

COVID-19 Vaccines – What Older Canadians Need to Know



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National Institute on Ageing

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About the National Institute on Ageing

The National Institute on Ageing (NIA) is a public policy and research centre based at Ryerson University in Toronto. The NIA is dedicated to enhancing successful ageing across the life course. It is unique in its mandate to consider ageing issues from a broad range of perspectives, including those of financial, physical, psychological, and social well-being.

The NIA is focused on leading cross-disciplinary, evidence-based, and actionable research to provide a blueprint for better public policy and practices needed to address the multiple challenges and opportunities presented by Canada's ageing population. The NIA is committed to providing national leadership and public education to productively and collaboratively work with all levels of government, private and public sector partners, academic institutions, ageing-related organizations, and Canadians.

The NIA further serves as the academic home for the National Seniors Strategy (NSS), an evolving evidence-based policy document co-authored by a group of leading researchers, policy experts and stakeholder organizations from across Canada and first published in 2014.

The NSS outlines four pillars that guide the NIA's work to advance knowledge and inform policies through evidence-based research around ageing in Canada: Independent, Productive and Engaged Citizens; Healthy and Active Lives; Care Closer to Home; and Support for Caregivers.

About UHN and Sinai Health's Healthy Ageing and Geriatrics Program

Sinai Health and University Health Network's Healthy Ageing and Geriatrics Program is dedicated to the care of all older persons, particularly the complex and frail. We provide interpersonal expertise, conduct research, implement innovative models of care, educate ourselves and others, and collaborate with all partners to enable healthy ageing.

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Introduction

From the beginning of the COVID-19 pandemic there has been the belief that the only way we can return to “normal” life is with the development and distribution of safe and effective vaccines.

In late 2020, two vaccines developed by Pfizer-BioNTech and Moderna were approved in Canada, the United States, and Europe, to protect adults from getting sick and possibly dying from COVID-19. In early 2021, two additional vaccines were approved for use in Canada; one by AstraZeneca in partnership with Oxford University and one by Johnson & Johnson. News of these four COVID-19 vaccines being developed and approved in less than one year has been met with excitement and hope, but also skepticism, particularly among older adults and some of the most vulnerable members of our society.

There are many legitimate questions and misconceptions out there about these COVID-19 vaccines, how they came to be, and what they mean for our personal health.

Here are some common questions arising about COVID-19 vaccines amongst older Canadians along with evidence-informed answers to help keep you up to date with the facts.

I’m an older adult, should I get a COVID-19 vaccine?

The COVID-19 vaccines that have been approved in Canada for use in older Canadians, have been found to be both extremely safe and effective.

There are many benefits associated with receiving the COVID-19 vaccine – most importantly they will lower your risk of getting sick if you are exposed to the virus and protect those around you that may also be at risk of getting seriously ill.

The Public Health Agency of Canada and Canada’s Medical and Nursing Associations recommend that all older Canadians get vaccinated when they are able to do so. The approved Pfizer-BioNTech, Moderna and AstraZeneca vaccines require two doses in order for your body to develop adequate immunity or protection from them. The approved Johnson & Johnson vaccine requires just one dose to develop adequate immunity or protection from it.

A few weeks after becoming fully vaccinated, each of these vaccines are expected to be essentially 100% effective in preventing you from becoming hospitalized or dying from COVID-19.

How do vaccines work?

Your immune system is designed to attack anything that is foreign to your body, such as a virus or bacteria. When it encounters something new, like the COVID-19 virus, it takes a while for the body to ramp up its immune system or defenses. Since it has never seen the virus before, by the time it is ready to fight back, the infection can already have caused a lot of damage that can sometimes lead to severe illness and death. But, once it fights off that virus, it also produces a special kind of immunity memory or long-lasting protection that helps it remember how to fight off that virus. So, the next time you come into contact with the same virus, your body remembers it and is able to quickly assemble its defence system against it.

This is where vaccines can be advantageous. They allow the body to ramp up an immune response against a variety of disease-causing organisms. This means that later, if your body comes across an actual disease-causing organism you have been immunized against, it can quickly recognize and respond immediately to it and fight it off before it causes serious health issues.

Traditional vaccines are made up of small or inactivated doses of the whole disease-causing organism, or the proteins that it produces, which are introduced into the body to provoke the immune system into mounting a response. Some traditional vaccines use a weakened adenovirus that can no longer cause infection in

humans, to carry instructions for our bodies to make mRNA molecules, which then instructs our bodies how to make viral proteins. Both currently approved AstraZeneca and Johnson & Johnson COVID-19 vaccines are adenovirus vaccines. In contrast, mRNA vaccines deliver just the mRNA molecule, which then instructs the body into producing some of the viral proteins itself. The Pfizer-BioNTech and Moderna COVID-19 vaccines are mRNA based.

What is mRNA and how is it used to make vaccines?

mRNA or messenger RNA, is a naturally occurring molecule in our bodies and is similar to a recipe card that essentially puts genetic instructions into action. mRNA gives instructions to our bodies to make necessary proteins.

Prior to the COVID-19 pandemic, researchers have been studying and working with mRNA-based treatments for decades.

As soon as the necessary information about the virus that causes COVID-19 was available, scientists began designing the first approved mRNA COVID-19 vaccines. In these vaccines, synthetic mRNA is used to tell the body to make a harmless piece of the 'spike protein' that is found on the surface of the actual COVID-19 virus. These vaccines work by delivering mRNA

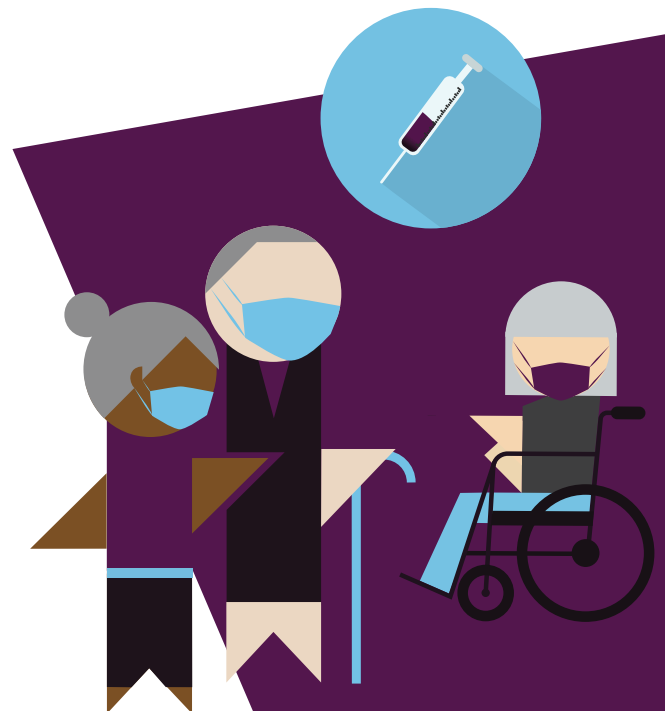
instructions or a 'recipe card' that direct the body to produce a small amount of the spike protein. Our body recognizes that this protein doesn't belong in it and ramps up an immune response by producing protective antibodies against the COVID-19 virus' 'spike protein' so if later our body comes in contact with an actual COVID-19 causing virus, it immediately knows how to fight it off. The mRNA in the vaccine does not last long in the body, as it quickly gets broken down. The mRNA from the vaccine cannot get into your DNA.

mRNA vaccines are an exciting scientific advance, and will allow us to design vaccines for other viruses as well such as influenza, Zika, rabies, and cytomegalovirus (CMV). mRNA vaccines are also being studied as a novel way to fight cancer.

What is an adenovirus and how is it used to make vaccines?

Adenovirus is a virus that can cause the common cold. The adenovirus genome has been well studied, so scientists know how it works and how to modify and weaken it so that it cannot make copies of itself when it is used to make vaccines. The weakened vaccines have no ability to make you sick, however, these weakened adenoviruses can still trigger a robust immune response. Not only are adenovirus vaccines easy to design, but they are also easy to produce on a mass scale which is especially useful during a pandemic.

In these vaccines, the directions to make the COVID-19 virus' 'spike protein' is inserted into the modified adenovirus. The AstraZeneca and Johnson & Johnson COVID-19 vaccines use different types of adenoviruses to make their vaccines. When injected into a person, the directions are made into mRNA, which then instructs our bodies on how to make the COVID-19 virus' 'spike protein' to which our bodies can then generate an immune response. It is important to remember that these vaccines also do not cause any changes to your DNA and in fact, are also broken down fairly quickly in your body.



COVID-19 vaccines have been developed very fast. Have important steps been skipped in their development, and are they safe?

According to the Public Health Agency of Canada's [website](#), all of Canada's approved COVID-19 vaccines were:

- tested on hundreds of thousands of participants, including older adults, through extensive clinical trials
- have met all the normal requirements for approval, including all of the usual safety requirements for vaccines, and no requirements were overlooked in order to approve these vaccines
- and will be monitored for any adverse reactions that may occur after vaccination

Countries and companies across the world have banded together and collaborated in a way we haven't seen in the past to help develop these vaccines. Health agencies and vaccine researchers and manufacturers have prioritized the development of COVID-19 vaccines by investing huge sums of money, redeploing staff, and developing several collaborations to work on COVID-19 vaccine related efforts. None of this occurred at the expense of safety, and due diligence was absolutely done in

the clinical trials that were required to demonstrate both their safety and efficacy.

Other factors that accelerated the creation of the approved COVID-19 vaccines include:

- the development of our earliest COVID-19 vaccines were based on decades of research that has been conducted on other strains of coronavirus prior to COVID-19, such as Middle East Respiratory Syndrome (MERS) and SARS-CoV (SARS)
- additional advances in science and technology making the development of new vaccines easier; once the virus was genetically sequenced which occurred soon after the COVID-19 virus was discovered, scientists could quickly get to work to create a variety of vaccine candidates and start clinical trials
- strong international collaboration among scientists, health professionals, researchers, industry and governments including ample funding to implement the large clinical trials needed to more quickly test and establish the safety and effectiveness of the vaccines being developed

Are the COVID-19 vaccines effective in older adults?

Yes, the Pfizer-BioNTech, Moderna and Johnson & Johnson vaccine trials enrolled enough older adults in their original vaccine trials, to establish that their COVID-19 vaccines are both safe and effective in them.

While the initial AstraZeneca vaccine trials did not enrol sufficient number of older adults to clearly establish their effectiveness initially amongst them, subsequent clinical trial data from the US-based trial as well as real world evidence from its use in millions of older persons in the United Kingdom has helped to confirm that this COVID-19 vaccine is both safe and effective in older persons as well.

While the overall efficacy of the Pfizer-BioNTech, Moderna, AstraZeneca and Johnson & Johnson vaccines vary at preventing laboratory-confirmed COVID-19 illness in people, their efficacy in preventing hospitalization and death has been found to be 100% for individuals fully vaccinated in the clinical trials evaluating the effectiveness of these vaccines.

Comparing differing efficacy rates between the vaccines is not recommended, because each trial has slightly different efficacy

endpoints - so these cannot be equally compared to each other. In addition, the clinical trials related to different COVID-19 vaccines were done in different countries at different time points in the pandemic, and the amount of COVID-19 circulating as well as the number and type of variants circulating during these trials could have impacted their efficacy results. What is important to remember is that all of the vaccines are very effective in preventing severe illness, hospitalizations and COVID-19 related deaths.

What we do not know yet is how effective being vaccinated will be in reducing the risk of transmission or passing the virus along to someone else, although emerging evidence now strongly suggests that these vaccine recipients are significantly less likely to transmit infection to others. However, while the vaccines do reduce the risk of transmission, we cannot yet say they eliminate it. As a result, until COVID-19 case numbers are down and most Canadians have received their vaccines, we should not stop other important public health measures to prevent the spread of COVID-19. Mask wearing in public, physical distancing, frequent hand washing, and avoiding crowded settings remain important strategies for now.

What are the side effects of the COVID-19 vaccines in older adults?

Vaccine side effects mean that the body's immune system is kicking in and getting ready to recognize and fight off the virus if it ever encounters it in the future.

The side effects associated with COVID-19 vaccines are usually mild and no different in older adults than in the rest of the population.

What is most reassuring is that no clear pattern of serious or unexpected adverse events have occurred amongst the tens of millions of older adults who have been vaccinated already.

Vaccine side effects may include a sore arm where you were injected, a headache, muscle aches, fatigue, fever or diarrhea that can last for a day or two, and rarely more than a few days. If side effects last longer than two days, contact your doctor.

Vaccine side effects are typically a sign that your immune system is doing exactly what it is supposed to do: working and building up your immunity to protect you from what you are being vaccinated against.

In fact, as older adults tend to have weaker immune systems than younger people, they appear to be developing a lower rate of the above mentioned side effects, but are still achieving the same level of immunity or protection that younger adults achieve with these vaccines.

You can have an allergic reaction to any medicine or food. It is possible that some people are allergic to an ingredient in the COVID-19 vaccines; but, it is important to remember these allergic reactions are relatively rare. It is recommended that if you have allergies, including severe allergies that require you to carry an EpiPen, to discuss the vaccine with your doctor who can assess your risk and provide more information about how to get vaccinated safely.

Should people take acetaminophen (also known as Tylenol) or non-steroidal anti-inflammatory drugs before getting vaccinated to prevent post-vaccination symptoms?

When these medications are taken before the vaccination, they could theoretically weaken an individual's immune response and make the vaccines less effective — hence they are not recommended to be taken before vaccination. They are useful,

however, in diminishing side effects once they occur after the vaccination. Acetaminophen (also known as Tylenol) is preferred for older persons.

Is it safe to get the COVID-19 vaccine in older adults who are immunocompromised?

Immunocompromised patients, or those with weakened immune systems, tend to be at increased risk from becoming seriously ill and dying from COVID-19.

This can include older persons living with cancer, HIV, those who are transplant recipients, or are taking steroids or other medicines to treat certain medical conditions, called immunosuppressants, that lower the body's ability to fight some infections. Because of their increased risk of becoming seriously ill and dying from COVID-19, immunocompromised people should receive the COVID-19 vaccines if there are no absolute contraindications. As none of the currently approved vaccines include live virus, there is no risk of getting infected with the actual virus when getting vaccinated.

Overall, for older Canadians with well-controlled immune disorders, medical experts emphasize that the positive benefits of the COVID-19 vaccines almost always outweigh any risks, and immunization is recommended.

Furthermore, it's always good to check for the latest information and advice around the safety and effectiveness of these vaccines with your doctor who knows your overall medical situation well.

What about the AstraZeneca COVID-19 vaccine? Is this a good option for older Canadians?

The COVID-19 vaccine developed by AstraZeneca and Oxford University was approved for use in Canada in early 2021. Initially, this vaccine was not recommended for use in older adults, by Canada's National Advisory Committee on Immunization (NACI) due to a lack of sufficient evidence to determine whether it was effective in older populations at that time. Emerging clinical trial data from the United States and robust real-world evidence to support its effectiveness in older persons, along with no additional safety concerns in this age group, allowed NACI to recommend its use in older Canadians on March 15, 2021. Several other countries in Europe have also similarly revised their guidance as well.

I heard people were developing blood clots after getting the AstraZeneca vaccine, is that true?

After some initial concerns had surfaced that the AstraZeneca vaccine could lead to blood clots, several European countries

halted their use of this vaccine until they could determine if this was the case. The European Medicines Agency (EMA) on March 18, 2021 determined that the AstraZeneca vaccine was not associated with an increased overall risk of blood clotting disorders. Amongst the nearly 20 million individuals who had received the AstraZeneca vaccine across the United Kingdom and Europe, the EMA did note that there have been very rare cases of unusual blood clots accompanied by low levels of blood platelets (components that help blood to clot) after vaccination, however, this usually occurred in women under 55 years of age. Overall, the EMA determined that because COVID-19 can be so serious and is so widespread, the benefits of the AstraZeneca vaccine in preventing it outweigh the risks of side effects, especially amongst older persons.

This situation, highlights the importance of continuing to do post-approval surveillance to observe for any extremely rare adverse effects. What this incident tells us is that we have strong mechanisms in place to ensure that even extremely rare side effects are being fully investigated.

I heard that older adults are dying after getting the COVID-19 vaccine, is that true?

The reports of 23 older vaccine recipients in Norway dying after getting vaccinated has NOT been proven to have been caused by the vaccine. The World Health

Organization [found](#) that there was no “unexpected increase in deaths of frail, elderly individuals or any unusual adverse events following the vaccinations.”

Currently, the vast majority of the older populations of the United States, United Kingdom and Israel have all been vaccinated without any verified reports of unexpected deaths or any unusual adverse events after receiving the (or that were caused by the) COVID-19 vaccine.

For older Canadians living in long-term care homes or the community, medical experts continue to emphasize that the positive benefits of the COVID-19 vaccines almost always outweigh any risks, and immunization is recommended.

Is it safe and recommended for older persons living with dementia to get the COVID-19 vaccine?

Age is the greatest risk factor for having dementia. And according to Statistics Canada, at least one-third of the Canadians who have died from COVID-19 also were living with Alzheimer’s disease or other dementias.

People living with dementia often live with at least one other chronic condition, and have been shown to be at much greater risk, compared to people without dementia, of getting infected, seriously ill and dying from COVID-19 especially if they are people of colour.

People living with dementia are more likely to have problems remembering and understanding recommended public health measures, like physical distancing and wearing a mask in the presence of others which significantly increases their risk of getting infected from COVID-19. This is why the Public Health Agency of Canada, Canada’s Medical and Nursing Associations, and the [Alzheimer Society of Canada](#) all recommend that all older Canadians, including those living with dementia, get vaccinated when they are able to do so.

There is some concern that some of the limited side-effects associated with COVID-19 vaccines, like a sore arm, headache, muscle aches, fatigue, fever or diarrhea that can last for a day or two may cause some increase confusion in a person living with dementia, but these post-vaccination side-effects can usually be well-managed with acetaminophen or other treatments. Millions of older persons around the world living with dementia have now safely received their COVID-19 vaccines, and medical experts continue to emphasize that the positive benefits of the COVID-19 vaccines

almost always outweigh any risks, and immunization is especially recommended for people living with dementia.

I’m an older adult that already had COVID-19, do I need to get the vaccine?

Even if you have already contracted COVID-19 you will still benefit from getting the vaccine because re-infection is possible.

Currently, there is not enough information to say how long someone is protected from getting COVID-19 once they have had the infection but early evidence suggests natural immunity may not last longer than several months. Because re-infection after people have recovered from COVID-19 has been found to be rare in the first 90 days, some people may wish to defer getting vaccinated for this long — however, if they wish to be immunized sooner, there is no contraindication to do so.

Scientists believe COVID-19 vaccines offers a more guaranteed, longer and therefore better level of protection against COVID-19 through immunization rather than having a natural infection.

Does getting the vaccine mean that I will get COVID-19?

The two COVID-19 vaccines that are currently available to Canadians cannot and will not give you COVID-19. All vaccines basically carry a recipe card that your body then uses to make just the small piece of harmless spike protein that is similar to the protein that exists on the actual COVID-19 virus, which helps your body recognize and fight the virus.

The COVID-19 vaccine does not actually contain the COVID-19 virus, so you cannot get COVID-19 from the vaccine. The synthetic DNA and mRNA that is central to the COVID-19 vaccines also breaks down quickly once it enters your body.

The COVID-19 vaccine will not make a nasopharyngeal (nasal) PCR test positive. If you test positive for COVID-19 on nasopharyngeal (nasal) PCR test, this means you have a COVID-19 infection, and is unrelated to the vaccine.

I heard the materials in the vaccine are harmful, is that true?

Both the Pfizer-BioNTech and Moderna vaccines contain mRNA and other, normal vaccine ingredients, such as fats (which protects the mRNA), salts, as well as a small amount of sugar. The AstraZeneca

and Johnson & Johnson contain DNA and other normal vaccine ingredients similar to the mRNA vaccines.

All of the approved COVID-19 vaccines were not developed using any animal including cow or pork by-products. The Pfizer-BioNTech and Moderna vaccines were not developed using fetal cell lines, but similar to many other vaccines, the AstraZeneca and Johnson & Johnson vaccines were. It is important to note, that none of the vaccines contain any fetal tissues or cells. The currently approved vaccines do not contain common allergens such as latex, milk, lactose, gluten, egg, maize/corn, or peanuts and they do not contain any material such as implants, microchips or tracking devices.

Will the COVID-19 vaccine protect against the new virus variants that are emerging?

There are two COVID-19 virus variants of concern that have been seen in the UK and South Africa. The variant first found in the UK improves how well the virus's spike protein can attach to our cell receptors so it makes it stickier and therefore it can be up to 50% more transmissible. The variant found in South Africa is stickier but also includes a mutation that helps the virus to disguise part of its signature appearance which allows it to slip past immune response.

Pfizer-BioNTech, Moderna, AstraZeneca and Johnson & Johnson have found that their COVID-19 vaccines are effective against the variant first found in the United Kingdom, while the Pfizer-BioNTech, Moderna, and Johnson & Johnson vaccines have only seen a modest decrease in their efficacy against the variant first found in South Africa.

Pfizer-BioNTech and Moderna have indicated that they are considering adding a booster shot to their vaccine regimen. It is still recommended that you get the COVID-19 vaccine as soon as you are able to do so.

I'm an older adult living in the community, when will I get the vaccine?

According to the Government of Canada and its provinces and territories, older Canadians should start to get vaccinated by March while all adults should expect to have received a first dose of a vaccine by June 2021. Continue checking government websites and listening to the news for updates on when vaccines will be available in your area.

I am caring for an older adult that does not want to get the vaccine, how can I convince them that it is safe?

You can show an older adult COVID-19 Q&A's like this one or any of the links below that answer questions specifically related to older adults.

Also emphasise to the older adult in your life that COVID-19 is a serious illness, and that over 95% of Canada's COVID-19 deaths have been amongst older Canadians 60 years of age and older. It is understandable that older adults may be wary of the COVID-19 vaccine but knowing the facts that any potential risks of side effects related to getting the vaccine

are likely far better than the risk of dying from COVID-19 should provide reassurance, especially when millions of older people around the world have safely received the COVID-19 vaccine so far.

I am a member of a racialized community and am hesitant to get the COVID-19 vaccine, how do I know it's safe for me?

It is understandable for racialized individuals, particularly Black and Indigenous Canadians, to be hesitant to get the vaccine due to systemic racism and historical mistrust of the Canadian health care system. However, Canadians of colour have been disproportionately affected by COVID-19 due to social, economic and health disparities and getting the vaccine can provide them with the greatest level of protection from this virus.

Furthermore, Pfizer-BioNTech, Moderna, AstraZeneca and Johnson & Johnson have said the efficacy of their vaccines has been consistent across age, race and ethnicity, and gender demographics.

Now that vaccinations are underway, when will we be able to go back to regular life?

We will all have to continue to wear masks in public, continue to physically distance from others and stay home as much as possible for the foreseeable future. Getting COVID-19 under control in Canada will take time. Right now the Canadian government is hoping that every Canadian who wants a COVID-19 vaccine will get one by September 2021.

If more than 80% of adult Canadians get vaccinated by then – we will likely have achieved a level of ‘herd immunity’ or community protection that may allow us to return to a to a level of normalcy.

Are there other vaccines that I should be getting?

Absolutely! The Public Health Agency of Canada recommends that all older Canadians stay up to date on all the vaccinations that are recommended for them.

For example, it is recommended that all older adults get their annual influenza (flu) vaccination every year in the fall, and that all get vaccinated to protect them against pneumococcal disease (a common cause of pneumonia in older people), herpes zoster (shingles), tetanus, pertussis, and hepatitis A and B. It's best to check with your primary care provider or pharmacist on what vaccines you may be eligible for.

Additional Helpful Resources

- [World Health Organization - COVID-19 vaccines](#)
- [Public Health Agency of Canada – COVID-19 information and resources: reducing your risk for infection and spreading the virus](#)
- [Public Health Agency of Canada - Canada's COVID-19 Immunization Plan: Saving Lives and Livelihoods](#)
- [Alzheimer Society of Canada – COVID-19 Vaccination Rollout](#)
- [Thrombosis Canada Updated Statement On Astrazeneca Vaccine And Blood Clots](#)
- [Thrombosis Canada Guidance On Covid-19 Vaccines And Anticoagulation](#)
- [Government of Ontario - COVID-19 Vaccine Safety](#)
- [Unambiguous Science](#)
- [Sinai Health – Ask an expert: Get to know the COVID-19 vaccines](#)
- [Johns Hopkins Medicine - COVID-19 Vaccines: Myth Versus Fact](#)
- [CBC News - Physicians say COVID-19 vaccines both safe, protective for elderly Canadians. Here's what seniors need to know](#)
- [The Globe and Mail - Vaccine myths running rampant online among all age groups, Ontario doctors say](#)

To learn more about the NIA visit our website at <https://www.nia-ryerson.ca/> and follow us on twitter @RyersonNIA