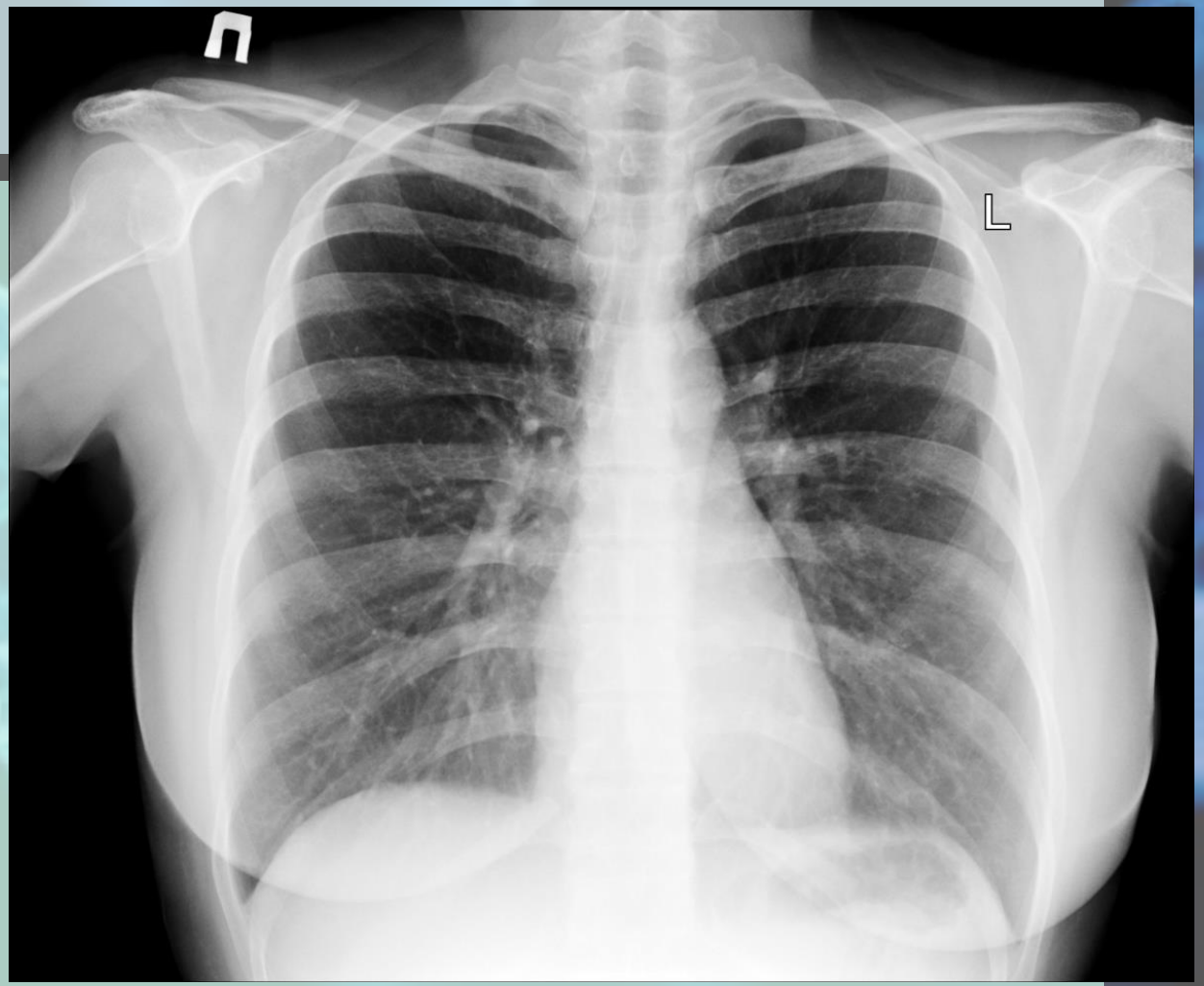
Health in the Future

X-Ray Analysis

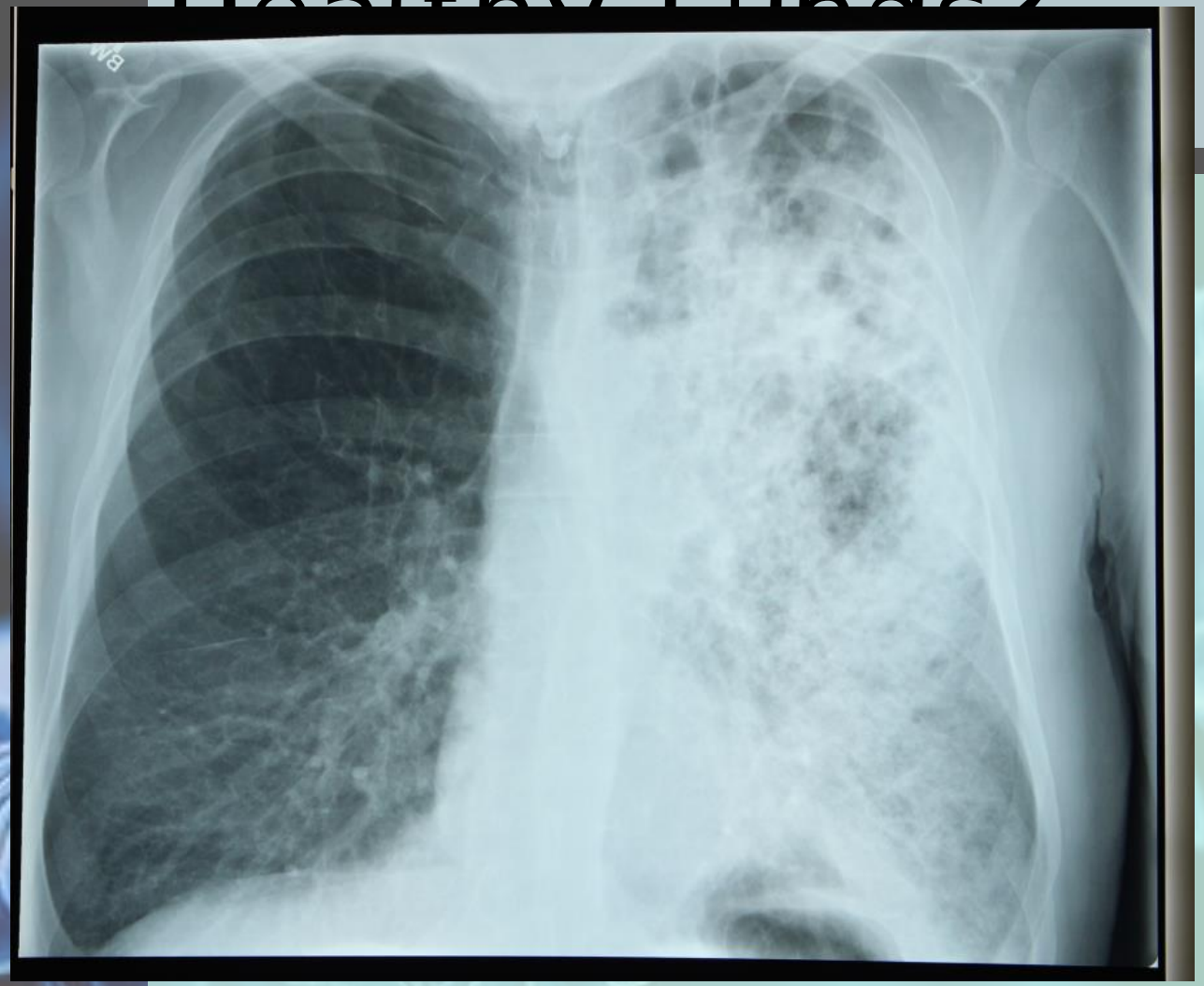
- Examine the following X-ray images of a chest.
- What do you notice about the light and dark areas of the X-ray?
- What is similar about the images?
- What is different about them?
- Which organs or bones can you identify?

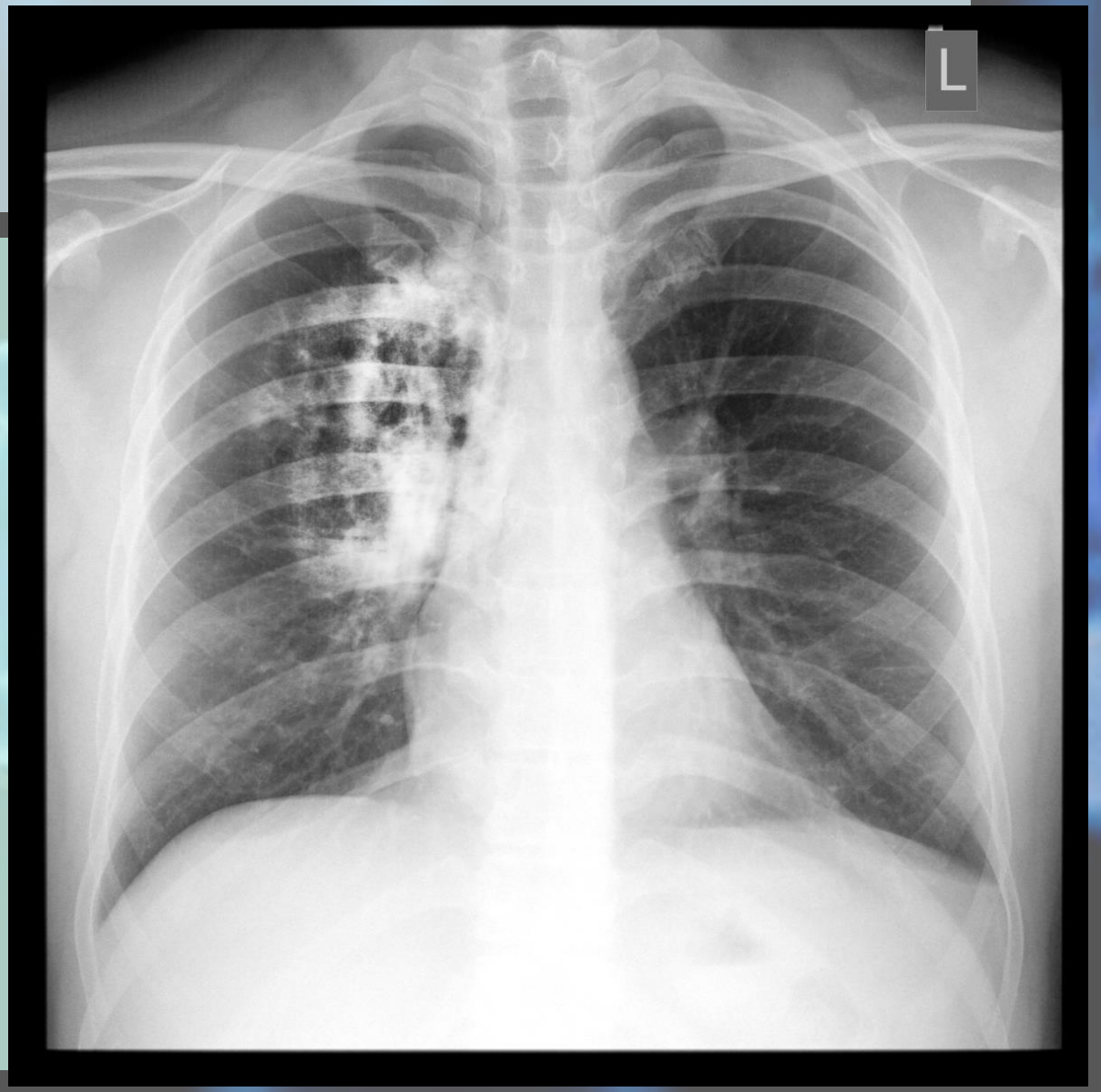

L

Healthy Lungs?

- Do you think the lungs shown in the above X-ray images are healthy? Explain why or why not.
- The lungs shown in these X-ray images are indeed healthy. They appear dark and fairly symmetrical with no large growths or masses, which would appear white. The large white section to the right of the middle lower chest is not a dangerous growth, but the heart. The rounded surfaces of the liver and stomach (parts of the digestive system) can also be seen just below the lungs.

Healthy Lungs2





Healthy Lungs?

- Do you think the lungs shown in the above X-ray images are healthy? Explain why or why not.
- The lungs shown in these X-ray images are unhealthy. Each image depicts a different issue that can arise in the lungs, shown by irregularly shaped white sections in what should be a dark lung. The left image shows lungs in varying stages of pneumonia. The right image shows a lung with developing cancer. Note that in the image on the left, the heart can barely be seen because there is so much interference in the image itself.

What do you think?

- Have you ever had an X-ray before?
- What might be a reason for taking an X-ray?
- Are there any safety precautions or side effects to having an X-ray? The accompanying image might give some clues if you look at it in detail.
- Based on what you know, what do you think are some positives and negatives related to using X-rays?
- Do you know of any other types of imaging technology that hospitals use? If yes, what are they?

X-Rays

- X-rays are one form of imaging technology (developed thanks again to science!) used extensively in modern healthcare.
- It was actually the first imaging technology widely used in hospitals.
- But other effective imaging technologies have been introduced since the first X-ray.
- Explore these further in the section which follows... as a group!

Looking inside the body

- When medical professionals are trying to diagnose an issue within your body, they rely on symptoms like your temperature, reflexes, blood pressure, throat swabs and even blood analysis.
- Sometimes, though, the issue will not be easily identifiable and require further testing.
- Luckily, through scientific advancement, medical imaging breakthroughs mean there is less of a guessing game involved in diagnosis.

Medical Imaging Technology

- Medical imaging is used to explore, diagnose and treat the human body.
- Imaging technology allows medical professionals and patients to "see" what is going on within the body without surgery.
- There are some instances in which imaging reveals things going on inside our bodies that would not be visible even if the body were cut open!
- This results in more accurate diagnosis with little or no harm to the patient.

Medical Imaging Technology

- In Canada, we are very fortunate to have many medical imaging technologies available to us.
- In Ontario, OHIP (Ontario Health Insurance Plan) covers the cost of medical professionals using this technology to diagnose their patients.
- Below, you will find an overview of some of the technologies used in Ontario and Canada to "see" inside the body without major surgery.
- Explore further...

Medical Imaging

In groups complete the organizer...

- X-Ray
- Computerized Axial Tomography (CAT) scan
- Magnetic Resonance Imaging (MRI) scan
- Ultrasound
- Endoscopy

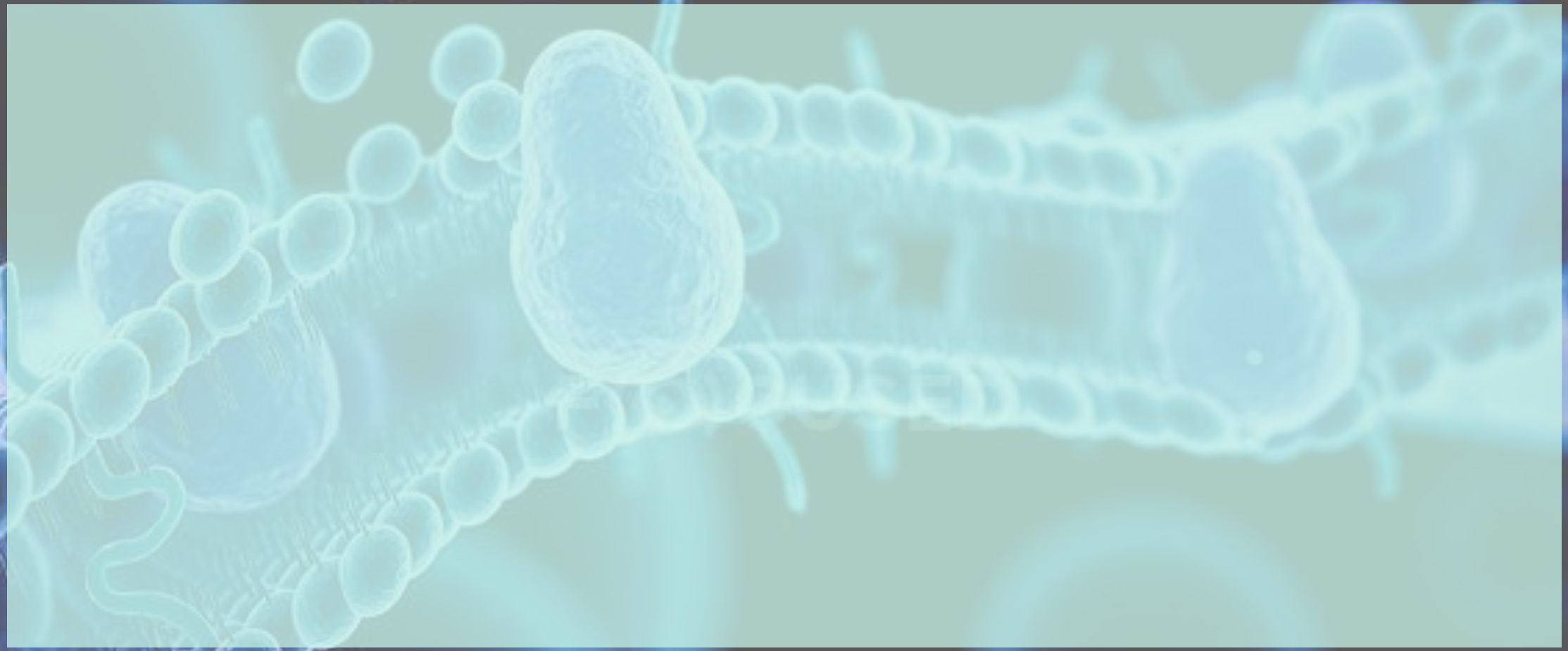
Pros and Cons of Medical Imaging

- Now that you are familiar with medical imaging technology, create a list of pros (positive aspects) and cons (negative aspects) for each one described above. You will need to complete an internet search to research this information. If you can, try also to find some short videos which explain these concepts.

Pros and Cons of Medical Imaging

- For example, the following video outlines how one form of endoscopy works while eliminating the need for sedation. This could be considered a pro when diagnosing cancer of the esophagus.

Video



Pros and Cons

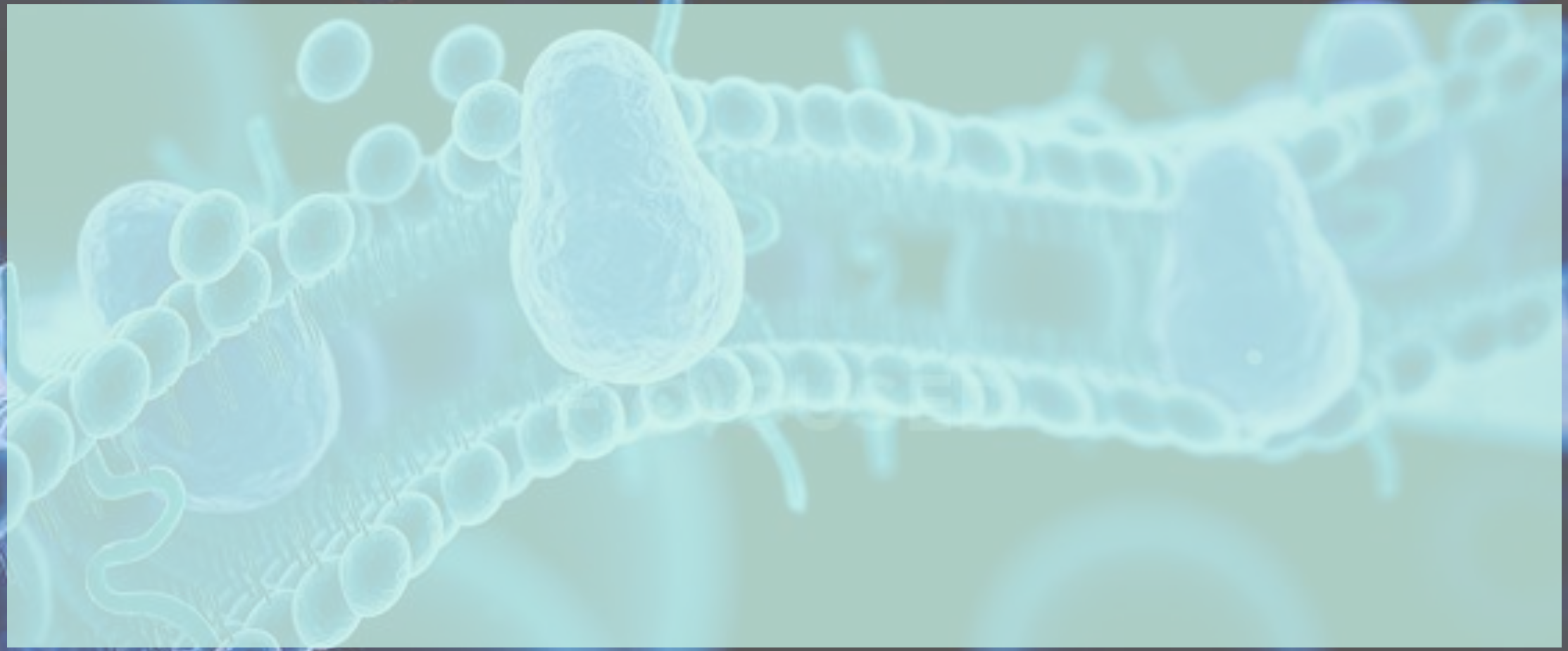
- Complete the following chart of pros and cons, being sure to include the specific sources for your information.
- Try to come up with two pros and two cons for each imaging technology.
- Be sure to check multiple credible sources so you can be sure the information is accurate. Don't just trust the first website you find!

Innovating for your Future

- Have you ever used a great product but wished it had an extra feature or two? Then have you given some thought to how you yourself might improve its design? If you have, you might just have an innovative mind!
- Innovators are people who do new things with or add on to existing products or technology in order to solve a problem. If you've ever watched a "life hack" video, you will have seen many innovators who do things differently by figuring out creative solutions using things already available to them.

- The same is true for innovators in medical imaging. The following article outlines how two teenagers from Toronto are potentially revolutionizing the medical imaging industry by improving upon existing MRI technology.

Article



Your Health is Your Responsibility

- Medical imaging technology is very helpful in the diagnosis of health-related issues, but did you know that your personal choices can actually help prevent certain types of health issues?
- Many decisions you make about your lifestyle directly impact your bodily health.

Your Health is Your Responsibility

- Think back to one of the first activities in this course about stomach acidity and antacids.
- There, we learned that the food we eat has an impact on our gut health.
- As the entertaining ads for antacids informed us, eating foods that do not provide the nutrients we need can cause us "nausea, heartburn, indigestion, upset stomach and diarrhea."
-

Your Health is Your Responsibility

- Just as we can prevent (or at least reduce) these immediate effects on our digestive systems with healthy eating, we can also prevent some other health issues if we maintain a healthy lifestyle.
- For example, in addition to eating nutritiously, we could also adopt other healthy habits like sleeping well, exercising regularly and staying hydrated.

Your Health is Your Responsibility

- While these cannot prevent completely every type of illness or health issue, they are extremely important to your good health.
- Ignoring them can put stressors on your body which could lead to illnesses such as obesity, diabetes, organ failure and many other ailments.

Your Health is Your Responsibility

- Compare your own lifestyle with what Nurse Robbie outlines in the following *Hot on Health* videos as to what you should or should not do to promote good health. Based on these, are there any changes you think you could make for a healthier lifestyle?


BANK

Which Would You Choose?

- Imagine that you have been invited to sit on a local committee for the selection of one new medical imaging technology for your community.
- You are required to help determine which technology will be purchased.
- Because of the high cost of these technologies, the hospital can afford to buy only one.
- Therefore, your selection needs to be based on sound reasoning and careful research.