Understanding Iron Deficiency
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Video Transcript | Dr. Michelle Zeller | Hematologist, McMaster University

Introduction
Dr. Michelle Zeller: My name is Dr. Michelle Zeller and I'm a hematologist, or blood doctor, at McMaster University. I treat a lot of patients with iron deficiency and am absolutely passionate about blood and iron.

Why is iron important?
Iron is an essential nutrient that helps the body make hemoglobin, found in red blood cells, which carry oxygen to tissues in the body. Iron is also important in growth, development, cognitive function, and energy production. If the body doesn't get enough iron or loses too much iron, this can result in iron deficiency. As iron deficiency progresses, less red blood cells are made, resulting in iron deficiency with anemia.

Who is at risk of iron deficiency?
Those at highest risk include young children and individuals who are menstruating or pregnant, with highest prevalence in women. Also, those of lower socioeconomic status are disproportionately affected.

What causes iron deficiency?
There are four common causes of iron deficiency. Number one: there isn't enough iron being consumed, for example, due to an iron-restrictive diet. Number two: iron is being lost from bleeding. For example, menstrual losses, gastrointestinal bleeding; even regular blood donors can be at risk of iron deficiency. Number three: decreased iron absorption. For example, if patients have inflammation or are taking antacid pills, the body's ability to absorb iron is diminished. And finally, number four: there are phases in life when more iron is required, for example, in childhood, during growth and in pregnancy. Even extreme athletes can require more iron.

What are the symptoms of iron deficiency?
Symptoms of iron deficiency can occur even without anemia and can include fatigue, irritability, poor concentration, headaches, restless leg syndrome, and more. Our brains, blood, bodies, even our immune systems, function better when iron stores are normal.

How is iron deficiency diagnosed?
I was fortunate to participate in an international clinical practice guideline on how to diagnose iron deficiency, and am excited to share some of the recommendations. Iron deficiency is diagnosed with blood tests, and ferritin is the most commonly used. The threshold for diagnosing iron deficiency varies depending on patient population and presence of certain risk factors. Diagnosis of anemia uses a separate blood test called the complete blood count, or CBC, where the hemoglobin level is used to determine if anemia, or low blood levels, are present. There are many causes of anemia. However, iron deficiency is the most common cause worldwide.

How can you increase your iron?
Food is the main source of iron for most people, with both animal and plant sources. Some foods in Canada are iron-fortified, like cereal and pasta. Unfortunately, once a person is iron deficient, additional supplementation is likely required to replete iron stores beyond just food alone. That being said, maintaining normal iron stores can be achieved through an iron-rich diet in many people.

There are a lot of different types of oral iron supplements. These can be accessed with prescription, over-the-counter, or on the vitamins and supplements shelf at most stores. If a patient is unable to tolerate oral iron, if the deficiency and/or ongoing need are too great to achieve through oral replacement, or if urgent iron replacement is required, for example, in the case of an upcoming delivery or surgery, intravenous or IV iron is the iron repletion option of choice. IV iron is safe and effective in many patient populations.

Finally, red blood cell transfusions are reserved only for people with very severe and symptomatic iron deficiency anemia. Most health care providers can diagnose iron deficiency, so if you have concerns, please discuss them with your provider.

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