory - Main Search, Check local resources.</p> <ul style="list-style-type: none"> • Calgary Zone and Area - Gastroenterology (GI) Central Access and Triage - Referral Information Alberta Referral Directory (ARD) • Central Zone and Area - Gastroenterology & Endoscopy Central Access and Triage - Referral Information Alberta Referral Directory (ARD) • Edmonton Zone - Adult Gastroenterology Referral Pathway
Gynecological bleeding	<p>Provincial Adult Abnormal Uterine Bleeding Primary Care Clinical Pathway</p> <p>Provincial Post-Menopausal Bleeding Primary Care Clinical Pathway</p>	<ul style="list-style-type: none"> • Provincial Adult Gynecology Referral Pathway • Provincial Perimenopause and Menopause Primary Care Clinical Pathway
Hematuria	<p>Provincial Hematuria Evaluation Primary Care Pathway</p>	<ul style="list-style-type: none"> • Provincial Adult Urology Referral Pathway
Bleeding in other organ system	Refer as required.	<ul style="list-style-type: none"> • Provincial Adult General Surgery Referral Pathway

***NOTE:**

- Patients already followed by other specialties for ID and IDA need not be assessed by a hematologist
- Patients already responding to oral iron therapy need not be assessed by a hematologist


Referral information

Use referral practices in your geographic area. Determine if a referral to Hematology or General Internal Medicine is available/appropriate in your area:

- [Hematology Central Access and Triage at Calgary Zone and Area - Referral Information | Alberta Referral Directory \(ARD\)](#)
- [Hematology Clinic at Kaye Edmonton Clinic - Referral Information | Alberta Referral Directory \(ARD\)](#)
- General Internal Medicine (GIM) - [Alberta Referral Directory | Alberta Health Services](#)
- See [Alberta Referral Directory | Alberta Health Services](#) for more information

Advice options

If this patient needs to be directed to hospital through RAAPID or the ER, call [RAAPID](#) for on-call appropriate specialist or 911.

Zone	Program	Online Request	Phone Number
Urgent Telephone			
All Zones	RAAPID 	N/A	North: 1-800-282-9911 or 780-735-0811 South: 1-800-661-1700 or 403-944-4486
Non-Urgent Telephone			
Calgary	Specialist Link 	Online Request	403-910-2551
Edmonton, North	ConnectMD 	Online Request	1-844-633-2263

BACKGROUND

About this pathway

- This pathway was developed in collaboration with Hematology, primary care physicians, patient and family advisors, and the Provincial Pathways Unit.
- Condition-specific clinical pathways are intended to offer evidence-based guidance to support primary care providers in caring for patients with a range of clinical conditions.
- This pathway lives on Alberta's Pathway Hub and is updated and maintained by the Provincial Pathways Unit.

Authors and conflict of interest declaration

The authors represent a multi-disciplinary team. Names of the content creators and their conflict-of-interest declarations are available on request by emailing albertapathways@primarycarealberta.ca.

This pathway was initially developed under the auspices of Specialist Link by a multidisciplinary team. In 2026, the original pathway was reviewed and revised by a multi-disciplinary team in order to make it a provincial primary care clinical pathway for use in Alberta.

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Pathway review process, timelines

Primary care pathways undergo scheduled review every three years or earlier if there is a clinically significant change in knowledge or practice. The next scheduled review is **August 2029**. However, we welcome feedback at any time. Please send us your [feedback here](#).

DISCLAIMER

This pathway represents evidence-based best practice but does not override the individual responsibility of healthcare professionals to make decisions appropriate to their patients using their own clinical judgment given their patients' specific clinical conditions, in consultation with patients/alternate decision makers. The pathway is not a substitute for clinical judgment or advice of a qualified healthcare professional. It is expected that all users will seek advice of other appropriately qualified and regulated healthcare providers with any issues transcending their specific knowledge, scope of regulated practice or professional competence.

PROVIDER RESOURCES

Resource	Link
Iron Deficiency Anemia (IDA) Clinical Practice Guideline (Mar 2018, MyHealth.Alberta.ca Network)	iron-deficiency-anemia-guideline.pdf iron-deficiency-anemia-summary.pdf - Algorithm
Iron Dosing Frequency	Iron dosing frequency The College of Family Physicians of Canada
Preoperative Anemia Management and Hemoglobin (Hgb) Optimization (Alberta Health Services Patient Blood Management Program)	Patient Blood Management Program Alberta Health Services

PATIENT RESOURCES – Information for patients can be found in the below

Resources	Link
Patient Pathway on MyHealth Alberta > A webpage and two PDF formats are available to allow for easy printing, download, or scanning a QR code with the patient's smart phone for more information at their convenience.	Under development – to be available summer 2026
MyHealth.Alberta.ca	Iron Deficiency Anemia Getting Enough Iron

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