

Appendix 1 – Common Cited Reasons for Refusing Vaccines

Appendix 1 – Common Reasons for Vaccine Refusal ^{13–16}	
Concerns on the Need for Vaccines	
<p>Didn't many of these diseases disappear before vaccines became available?</p>	<ul style="list-style-type: none"> • Incidence of vaccine-preventable diseases dropped rapidly with the introduction of new vaccines to the Canadian market. • Even in developed nations with excellent health care, clean drinking water and sanitation, vaccine-preventable diseases can occur when immunization rates decrease (e.g. pertussis, measles) • GAVI has an excellent tool on Vaccine-Preventable Outbreaks Map that shows outbreaks throughout the world.
<p>Many diseases against which we vaccinate are no longer around, why not just stop?¹⁴</p>	<ul style="list-style-type: none"> • Although many of the diseases are rare in North America, history has shown that these diseases make a comeback if we stop immunizing • This was seen with measles in North America when a case imported from overseas infected multiple people at an amusement park in California • Other cases such as outbreaks of measles with decreased MMR vaccination in Europe, and increase in pertussis in the UK • All of these conditions are simple plane ride away
<p>Not all vaccines are needed. Can I just have the more important ones?</p>	<ul style="list-style-type: none"> • All of the diseases that children are vaccinated against are important. They can all cause serious illness, complications and death, even with the best medical care. Many of these diseases also have no cure. <ul style="list-style-type: none"> ○ Measles outbreaks still happen. Complications occur in about 10% of cases. For every 1,000 cases of measles, 1 or 2 of those people will die and 1 will have encephalitis. ○ Pertussis (“whooping cough”) kills between 1 and 4 babies in Canada every year. About 1 in 400 babies who survive pertussis has permanent brain damage ○ Tetanus kills 10% or more of its victims
<p>Do I really need to vaccinate my child if so many others are vaccinated?</p>	<ul style="list-style-type: none"> • Some people will assume that they or their children are protected through herd or community immunity • There are several issues with this logic in that some conditions like pertussis and measles require an immunization rate of over 95% to achieve herd immunity • Most of the outbreaks of infections (e.g. measles) in North America occur in communities where people are not properly immunized

	<ul style="list-style-type: none"> • For some infections (e.g. tetanus) community immunity does not occur • Not immunizing healthy children places those children who can't receive a vaccine because of health problems (e.g. cancer, immunodeficiency) at risk of these life-threatening conditions • Immunizing your child not only protects your child but helps protect the community. • The best way to protect a person is to ensure up-to-date immunizations
<p>Do vaccines really work?</p>	<ul style="list-style-type: none"> • Vaccines are highly effective; serious disease can occur if a person, their child and family are not immunized • Immunization is one of the most important ways to promote health • Over the past 50 years, immunization has saved more lives in Canada than any other health intervention • Immunization protects both individuals who receive the vaccine and the people with whom they come in contact, especially those who cannot be vaccinated or are incompletely vaccinated due to medical conditions or age • The World Health Organization estimates that every year, more than two million deaths are prevented worldwide due to immunization • Immunization provides cost savings to the individual and to society
<p>Isn't immunity from disease more "natural" than that from vaccine?</p>	<ul style="list-style-type: none"> • Infection with a virus or bacteria can increase risk for morbidity and mortality • Immunity after most vaccines is similar to immunity that is induced by the disease, but without the risk of illness, permanent damage or death that the disease may cause • Vaccines provide protective levels of the same kinds of antibodies and immune cells that are made after a disease • Antibodies from vaccines are produced prior to exposure to an infection so they are ready to fight immediately when exposed to the disease in real life • Some vaccines, such as tetanus, actually produce a stronger immunity than occurs after infection; tetanus infection which often does not result in immunity

	<ul style="list-style-type: none"> • Natural disease can kill or seriously harm the child, whereas vaccines have the benefit of protection and the lack of problems of disease.
<p>Do breastfeeding and good nutrition prevent these infections?</p>	<ul style="list-style-type: none"> • Maternal antibodies are passed to an infant through breastfeeding • Breastfeeding has been shown to protect against many illnesses including: ear infections, allergies, intestinal disorders, colds, diabetes, urinary tract infections, and Sudden Infant Death Syndrome (SIDS) • Breastfeeding does not protect against vaccine-preventable diseases • Babies receive passive protection via transfer of antibodies through the maternal placenta • This protection is temporary and depends on what the mother is immune to • There are many benefits to eating a nutritious and well-balanced diet, but these benefits do not include protection against vaccine-preventable diseases.

Concerns Regarding the Immune System

<p>Can multiple vaccines overwhelm the baby's immune system?</p>	<ul style="list-style-type: none"> • New babies come in contact with millions of germs when born and their immune system can respond immediately. • Babies can make over 1 billion antibodies and could theoretically handle up to 10,000 shots at any one time. • New vaccines have significantly fewer antigens than their counterparts in the past.
<p>Isn't giving multiple injections at the same time less harmful than giving the vaccines on separate occasions?</p>	<ul style="list-style-type: none"> • Multiple injections are an effective way of ensuring up to date immunization • Generally, infants and children have similar immune responses whether vaccines are given at the same time or at different visits • Giving several routine vaccines at the same visit does not result in increased rates of adverse reaction, compared to giving the vaccines at different visits. • Evidence has shown that multiple injections at one visit cause less pain than waiting a few days between administration of injections.

<p>Are combination vaccines more dangerous than single component vaccines?</p>	<ul style="list-style-type: none"> • Combination vaccines are just as safe and effective as single component vaccines and save the child from having to have many more shots
<p>Is 2 months old too young for vaccines?</p>	<ul style="list-style-type: none"> • Vaccines are given at specific ages when the child is most vulnerable to the infection or its complications. • Many infections are more serious in young infants, who need vaccines to ensure they are protected. • Infants in this age group can develop a response to the antigens in the vaccine so are then able to fight off the infection when they come in contact with it
<p>Specific Safety Concerns</p>	
<p>Can measles vaccine or measles-mumps rubella (MMR) vaccine cause autism or other developmental disorders?</p>	<ul style="list-style-type: none"> • Vaccines are not linked to autism • The concern about autism was based on a retracted study from 1998 that was later found to be fraudulent and Dr. Andrew Wakefield, the author, was found guilty of professional misconduct • A large study of 537,303 children in Denmark found no link between the MMR vaccine and autism; many other studies also found no link
<p>Can vaccines cause serious conditions like brain damage, MS, SIDS, asthma, diabetes?</p>	<ul style="list-style-type: none"> • There is no evidence that any vaccine causes chronic diseases, autism, brain damage or sudden infant death syndrome • There have been many studies that have looked at whether a relationship exists between vaccines and the development of chronic diseases • Research studies have found that vaccinations do not cause asthma, multiple sclerosis (MS), Type 1 diabetes and chronic fatigue syndrome, as well as several other conditions
<p>Is the mercury in vaccines is linked to serious diseases?</p>	<ul style="list-style-type: none"> • There is no scientific evidence that thimerosal has caused brain damage, autism or any other neurologic problems as a result of vaccination. Ethyl mercury in thimerosal is very different from methyl mercury, which can cause severe brain damage. • Thimerosal-containing vaccines do not cause autism • Thimerosal has not been used in routine childhood vaccines in Canada since 2001.
<p>Is the formaldehyde in vaccines dangerous?</p>	<ul style="list-style-type: none"> • Formaldehyde is used in the production of vaccines to kill and inactivate viruses and bacteria.

	<ul style="list-style-type: none"> • It is naturally found in our bodies and is essential for human metabolism and the synthesis of amino acids. • The amount normally found in an infant’s circulation is much higher than the amount contained in any vaccine.
Do vaccines contain human or animal cells?	<ul style="list-style-type: none"> • Although human or animal cells may be used in the production of vaccines, they have been removed by the purification process. • Trace amounts of cellular proteins may remain.
Isn’t aluminum in the vaccines very toxic?	<ul style="list-style-type: none"> • Aluminum has been used as an adjuvant for the past 70 years in vaccines • It enhances the immune response to vaccines • Vaccines contain the same amount that is found in breast milk and infant formula • Vaccines containing this adjuvant have been found to be very safe
Why do vaccines have to be so painful?	<ul style="list-style-type: none"> • A major cause of vaccine hesitancy is vaccine-related pain • Reducing pain during vaccine injections: clinical practice guideline provide evidence-based suggestions to reduce vaccine-related pain in many different age groups

Concerns About How Vaccines are Licensed and Used

Aren’t vaccines very easy to approve in Canada?	<ul style="list-style-type: none"> • The approval of vaccines is more rigid than most drugs available in Canada • The government will only approve a vaccine after following these steps: <ul style="list-style-type: none"> ○ Vaccines are only approved after they are proven to be safe and effective. ○ Vaccine manufacturing facilities are inspected and given approval ○ Every new lot of vaccines produced has to be cleared by before approval to sell in Canada. ○ The government and public health continuously monitor vaccines after they have been approved to detect any previously unrecognized safety concerns
Aren’t pharmaceutical companies recommending these vaccines?	<ul style="list-style-type: none"> • Experts in paediatrics, infectious diseases, immunology, medical microbiology, internal medicine, epidemiology and public health participate in Canada’s National Advisory Committee on Immunization (NACI)

	<ul style="list-style-type: none">• NACI and similar provincial/territorial committees make these recommendations based on diseases occurring in Canada and use of current vaccines and new vaccines as they become available• Pharmaceutical companies are not allowed to make recommendations on which vaccines Canadian should receive
Do we regular check to make sure vaccines are safe?	<ul style="list-style-type: none">• Safety is a top priority for vaccines, since they are an intervention that is normally given to healthy people• The vaccines used in Canada are extremely safe. Vaccines are among the safest medical products available. Serious side effects, such as severe allergic reactions, are very rare.• Before authorization for use in Canada, vaccines are extensively tested for safety and efficacy.• Health Canada supervises all aspects of vaccine production by manufacturers. Safety continues to be rigorously monitored and evaluated after the vaccine is on the market.• All adverse effects following immunization (AEFI) are reviewed for potential causal relationships with vaccines• IMPACT is an active surveillance network designed to actively screen for serious vaccine-related issues in children• A summary of the vaccine safety system can be found at:<ul style="list-style-type: none">○ Canada's eight-component vaccine safety system: A primer for health care workers