

APPENDICES

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Appendix 14.1: Glossary

A

Abscess - A localized collection of pus caused by infection.

Acellular vaccines - Vaccines containing partial cellular material as opposed to complete cells. These vaccines are as effective as whole cell vaccines but do not produce the common side effects.

Acquired immunity - See adaptive immunity.

Active immunity - The production of antibodies against a specific disease by the immune system, acquired by either contracting the disease or through vaccination.

Active immunizing agent - Any substance or organism that provokes an immune response (produces immunity) when introduced into the body.

Active surveillance - An active case-finding based on a regular review of hospital admission records. Canada's pediatric active surveillance system for serious adverse events following immunization, vaccination failures, and selected infectious diseases is called Immunization Monitoring Program – Active IMPACT).

Adaptive immunity - The body's second line of defence which becomes active when innate immune defences are overcome. It has three key features: **specificity, memory and diversity**; its mechanisms depend on the ability of the immune system to recognize "non-self" material, to respond to its presence and to dispose of it appropriately.

Additive - The substances added to vaccines to inactivate a virus or bacteria, stabilize the vaccine, or preserve the vaccine so that it remains potent over time (e.g., albumin, aluminum hydroxide, and aluminum phosphate).

Adjuvant - A substance added to the vaccine preparation, which enhances or modifies the antibody response (intensity and/or duration) to the antigen.

Adsorbed vaccine - A vaccine containing an adjuvant to assist in the retention of the antigen at the injection site and enhance the immune response by degree or duration.

Adult - those 18 years of age and older.

Adverse event following immunization (AEFI) - An undesirable experience or any unexpected medical occurrence in a patient occurring after immunization. Although a temporal relationship exists, a causal relationship is not necessarily established with the treatment or vaccine. The AEFIs are classified as being rare, uncommon, common, or very common. See serious adverse event.

Adverse vaccine reaction - Any unexpected or dangerous reaction or unwanted effect caused by the administration of a vaccine. The adverse reaction may occur suddenly, or develop over time. See serious adverse event

Allergens - An antigen causing an allergic or hypersensitive response. Allergens induce the formation of IgE antibodies, a class of antibodies involved in all types of allergic reactions.

Anamnestic Response - Also called memory response; a renewed rapid production of an antibody on the second (or subsequent) encounter with the same antigen.

Anaphylaxis - An immediate and severe allergic response. The cardinal features of anaphylaxis as outlined in the Canadian Immunization Guide (pp. 80-84, 7th ed.) are: itchy urticarial rash in 90% of cases; angioedema (progressive painful swelling) of face and mouth; respiratory symptoms (sneeze, cough, wheeze, dyspnea, laboured breathing); hypotension (can progress to collapse and shock).

Antibody - A protein found in the blood that is produced in response to foreign substances, (e.g., bacteria or viruses invading the body). Antibodies protect the body from disease by binding to these organisms and destroying them.



Antibody affinity - A measure of the binding strength between the epitope of the antigen and the binding site of the antibody.

Antibody avidity - The functional combining strength of an antibody with its antigen; avidity is related to both the binding affinity between epitope-antibody complex and to the structure (binding valencies) of the antibody; avidity binding can be illustrated by the strength of binding that can result from the multiple hooks and piles found in Velcro clothing fasteners.

Antibody classes - There are five classes of antibodies that differ by their structure and functions:

- **IgM**, the first class of antibody produced following primary immune stimulation; it is of lower affinity than IgG antibodies; IgM class antibodies do not cross the placenta;
- **IgG**, the second class of antibody to be produced following immune induction, IgG production is a result of antibody class “switching” or maturation of the humoral immune response; IgG antibodies have higher affinity binding for their specific antigens;
- **Ig**, exists in two different forms:
 - Secretory form: Found in the mucosal linings and is important for protection against pathogen entry and spreading; and
 - Serum form: Found in blood circulation and is important for protecting against systemic infection;
- **IgA**, have no opsonic antibacterial activity;
- **IgE**, a class of antibody involved in all types of allergic reactions; and
- **IgD**, a class of antibody found on most B cells but as of yet no clearly defined role.

Antibody production, plasma cells - The differentiated form of B cells that produce antibody.

Antibody subclass - Within some antibody classes there exist subclasses of antibodies, IgG1 and IgG2 are two examples; IgG1 have a better bactericidal activity than do IgG2.

Antigen - A foreign substance, usually a protein, which is capable of inducing an adaptive immune response when introduced into the body. In some rare circumstances they can be self-proteins that induce an autoimmune response.

Antigen, epitope - The parts of the antigen that make contact with the antigen binding site of the antibody or T cell receptor.

Antigen presentation - The process by which certain cells in the body (antigen presenting cells) express antigen on their cell surface in a form recognizable by lymphocytes.

Antigen presenting cell (APC) - Highly specialized cells that are capable of converting/presenting antigen to lymphocytes and display their peptide fragments on their surface to stimulate the immune response.

Antigen processing - The conversion of an antigen into a form in which can be recognized by lymphocytes.

Antigenic determinant - That part of an antigenic molecule against which a particular immune response is directed.

Antigenic drift - Mutation resulting in a small change in antigen structure.

Antigenic shift - Mutation resulting in a large change in antigen structure.

Antitoxin - A solution of antibodies derived from the serum of animals immunized with specific antigens and used for treatment.

Anxiety (or panic) attack - A sudden, unexpected period of intense anxiety often accompanied by symptoms such as heart palpitations, dizziness, trouble breathing, and intense fear of dying.

Arthus reaction - Localized inflammatory response, usually observed in the skin.



Assays

- **ELISA** (Enzyme Linked ImmunoSorbent Assay)—an extremely sensitive, fast, easy-to-use and inexpensive assay used to measure either antibody or antigen levels without the use of radioactivity.
- **RIA** (RadioImmune Assay) is also used to measure titres of antigen-specific antibodies found in the blood; differs from the ELISA assay in that it uses radio isotope tagged molecules for detection purposes.
- Lymphocyte stimulation test. This assay measures antigen-specific lymphocyte proliferation and so is a measure of cell mediated immunity or T cell priming; levels of IL-5 and IFN- γ can be measured on the same samples to determine if the T cell response is predominantly Th2 or Th1, respectively; these assays are used in research and not in diagnostic labs for routine analysis, and are furthermore expensive and difficult to perform.

Aseptic technique - A set of practices and procedures performed under sterile conditions in order to prevent the introduction of micro-organisms, such as fungi, bacteria, and viruses.

Assent - The agreement of a person to allow diagnosis or treatment when the client does not have the capacity or legal empowerment to give informed consent, such as a child or cognitively impaired adult.

Authority - The right of an individual to make health care decisions (e.g., consent for vaccine series) on their own behalf or for another individual. This may be a formal or informal agreement.

Attenuated vaccine - Vaccine in which a live virus or bacteria is weakened through chemical or physical processes in order to produce an immune response without causing the severe effects of the disease.

Autoimmunity - An immune response made against one's own antigens.

B

Bar coding - A method for encoding data using narrow and wide bars and spaces that represent a number or alphanumeric character. Bar coding allows for fast and accurate electronic readability. Bar codes are printed or stamped on products, labels, or other media.

Benefit - The advantage or improvement in condition provided to an individual or a population.

B-lymphocyte (B-cell) - A class of lymphocyte so called because they originate and mature in the bone marrow before being released into the bloodstream. B-cells are involved primarily in antibody-mediated immunity and produce antibodies.

Booster - A second, third, or greater immunization with a specific vaccine that may be necessary to insure that the individual is protected against the infectious disease.

Breakthrough disease - A person develops a vaccine-preventable disease even though they have been immunized and their immune system has responded to the vaccine. Breakthrough cases in vaccinated persons tend to be less serious than disease in unvaccinated persons.

C

Capability - The ability to understand the Standard Information contained in vaccine-specific Saskatchewan immunization fact sheets.

Carriage - The presence of a potentially disease-causing micro-organism in an individual's body that does not cause the disease in the carrier but may cause others to become infected.

Carrier protein - Protein linked with a small molecule (hapten) to increase the hapten's ability to induce an immune response.

Causality - The relationship between a cause and its effects. An effect, such as a disease, may have one or many causes, such as risk factors, predisposing factors, or precipitating factors (e.g., heart disease is caused by a combination of factors including genetic and behavioural factors).



CD markers - Cell surface molecules of lymphocytes that are distinguishable and may be used to differentiate cell populations (e.g., CD4 cells = Th cells and CD8 cells = CTLs).

Cell line - Cells which can be cloned and propagated indefinitely in tissue culture.

Cell-mediated immune (CMI) response - A term used to describe immune reactions that are mediated by cells (e.g. CTL cells) rather than by antibody or other humoral factors (e.g. complement proteins); see T-helper cells.

Cell-mediated immunity (CMI) - The immune reactions that are mediated by cells, cytotoxic T lymphocytes (CTL cells) rather than by antibody or other humoral factors (e.g., complement proteins).

Cellulitis - An infection of the skin and connective tissue characterized by redness, swelling, warmth, and tenderness. May also cause fever or chills.

Child/Infant/Minor - Anyone under the age of 18 years.

Client - A person in the client index or registry. May be a contact, case, control, immunization recipient or other (e.g., guardian of a client).

Clinical features - The symptoms that are based on direct observation of the patient.

Class switching - The process by which an individual B cell can link immunoglobulin genes to produce a different of class of antibody with the same antigenic specificity; this process is also reflected in the class switch from IgM to IgG that is seen during the maturation of an immune response.

Clonal expansion/proliferation - When an antigen stimulates a specific lymphocyte, clones or identical daughter cells of the lymphocyte are produced; the production of these clones is known as clonal proliferation or expansion.

Cold chain - An unbroken series of storage and distribution activities that maintains a proper temperature range during storage and handling in order to preserve the potency of the vaccine.

Combination vaccine - A single vaccine that includes antigens for the prevention of several different diseases, or that protects against several strains of a single infectious agent that causes the same disease such as the measles, mumps, and rubella (MMR) vaccine.

Communicability - The capability to spread disease from person to person, or from species to species. Also referred to as being infectious.

Community/herd immunity - A large percentage of the population is vaccinated in order to prevent the spread of certain infectious diseases. Even individuals not vaccinated (such as newborns and those with chronic illnesses) are offered some protection because the disease has little opportunity to spread within the community. Also known as "herd immunity."

Complement - A group of serum proteins, which can be activated by antibody-antigen complexes or by pathogens; activation of the complement proteins helps eliminate pathogens by directly causing their lysis or by promoting phagocytosis.

Complications - A new disease or medical condition that develops during the treatment or course of an existing disease or medical condition.

Confidentiality - To protect personal information from disclosure to unauthorized individuals.

Conjugate polysaccharide vaccine - A vaccine in which the polysaccharide is chemically combined with a protein molecule to increase efficacy and immunogenicity (e.g., Hib, pneumococcal, and meningococcal conjugate vaccines).

Confidentiality - In medicine, confidentiality refers to the right of the patient to have personal identifiable, medical information revealed to a healthcare professional remain private. Limits are placed on how and when such information may be disclosed to a third party.



Conflict of interest (real or perceived) - A situation where an individual or the organization that they represent has competing professional or personal interest that may make it difficult for them to fulfill their duties in an impartial manner. A conflict of interest may be real or perceived.

Contagiousness - The degree of transmissibility - ability for a disease to be transmitted from person to person through direct or indirect contact with a bodily discharge of such a patient, or with an object touched by such a patient or by bodily discharges.

Contraindication - A symptom or condition that makes it likely a serious adverse event or life-threatening problem would occur if a vaccine is given. In Canada, the only contraindication applicable to all vaccines is a history of an anaphylactic reaction to a previous dose of vaccine or to a vaccine component. Severe immunosuppression and pregnancy are contraindications to live vaccines only.

Coverage rate (immunization coverage) - The proportion of the target populations that has been vaccinated through the publicly funded programs that provides certain vaccines at little or no cost.

Credible sources - The clinical trials, academic studies, or other health-related sources of information that are based on scientific evidence. Credible studies or trials should be conducted by qualified scientists or other health professionals.

Cytokines - Any of several regulatory proteins, such as the interleukins, that are released by cells of the immune system, and act as intercellular mediators (signal other cells) of the immune system.

Cytopathic - Of or relating to degeneration or disease of cells.

Cytotoxic T lymphocyte (CTL) - Subset of T-cells that are responsible for the destruction of host cells that have become infected with viruses or other intracellular pathogens; they recognize and bind to antigens on the surface of infected cells; CTLs normally carry the CD8 surface and can kill virally infected target cells expressing antigenic peptides presented by MHC Class I proteins.

D

Dendritic cells - Phagocytic cells found in most tissues. They act as antigen presenting cells (APC), travel to lymph nodes and present antigens to T cells.

Determinants of health - The various factors that when combined together contribute to the overall health status of an individual or population. These include income, educational level, healthcare access, genetics, and lifestyle.

Disclosure - The release, transfer, or provision of access to, or divulging of individually identifiable health information outside of the entity holding that information.

DNA vaccine - A vaccine consisting of naked DNA that is administered to the vaccinee; the vaccinees enzymatic cell machinery then produces the antigenic protein(s) to induce the active immune response.

E

Early induced response - An innate response to an antigen, which involves inflammation and requires protein synthesis. It is not antigen specific.

Effectiveness - The ability of a vaccine to produce the desired beneficial effect(s) to populations under real-world circumstances.

Effector cell - An activated cell, which participates in antigen elimination.

Efficacy - The maximum ability of a vaccine to produce a desired effect.

ELISA - Enzyme-Linked ImmunoSorbent Assay detects antigen-antibody binding using antibody complexes with an enzyme that forms a coloured product from a colorless substrate.

Encephalitis - The inflammation of the brain caused by a virus; encephalitis can result in permanent brain damage or death.



Encephalopathy - A general term describing brain dysfunction such as encephalitis, meningitis, seizures and head trauma.

Encounter - A point of service for any type of subject that is defined by date, time, location and the type of activity (e.g., immunization, disease screening or lab results). An encounter may or may not be associated with an investigation/control record within a subject record. An encounter may or may not be associated with other encounters through an episode.

Endemic - The continual, low-level presence of disease in a community.

Epidemic - The occurrence of disease within a specific geographical area or population that is in excess of what is normally expected.

Epidemiology - A branch of medical science that deals with the incidence, distribution, and control of disease in a population. The sum of the factors controlling the presence or absence of a disease or pathogen.

Epidemiological triangle - A model for the causation of disease that involves three elements: agent, host, and environment.

Episode - A descriptive group of one or more encounters. An investigation may have zero to many episodes. Encounters not associated to an investigation or control can also be grouped into one or more episodes. An episode is named by the user or the system and is defined by a start date and (optionally) and end date.

Epitope - The site of an antigen to which the T-cell or B-cell receptor and antibody responds and binds.

Evidence-based decision making - The decisions that are based on a careful analysis of accurate data and proven research findings.

Excipients - Inactive ingredients that are necessary for production of a finished pharmaceutical formulation. Adjuvants, preservatives, and other additives are excipients, essential components of vaccines.

Expired stock - All vaccines and diluents have an expiration date by which they should be used printed on their vials and boxes. Products that are passed their expiration dates are considered expired stock and should not be administered.

Expiry date - The date by which a vaccine or a diluent should be used.

F

Fever - An increase in body temperature above normal (37°C).

Follicle - In immunology, an area of the spleen or lymph node occupied by B cells and dendritic cells.

G

Gamma globulin - Fraction of serum, which contains most antibody molecules.

Genetic restriction - The term used to describe the observation that lymphocytes and antigen presenting cells cooperate most effectively when they share the same class of surface marker proteins; MHC surface markers exist as Class I and Class II proteins.

Geometric mean titre (GMT) - A measure of central tendency for antibody response; a statistical formula to determine the average value of antibody levels within a group of individuals where often wide variations in individual responses to vaccination occur; to calculate a geometric mean titre, the common logarithm (base 10) of each antibody titre is determined, the mean of these log values is calculated, and then the antilogarithm of the mean is determined; geometric mean "concentration (GMC)" is sometimes used in place of GMT for situations when antibody levels are reported in nonstandardized units of measure (e.g., mg/l) $GMT = \text{antilog } \Sigma \text{ logs of individual titres number of vaccinees.}$



Guillain-Barré syndrome - A rare neurological disease that occurs when the body's immune system attacks the peripheral nerves in the body, causing loss of reflexes and temporary paralysis. Symptoms include weakness, numbness, tingling and increased sensitivity that spreads over the body.

H

Hard-to-reach (individuals, groups, populations) - The individuals, groups, or populations that have the greatest difficulty accessing services (e.g., the disadvantaged, minorities, residents in remote communities).

Harm - The nature and extent of damage that could be caused by a vaccine.

Hapten - A small molecule which is immunogenic only when covalently linked to a carrier molecule.

Helper T-cell - A subset of T-cells that help generate cytotoxic T-cells in the cell-mediated immune response, and also stimulate with B-cells to differentiate and produce antibodies in the antibody mediated immune response.

Herd immunity - Having a large percentage of the population vaccinated in order to prevent the spread of certain infectious diseases. Even individuals not vaccinated (such as newborns and those with chronic illnesses) are offered some protection because the disease has little opportunity to spread within the community.

Histamine - Molecules in mast cells which, when released, dilate blood vessels and cause smooth muscle to contract.

Host - A person or other living organism that can be infected by an infectious agent under natural conditions.

Humoral immunity - The term humoral refers to the extracellular fluids such as serum and lymph; in this case the immune response is mediated by antibodies produced by B-cells as effector molecules. Both B- and T-cells may be involved in this response.

Humoral-mediated immune response - "Humoral" refers to the extracellular fluids such as serum and lymph, and in this case the immune response is mediated by B cell-produced antibodies as effector molecules; remember that both B and T cells may be involved in this response.

Hyperimmune Globulin - Special preparations from selected donor pools of blood plasma containing high antibody content against a specific antigen i.e. hepatitis B immune globulin (HBIG), varicella zoster immune globulin (VZIG), rabies immune globulin (RIG) and tetanus immune globulin (TIG).

Hypersensitivity - An undesirable immune response which is directed against an antigen. Hypersensitivity reactions require a pre-sensitized state of the host.

Hyporesponder - There is high variation in individual immune responses to vaccination and not all people respond equally well; it is known for example with hepatitis B vaccination that certain risk factors (male gender, persons who are obese, who smoke, or are over 40 y/o) enhance the potential of a poor anti-HBsAg antibody response; similarly individuals who have an impaired immune system may respond poorly; hyporesponders are characterized by having measurable levels of anti-HBsAg antibodies that are less than protective following primary vaccination (and in the case of hepatitis B vaccination most hyporesponders will achieve seroprotective levels simply after receiving additional vaccine doses).

Hypotonic-hyporesponsive episode (HHE) - A serious adverse reaction to immunization that results in a decreased level of responsiveness, muscle tone and activity, and pallor. HHE is most commonly reported in response to administration of the whole-cell pertussis vaccine, but also occur with a lower frequency after tetanus-diphtheria (Td) and tetanus-diphtheria-acellular pertussis (Tdap) immunization.



I

Immune - A state of being protected against infectious diseases by either specific or non-specific mechanisms (i.e., immunization, previous natural infection, inoculation, or transfer of protective antibodies); for certain diseases, immune mothers may temporarily transfer protective antibodies to their newborns in utero providing protection for up to 6 months.

Immune complex - The product of an antigen-antibody reaction or binding, the complex may contain proteins of the complement system.

Immune deficiency - Congenital or acquired inability of the immune system to function correctly.

Immune response - Alteration in the reactivity of an organism's immune system in response to an antigen. This may involve antibody production, induction of cell-mediated immunity or activation of the complement proteins.

Immune system - The body's very complex system (made of many organs and cells), which defends the body against infection, disease, and foreign substances.

Immunity - The protection against a disease. There are several types of immunity: passive, active and humoral. The immunity is indicated by the presence of antibodies in the blood and can usually be determined with a laboratory test.

Immunity, T-cell dependent - Antigen-specific immunity induced through the cooperation of T and B cells which results in a high quality antibody response with antibody class switching from IgM to IgG, and the formation of memory B and memory T cells.

Immunization - Is an inclusive term denoting the process of inducing or providing immunity artificially by administering an immunologically active product; immunization may be passive or active-passive immunization denotes the provision of temporary immunity by the administration of preformed antitoxin or antibodies (e.g., pooled human Ig or specific Ig preparations)-active immunization denotes the induction of antibody-mediated and/or cell-mediated immunity by the administration of an antigen, such as a vaccine; a process or procedure that increases an organism's reaction to antigens, thereby improving its ability to resist or overcome infection.

Immunization record (professional chart and take home) - A record of all immunization a person has received. A record is kept by the healthcare provider who gave the immunization (professional chart), and in a local or provincial registry and by the individual or their parent or guardian (take-home record).

Immunization registry - A tool to consolidate immunization records from multiple sources, including any reports of adverse events, into one confidential record.

Immunization schedules (delay, interruption, etc.) - They outline the optimum timing of primary and secondary immunizations. A delayed immunization schedule may be used when a child receives his or her primary or secondary immunizations after their commended ages of their regional immunization schedule. When a child's vaccinations are interrupted by more than a month, an accelerated or catch-up immunization schedule should be used.

Immunization status - A client's immunization status conveys whether they are eligible, due or overdue for a specified vaccine.

- **Eligible:** The earliest acceptable time period during which an immunization is considered a valid dose for immunization coverage reporting;
- **Due:** The time period during which an immunization is considered up to date according to the NACI schedule; and
- **Overdue:** This time period is one month after an individual is due for an immunization, unless otherwise specified.



Immunizing agent - The term used to describe the different agent combinations used for immunization. These agents can be monovalent (single antigen) or multivalent (multiple antigens e.g., MMR) vaccines. The term “vaccine” can be used interchangeably with immunizing agent.

Immunogen - Any molecule which can produce an immune response.

Immunogenicity - The inherent ability of an antigen to induce a humoral and/or cell-mediated immune response; for practical purposes the antibody-mediated response is most often used to measure the immunogenicity of vaccines.

Immunogenicity measures - See GMT, protective efficacy, seroconversion, seroconversion rate, serological correlate for protection, seroprotection, seroprotection rate.

Immunoglobulin - A class of antibodies found in the fraction of plasma proteins called gammaglobulins and because of their role in immunity they are also referred to as immunoglobulins; abbreviated as Ig; a specific protein substance, produced by plasma cells to help fight infection.

Immunological memory - Immune memory is mediated by cells of the immune system; memory cells can include B cells, T cells, and CTL cells.

Immunoprophylaxis - Disease prevention by immunologic means. Active immunoprophylaxis involves the administration of vaccines to stimulate the host’s own immune system. Passive immunoprophylaxis involves the administration of immune globulins from an immune donor

Immunosuppressed - When the immune system is unable to protect the body from disease. This condition can be caused by diseases (e.g. HIV infection or cancer) or by some drugs such as those used in chemotherapy. Also known as immunocompromised.

Imported - To bring or carry in micro-organisms, such as viruses and bacteria, from an outside source.

Inactivated vaccine - A vaccine made from an infectious agent that has been inactivated or killed (without affecting the antigenicity) that allows for an active immunization.

Innate immunity - Protective mechanisms we are born with e.g., cilia, skin, and mucosal membranes.

Incidence - The number of new disease cases reported in a population over a certain period of time.

Incubation period - The period between the first exposure to a pathogen and the appearance of signs or symptoms of disease; normally bacterial incubation periods are short (hours to days) compared to virus incubation periods (weeks to months).

Induration - A hardening of soft tissue caused by inflammation. It is often a sign of infection; affected skin and other soft tissue may be red, thickened, and tender.

Infant - Birth up the age of 12 months.

Inflammatory response - Is a non-specific defence mechanism elicited by tissue damage. It is generally characterized by four basic signs or symptoms: redness, pain, heat, and swelling. It contributes to the elimination of micro-organisms, toxins, and other foreign particles at the site of the injury, prevents their propagation to adjacent tissues, and prepares the site for tissue repair.

Informed decision making (consent) for immunization and registry - A legal term related to educating patients about the benefits, risks, and alternatives of therapeutic treatment. The patient, or a parent or guardian, must understand the potential risks and benefits of the treatment (or refusing treatment) before making a decision. The informed consent insures that the patient also understands the importance and benefit of the immunization registries.

Injection error - An error made either in the substance injected into a patient or in the location of the injection into the patient resulting in harm.

Injection site - The anatomical location of injection (e.g., left deltoid, right leg).

Injection site reaction - The inflammation or damage to the tissue surrounding the injection site.



Innate immunity - The body's first line of defence against pathogens involving a set of disease resistant mechanisms, present from birth, which are described as non-specific. It includes physical (e.g., cilia, skin, and mucosal membranes) and chemical barriers (e.g., tears) to infection as well as natural killer cells and phagocytes.

Interference - This term has several applications in vaccinology, for example:

- It refers to the potential of maternal antibodies, or Ig administrations, to interfere with the ability of live-attenuated virus vaccines to induce a good immune response;
- Because live-attenuated viruses multiply at different rates, some vaccine virus strains can;
- initiate a non-specific immune response that interferes with the "take" or immune induction by accompanying vaccine virus strains-this is the case for the polio Sabin type 2 virus and is the reason several doses of polio Sabin must be given; and
- "Antigen interference" refers to the interference in antibody levels that results following the administration of combined antigens (e.g., Hib interference in DTPaP-based combinations-although Hib induces lower titres, the Hepatitis B component induces higher titres).

Interferon - A group of antiviral cytokines involved with cell-to-cell communication of the immune system and are known to control viral infections; IFN-gamma (γ) is important also for differentiation of Th cells to the Th1 cell response; in this context IFN- γ levels can be measured to determine if an immune response is primarily a Th1- type response.

Interleukin - One of a group of proteins that serve as immunologic messengers between immune cells; IL-5 levels can be measured to determine if an immune response is primarily a Th2-type response.

Intramuscular injection - Injection of a biological product into muscular tissue.

Intradermal injection - Injection of a biological product just under the dermis.

Intranasal administration – Administration of a biological product into a nasal cavity.

J

K

Killed vaccine - A vaccine composed of inactivated or killed pathogens.

L

Leukocyte (white blood cells) - Cells of the immune system, which defend the body against foreign pathogens. They are produced in the bone marrow and include neutrophils, eosinophils, and lymphocytes.

Live attenuated vaccine - the vaccine contains whole, living bacteria or viruses that induce immunity by actively replicating within the host. Attenuated means the vaccine strains are weakened so infection is usually unapparent or very mild.

Local reaction - A limited reaction that occurs at the point of entrance of an infecting organism or of an injection. Also known as an injection site reaction.

Lot number - The number specific to a particular lot of a vaccine that allows it to be identified.

Lymph - Extracellular fluid that accumulates in tissues and is carried through the lymphatic system by the lymphatic vessels.

Lymphatic - Vessels which transport lymphocytes and leukocytes in and out of the lymph nodes and back into the circulatory system.

Lymphocyte - Leukocyte which has specific receptors for antigen and participates in adaptive immunity.



Lymph node - Collections of lymphoid tissue located throughout the body. Antigen is taken to the lymph nodes and lymphocytes are activated there.

Lysis - Process of disintegration or dissolution of cells

M

Macrophage - Large phagocytic cell of mammalian tissues; macrophages play an important role in destroying some bacteria by phagocytosis; they create inflammation cytokines, release substances that stimulate cells of the immune system and acts as an antigen presenting cell (APC).

Major histocompatibility complex (MHC) - A set of protein products found on the surface of almost all cells in the body (except RBCs) and help to function in signalling between lymphocytes and cells presenting antigen; MHC surface marker proteins exist as Class I and Class II.

Maternal antibodies - Antibodies generated by the mother and passed to the fetus during pregnancy. Only IgG class antibodies are capable of crossing the placenta. Maternal antibodies can persist in the neonate for months, the precise length of duration depends on the starting concentration; maternal antibodies are also transferred to the infant through breast milk and provide limited local immunity at mucosal surfaces in the gastrointestinal and upper respiratory tract.

Mature Minor - A person under the age of 18 years who is capable of providing informed consent to his or her own health care.

Medical conditions - A usually defective state of health or unusual condition.

Medication error - Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional or patient. This may also be referred to as a preventable adverse drug event.

Medicolegal - This term pertains to the legal aspects of practicing medicine (e.g., informed consent and malpractice).

Memory cell - Lymphocytes that mediate immunological memory. Memory T-cells are formed from activated T-cells and memory B-cells are formed from activated B-cells; they are long-lived cells that persist in the blood and lymphoid tissues; they keep the body prepared to mount a rapid response against the specific pathogen that stimulated their formation; memory B, T, and CTL cells have already been primed with a specific antigen, but have not terminally differentiated into effector cells; they react more quickly than unstimulated lymphocytes when restimulated with the same antigen on secondary immune stimulation.

Memory response (secondary immune response) - The capacity of the body's immune system to remember an encounter with a specific antigen and to react more swiftly to the antigen in a later encounter.

Minimum vaccine intervals - The minimum amount of time that must pass before the next dose of the same vaccine is administered in order to ensure that the immune system has time to respond effectively to the first dose.

Min-Max thermometers - A thermometer that displays the current temperature and the minimum and maximum temperatures reached since the reset. It may include an alarm to indicate when a certain temperature threshold has been exceeded.

Mode of transmission - The mechanisms by which an infectious agent is spread to humans, including direct (skin-to-skin) and indirect (airborne, vector-borne, etc.) methods.

Molecule - A stable, electrically neutral group of at least 2 atoms held together by chemical bonding.



Molecular mimicry - This occurs when a foreign antigen, that is similar in structure to a self antigen, becomes recognized by the immune system and thereby breaks tolerance to the antigen and induces an autoimmune response.

Morbidity - A diseased state or symptom - the incidence of disease; the rate of sickness (as in a specified community or group).

Mortality - The level (rate) of death in a community. Usually the cause (a specific disease, a condition or an injury) is stated.

N

National Immunization Strategy - A comprehensive strategy to enable collaboration among levels of government to improve the effectiveness and efficiency of immunization programs across Canada.

National Vaccine Storage and Handling Guidelines for Immunization Providers - These recommendations on vaccine storage and handling for healthcare providers were developed in collaboration with the Canadian Nursing Coalition for Immunization and published by the Public Health Agency of Canada.

Natural infection - An infection or disease caused by bacteria or viruses found in the natural environment, such as measles or chicken pox.

Needle length and gauge - The needle length refers to the length of the needle's barrel, while the needle gauge refers to the width or barrel size of the needle.

Needle stick injury - The injury caused by a needle puncture to the skin. The needle stick injuries can transmit infectious diseases, especially blood-borne viruses. They are a hazard for people who work with hypodermic needles and other needle equipment.

Neutralization - The process of antibody binding to its target antigen and neutralizing its pathogenic effect (e.g. tetanus Ig binding to tetanus toxoid); also the name of a method used to measure sample antibody levels produced in response to an antigen as used to assess the immunogenicity of a vaccine; the method relies on the formation of antigen-antibody complexes and cytopathic cell changes; the highest dilution that completely neutralizes the antigen gives a measure of the antibody concentration in the sample.

Neutrophil - One of the most common circulating granulocytes (white blood cells), involved in phagocytosis of killing of bacteria.

Natural killer (NK) cell - Natural killer cells are lymphocytes which are involved in antibody-dependent cell-mediated cytotoxicity (ADCC); here the antibody provides a link which binds the antigen to a natural killer cell or other kind of cytotoxic T-cell; a group of lymphocytes that have the innate ability to destroy some virally-infected cells; "innate", meaning NOT antigen-specific, or not induced by the "adaptive" immune response.

Nodule at injection site - A lump, swelling, or mass at the injection site.

Nonresponder - An individual vaccinee that does not seroconvert following primary vaccination; e.g. genetic restriction is thought to prevent a small percentage of the population from processing some recombinant vaccine antigens, unlike hyporesponders, these individuals are unable to respond to vaccination regardless of the number of doses given.

Notices of compliance (NOC) - The Notices of Compliance are issued to a manufacturer following the satisfactory review of a submission to Health Canada. NOCs indicate that a manufacturer has complied with sections C.08.002 or C.08.003 and C.08.005.1 of the Food and Drug Regulations.



O

Occupational risk groups - The people who work in specific careers that expose them to a greater proportion of risk or harm.

Oculorespiratory syndrome - A syndrome of bilateral red eyes and upper respiratory symptoms, including coughing, wheezing, chest discomfort, sore throat, and, occasionally, facial swelling, following influenza vaccination. It is usually transient.

Oponisation - The process of combining an antigen with its corresponding antibody making the antigen more susceptible to attack and destruction by phagocytic cells.

P

Package inserts - The information that comes with the vaccine and is written in simple language intended for the public. The insert may contain, among other things, information on the proper use of the vaccine, a short description of the disease(s) it protects from, and storage and dosage instructions. It may also list warnings, precautions, interactions and possible side effects. Instructions and contact information on what to do if serious suspected side effects occur may also be provided.

Pandemic - This term denotes a disease affecting or attacking the population of an extensive region, as when the distribution of an epidemic disease spreads around the world (e.g., flu pandemics).

Passive immunity - The protection against disease through antibodies that were produced by another person or animal that are injected or transfused into an individual who receives Passive immunity is effective, but protection is generally limited and diminishes over time (usually a few weeks or months). For example, maternal antibodies are passed to the infant prior to birth. These antibodies protect the baby for the first 4-6 months of life.

Passive immunizing agent - A substance or organism that provides immunity for the period of time it remains within the body. A passive immunizing agent may be acquired through the transfer of antibodies from another person or animal, from mother to fetus, or through inoculation.

Passive surveillance - A system of surveillance where the responsible agency relies on mandatory reporting by front-line healthcare providers or agencies, and the responsible agency does not carry out activities designed to stimulate reporting, such as inspections of facilities or telephone calls to healthcare providers.

Pathogen - Disease causing organism.

Phagocytes - Cells which engulf particles such as bacteria and viruses. Macrophages and neutrophils are the principle phagocytes of the immune system.

Phagocytosis - The process by which cells engulf and digest antigens and enclose them within a vacuole (phagosome) in the cytoplasm; macrophages and dendritic cells use this mechanism to process and breakdown antigens into smaller epitopes for presentation to T-helper cells.

Phase I vaccine study - A clinical trial involving a small number of healthy persons which is used to determine if a vaccine can be safely administered to humans and the vaccine will elicit an immune response in the study participants.

Phase II vaccine study - A clinical trial involving a larger number of healthy persons which is used to determine the appropriate dose and schedule for administering the vaccine, and to assess the vaccines' effectiveness in preventing disease.

Phase III vaccine study - A clinical trial involving thousands of people which is used to demonstrate the safety and efficacy of a vaccine in a large, diverse population.

Plasma - The fluid part of blood, containing all proteins



Plasma cell - Specialized B cells that producing and secreting antibodies when they are stimulated by a specific antigen.

Polysaccharide - The long chains of sugar molecules that resemble the surface of certain types of bacteria. Polysaccharide vaccines are available for pneumococcal disease, meningococcal disease and Haemophilus Influenzae type B. They are recommended for outbreak control, for the protection of persons travelling to locations with epidemic disease attributable to vaccine serogroups, and for persons who may be at increased risk of meningococcal disease. Polysaccharide vaccines are not recommended for routine childhood immunization.

Population health prevalence -The measure of disease presence which can vary depending on the interval of time studied. "Point prevalence" refers to the presence of the disease at a given point in time (i.e. a "snapshot"). It is the number of existing cases found in a cross-sectional survey. "Period prevalence," a less common term, refers to the number of disease cases (new and existing) within a population over a given time period.

Post-marketing surveillance - The surveillance of a vaccine that is carried out after the vaccine has been approved for sale to the general public. Post-marketing surveillance allows for the identification of rare adverse events that may only occur at a rate of 1:10,000, or 1:1,000,000 of vaccine doses given. It also allows regulators to ensure that the vaccine retains its characteristics from one lot to the next over time.

Potency - The power of medicinal agents to produce the desired effects.

Precautions - It refers to a condition that may increase the chance of an adverse reaction following immunization or that may compromise the ability of the vaccine to produce immunity. Depending on the circumstances, the vaccine may still be administered after careful consideration as to whether the potential benefits outweigh the potential harm.

Prejudice - Injury or damage resulting from some judgment or action in disregard of one's rights.

Preschooler - Age 3 to the age of 5 years.

Preservatives - Chemical additives used to prevent bacterial and fungal contamination in vaccines.

Prevention and health promotion - The actions and measures that reduce exposure or other risks, keep people from getting sick, or keep disease from getting worse.

Primary immune response - The response by the immune system when it encounters an antigen for the first time. Primary immune responses are primarily composed of IgM antibodies and produce immunologic memory.

Primary immunization - A preliminary vaccination or series of vaccinations which are required to prime the immune system to a specific antigen so that on subsequent exposure to the same antigen, a boosting effect or rapid and important expansion of memory cells will occur.

Primary prevention - The prevention that is focused on encouraging good nutrition, physical fitness, and immunization among the general population. It promotes good health, which reduces the likelihood of disease occurring.

Privacy - The right of the individual to keep their personal and health information free from unauthorized disclosure by healthcare providers.

Product monograph - A description of the name, chemical formula, and uniform method for determining the strength and purity of a drug.

Protective level or protective efficacy - It represents the percentage of vaccinated individuals protected against disease when compared to an unvaccinated group (absolute efficacy) having the same risk of disease exposure over the same period of time, or a group that has received a comparative vaccine (relative efficacy).



Protein conjugate - A compound that is composed of a protein molecule and a non-protein prosthetic group.

Protocol - A predefined set of drugs (and the associated standard Rx data) used to treat a subject as part of a complete treatment plan. Predetermined drug protocols prevent the user from having to enter multiple drugs, and all of their associated details, when creating a prescription by pre-populating this information when selected. A drug protocol may be made up of a number of standard Rx records (previously called “regimen”).

Pure polysaccharide vaccine - A vaccine produced from the polysaccharide (sugar) coating of an encapsulated bacterium (e.g., pneumococcal and meningococcal polysaccharide vaccines). **Provider** - A professional who provides health services (e.g., a public health nurse).

Purified protein - A protein that has been isolated from a complex mixture, such as a tissue culture.

Q

℞

Radio-labelled - Describes a substance, e.g., an antibody, that is tagged with a radio-active isotope so that the substance may be tracked or quantitatively evaluated; may be used in techniques such as RIA.

Range - In statistics, the difference between the largest and smallest values in a distribution. In common use, the span of values from smallest to largest.

Reactogenicity (reaction) - The local and systemic adverse experiences that follow immediately after or in a short period after vaccination. See Local reactogenicity and Systemic reactogenicity.

Recall - The removal of a product from market. Recalls may be voluntary or mandatory.

Recombinant vaccine - A vaccine in which desired antigens or antigen proteins are inserted into a vector, such as a virus, which has very low virulence.

Reconstitution - The process of adding a liquid to a powder. Some prescription drugs and vaccines are provided as a dry powder requiring reconstitution before use.

Regulatory T cells - Suppress lymphocytes and control the immune response.

Reminder systems - The systems to help inform those who administer vaccines that an individual patient is due for specific vaccinations.

Reservoir - Any living or non-living substance in or on which an infectious agent can live and multiply, serving as a source of infection. The reservoir is not usually injured by the presence of infectious agent.

RhoGAM - A solution of antibodies to Rh antigens given by injection to prevent haemolytic disease of the newborn (Rhesus disease). It can prevent maternal sensitization from a Rhesus (Rh) positive fetus in an Rh negative mother.

RIA (Radio immunoassay) - A procedure that is capable of assessing the immunogenicity of a vaccine by measuring antibody levels; the assay works by first binding antigen to specific antibody, and then a radioactive indicator specific to the antibody is added; antibody levels are assessed by quantitating the amount of bound radio-labelled indicator.

Risk - The probability of harm being caused.

Risk behaviours - The behaviours that increase the likelihood that an individual will experience a certain event or may be harmed.

Risk communication - An exchange of information aimed at increasing the understanding of health risks.

Risk perception - The subjective judgment that an individual makes about the characteristics and severity of a risk. An individual’s perception of risk may not accurately reflect their actual level of risk.



Route of administration - The method by which a vaccine is introduced into the body. There are five routes of administration:

- Intramuscular, where the vaccine enters through the muscle;
- Subcutaneous, where the vaccine is injected under the skin;
- intradermal, where the vaccine is placed on the skin and absorbed;
- Intranasal, where the vaccine is introduced through the nose; and
- Oral, where the vaccine is swallowed in pill, capsule, or liquid form.

Routine practices - The activities that are done to help reduce the risk of being exposed to blood, body fluids, or non-intact (broken) skin of other people. Proper hand hygiene, use of face protection (i.e., masks or shields) and gloves, safe sharps handling, and environmental cleaning are examples of routine practices.

S

Safety-engineered injection devices - The injective devices that are designed to help prevent needle stick injuries and reduce exposure to blood borne pathogens. Examples of safety engineered injection devices include hypodermic needles and syringes, pre-filled syringes, insulin-injection needles, and jet injectors.

Sensitization - Initial contact with an allergen which results in IgE production so that subsequent contact leads to rapid allergic reaction.

Sequelae - A pathological condition resulting from a prior disease, injury, or attack (i.e. a sequela of polio). Verbatim from the Latin “sequela” (meaning sequel). Plural: sequela.

Serious Adverse Event (SAE) - An adverse event that is fatal or life-threatening that results in hospitalization or prolongation of hospitalization; can also result in significant disability or incapacity, in a congenital anomaly or birth defect. SAEs must be reported to authorities and are not necessarily due to vaccination.

Seroconversion - Used to show the effectiveness of vaccines; SC occurs when following a disease or vaccination an individual generates antigen-specific antibodies; SC may be defined as a certain concentration of serum antibody or as a certain change in titres above pre-vaccination levels.

Seroconversion rate - Seroconversion is usually mentioned as a rate, i.e. the percentage of vaccinees who respond to vaccination by producing measurable antigen-specific antibody levels at a given time after vaccination.

Serogroups - A group of micro-organisms containing a common antigen that may include more than one serotype.

Serological correlate for protection - This is an antibody titre, which has been demonstrated to be correlated with protection in the event an individual is subsequently exposed to the pathogen (e.g., anti-HBsAg \geq 10 IU/ml; anti-PRP \geq 0.15 μ g/ml).

Serological markers - Antigenic proteins or antigen-specific antibodies that may be used as diagnostic markers for disease.

- HBcAg: The hepatitis B virus “c” antigen is a protein of the virus core; although this antigen is undetectable in the blood, antibodies to HBcAg are used as an indication of infection;
- Anti-HBcAg antibodies: The presence of these antibodies indicates exposure to the hepatitis B virus and is used as a measure of infection; while “IgM class” anti-HBcAg antibodies represent a recent infection, the presence of IgG (sometimes called “total”) anti-HBcAg antibodies may represent either recent or past infection;



- **HBeAg:** The hepatitis B virus “e” antigen is a subunit of the HBcAg, its presence in the blood indicates active virus replication;
- **Anti-HBeAg antibodies:** The presence of these antibodies is normally associated with a reduction of active virus replication but does not represent immunity to the infection; these antibodies may not always be detectable following infection;
- **HBsAg:** Hepatitis B “s” or surface antigen is found in the outer structures of the virus; the presence of HBsAg in the blood is an indication of infection; if it is present for six months or longer it indicates “carrier” disease status; and
- **Anti-HBsAg antibodies:** The presence of these antibodies indicates immunity to the hepatitis B virus and they may be induced either by natural infection or by vaccination.

Seroprotection - Is when an individual has generated antigen-specific antibody titres in response to disease or vaccination that are equal to or above an expected standard, which has been correlated to disease protection (this standard is called the “serological correlate for protection”).

Seroprotection rate - Is similar to seroconversion rate in being a population measurement, it measures the percentage of a group that have achieved seroprotective levels of antigen specific antibodies.

Serotypes - A group of micro-organisms containing a similar set of antigens.

Special considerations – An umbrella term used to encompass contraindications, exemptions, precautions and adverse events following immunization.

- **Contraindications:** Specific immunizations are intentionally not administered because the health risk outweighs the benefit to the recipient;
- **Exemptions:** Clients are exempted because of prior immunity (e.g., had the immunization before or had the disease) or refusal (e.g., medical, religious, or philosophical);and
- **Precautions:** Indication that the recipient may be at an increased risk of an adverse event following immunization. If the benefit of immunization outweighs the risk, the vaccination will be administered, likely under special recommendations.

Special populations - The classifications used to identify target groups requiring specialized immunization program management based on eligibility.

Sporadic - A disease or event that occurs infrequently and irregularly.

Stock rotation (rotation of stock) - The placement and rearrangement of vaccine vials and boxes so that those with the earliest expiration date are the most accessible, allowing them to be used first.

Subunit vaccine - The vaccines consisting of surface antigens only. Purified subunit vaccines contain purified bacterial or viral protein fractions. They are generally better tolerated than whole bacteria or virus vaccines.

Subcutaneous injection - Injection of a biological product into the layer of fatty tissue between the skin and muscle.

Surveillance The monitoring of vaccine safety to maintain public confidence in vaccines and immunization programs. See Passive surveillance, active surveillance, and syndromic surveillance.

Syndromic surveillance - The surveillance of health data to detect epidemics, monitor their impact on public health, characterize affected populations, and monitor the effectiveness of response to the epidemic.

Systemic reaction - The general adverse effects such as fever, irritability, fatigue, anorexia, vomiting, or periods of excessive or inconsolable crying following vaccination. These reactions may cause concern to parents and physicians, but most are completely reversible with no permanent consequences.



T

T-cell (T-lymphocyte) - A class of lymphocytes so called because they originate in the bone marrow but mature in the thymus before being released into the bloodstream; T-cells are important in controlling cell mediated immune reactions and B-cell development. T-cells are either helper (CD4) or cytotoxic (CD8) phenotype.

T-helper cells (Th) - A functional subclass of T cells, carrying the CD4 surface marker, which can help to generate cytotoxic T cells (CTL) and cooperate with B cells in the production of antibody responses; Th cells recognize antigen in association with Class II MHC proteins.

- **T-helper 1 (Th1) cells:** A further differentiated subset of Th cells that is characterized by its unique profile of cytokine production; Th1 cell responses are characterized by the appearance of high levels of IFN- γ ; Th1 cells serve to activate CTL cells, and attract and activate other macrophages that are important in eliminating intracellular infections.
- **T-helper 2 (Th2) cells:** This differentiated subset of Th cells is also characterized by its unique profile of cytokine production; Th2 cell responses are associated with the appearance of high levels of interleukins IL-4, IL-5, IL-10; Th2 cells serve to activate antibody-mediated response.

Targeted immunization - The immunization program aimed at a specific group(s) or population(s).

Thimerosal - A mercury-based preservative used in the manufacturing process of multidose vaccines to prevent infections at the vaccination site. It is metabolized into ethylmercury, which needs to be distinguished from methylmercury. Ethylmercury is much less likely than methylmercury to accumulate in the body and cause harm.

Thymus - A small glandular organ that is situated behind the top of the breastbone, consisting mainly of lymphatic tissue and serving as the site of T-cell maturation and differentiation.

Titre - Refers to the levels of antigen-specific antibody produced following vaccination.

Toddler - Age 12 month up to the age of 3 years.

Toxoid - A toxin that has been treated to destroy its toxic property, but retains its capability to stimulate the production of antitoxin antibodies.

Transmissibility - The ability of a disease to be passed from an infected individual or group to a previously uninfected individual or group. An infectious disease may be transmitted by:

- Droplet contact through coughing and sneezing;
- Direct physical contact;
- Indirect contact, usually by coming into contact with contaminated surface or soil;
- Airborne transmission;
- Fecal-oral transmission, usually from contaminated food or water sources; or
- Vector-born transmission, where infection is carried by an insect or other animal and transmitted to humans.

Travelers - The people travelling or who have travelled to areas where high disease endemicity is possible and for whom the immunization status is unknown.

U

Urticaria - Also called hives; small areas of local inflammation of the skin.

V

Vaccination - Is a method of preventing certain infections. It consists of introducing preparations called vaccines into an organism for the purpose of inducing active immunity. Refer to Immunization.



Vaccine - A preparation of live (usually attenuated or treated) or inactivated microorganisms or fractions thereof administered to induce immunity.

Vaccine-preventable disease (VPD) - Any infectious disease for which a vaccine exist.

Valent - Refers to the number of antigenic components of a vaccine.

Vector - Autonomously replicating DNA molecules which can be used to clone and move inserted DNA from cell to cell. Commonly used vectors are viruses and bacterial plasmids.

W

Waning immunity - The loss of immunity over time, including even the loss of memory cells; without some antigen-specific restimulation of the immune system to make more memory cells (either in the form of booster vaccination or disease exposure) the memory response will be lost; by this principle there is no life-long immunity following administration of live-attenuated vaccines or even from natural infection.

Wild type - The original parent strain of a virus, bacteria, fruit fly, mouse, or other laboratory test organism. Often refers to how organisms are found naturally, in the wild, before mutations were induced by researchers.

Wild type infection - The infection caused by the original parent strain of a virus, bacteria, fruit fly, mouse or other laboratory test organism.

X

Y

Z

APPENDIX 14.2: REGIONAL HEALTH AUTHORITIES AND FIRST NATIONS JURISDICTIONS

ATHABASCA HEALTH AUTHORITY

Box 124
BLACK LAKE SK S0J 0H0
Tel: 306-439-2200

CYPRESS HEALTH REGION

350 Cheadle Street West
SWIFT CURRENT SK S9H 4G3
Tel: 306-778-5280

FIRST NATIONS & INUIT HEALTH BRANCH

Health Protection Division
4th Floor, 2045 Broad Street
REGINA SK S4P 3T7
Tel: 306-780-3499

FIVE HILLS HEALTH REGION

107-110 Ominica Street West
MOOSE JAW SK S6H 6V2
Tel: 306-691-1500

HEARTLAND HEALTH REGION

Box 1300
ROSETOWN SK S0L 2V0
Tel: 306-882-6413

KEEWATIN YATTHÉ HEALTH REGION

Box 40
BUFFALO NARROWS SK S0M 0J0
Tel: 306-235-2220

KELSEY TRAIL HEALTH REGION

Box 6500
MELFORT SK S0E 1A0
Tel: 306-752-6310

MAMAWETAN CHURCHILL RIVER HEALTH REGION

Box 6000
LA RONGE SK S0J 1L0
Tel: 306-425-2422

NORTHERN INTERTRIBAL HEALTH AUTHORITY

Box 787
PRINCE ALBERT SK S6V 5N6
Tel: 306-953-0670

PRAIRIE NORTH HEALTH REGION

11427 Railway Ave., Suite 101
NORTH BATTLEFORD SK S9A 1E9
Tel: 306-446-6400

PRINCE ALBERT PARKLAND HEALTH REGION

McIntosh Mall
800 Central Avenue
Box 3300
PRINCE ALBERT SK S6V 7V6
Tel: 306-765-6500

REGINA QU'APPELLE HEALTH REGION

Population and Public Health Services
2110 Hamilton Street
REGINA SK S4P 2E3
Tel: 306-766-7777

SASKATOON HEALTH REGION

Public Health Services
#101 - 310 Idylwyld Drive North
SASKATOON SK S7L 0Z2
Tel: 306-655-4620

SUN COUNTRY HEALTH REGION

900 Saskatchewan Drive
Box 2003
WEYBURN SK S4H 2Z9
Tel: 306-842-8618

SUNRISE HEALTH REGION

150 Independent Street
YORKTON SK S3N 0S7
Tel: 306-786-0600

APPENDIX 14.3: IMMUNIZATION FACT SHEETS

Fact Sheet Title	Updated	French Version
Caring for Your Child's Fever	July 2018	Comment soigner la fièvre de votre enfant
Diphtheria, Tetanus, Pertussis, Polio, and Haemophilus influenzae type b Vaccine	April 2017	Vaccin contre la diphtérie, le tétanos, la coqueluche, la polio et l'Haemophilus influenzae de type b
Haemophilus influenzae type b Vaccine	April 2017	Vaccin contre l'Haemophilus influenzae de type b
Hepatitis A and Hepatitis B Vaccine	April 2017	Vaccin contre l'hépatite A et B
Hepatitis A Vaccine	August 2017	Vaccin de l'hépatite A
Hepatitis B Vaccine	April 2017	Vaccin contre l'hépatite B
Hepatitis B Immune Globulin	April 2017	L'immunoglobuline de l'hépatite B
Human Papillomavirus Vaccine	August 2017	Vaccin contre les papillomavirus humains (Pour les filles seulement)
Immune Globulin	April 2017	Immunoglobuline (humaine)
Measles, Mumps, Rubella Vaccine	April 2017	Vaccin contre la rougeole, les oreillons et la rubéole
Measles, Mumps, Rubella, Varicella Vaccine	August 2017	Vaccin contre la rougeole, les oreillons, la rubéole et la varicelle
Meningococcal Conjugate C Vaccine	April 2017	Vaccin contre le méningocoque de groupe C
Meningococcal Conjugate A, C, Y and W-135 Vaccine	April 2017	Vaccin conjugué antiméningococcique (sérogroupes A, C, Y et W 135)
Meningococcal B Vaccine	August 2017	Vaccin contre le méningocoque de groupe B
Pneumococcal Conjugate 13 Vaccine	April 2017	Vaccin antipneumococcique conjugué VCP 13
Pneumococcal Polysaccharide 23 Vaccine	April 2017	Vaccin polysaccharidique 23-valent contre le pneumocoque
Polio Vaccine	April 2017	Vaccin contre la polio
Rabies Immune Globulin and Vaccine	April 2017	Vaccin et immunoglobulines antirabiques
Rotavirus Vaccine	April 2018	Vaccin antirotavirus
Seasonal Influenza Vaccine 2017-18	August 2017	Vaccin contre la grippe saisonnière (influenza) 2017-2018
Tetanus and Diphtheria Vaccine	April 2017	Vaccin contre le tétanos et la diphtérie
Tetanus, Diphtheria, Pertussis Vaccine	July 2018	Vaccin contre le tétanos, la diphtérie, la coqueluche
Tetanus, Diphtheria, Pertussis, Polio Vaccine	August 2017	Vaccin contre le tétanos, la diphtérie, la coqueluche et la polio
Tetanus, Diphtheria, Polio Vaccine	April 2017	Vaccin contre le tétanos, la diphtérie et la polio
Tetanus Immune Globulin	April 2017	Immunoglobuline antitétanique
Tuberculosis (TB) Skin Test	April 2017	Tests cutanés de dépistage de la tuberculose
Vaccine Options to Protect Your Child From Measles, Mumps, Rubella and Varicella	April 2017	
Varicella Vaccine	August 2017	Vaccin contre la varicelle
Varicella Immune Globulin	April 2017	Immunoglobuline antivaricelle

APPENDIX 14.4: IMMIGRANT IMMUNIZATION RESOURCES

Canadian Medical Association Journal (2011) Evidence-based clinical guidelines for immigrants and refugees. Available at: <http://www.cmaj.ca/content/183/12/E824>

Canadian Paediatric Society *Caring for Kids New to Canada: A guide for health professionals working with immigrant and refugee children and youth.* Available at: kidsnewtoCanada.ca.

Centers for Disease Control and Prevention (2011) *Epidemiology and Prevention of Vaccine Preventable Diseases*, 12th Edition. Appendix B: Foreign Vaccines. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/foreign-products-tables.pdf>

HealthLink BC Translated Resources available at: <http://www.healthlinkbc.ca/servicesresources/translatedresources/>

Immunization Action Coalition

A Quick Chart of Vaccine-Preventable Disease Terms in Multiple Languages. Available at: <http://www.immunize.org/izpractices/p5121.pdf>

Immunization Action Coalition Translated screening questionnaires in Spanish, Arabic, Chinese, French, Hmong, Korean, Russian, Turkish, and Vietnamese. Available at: <http://www.immunize.org/handouts/screening-vaccines.asp>

iTranslate is an iPhone app available at: <http://www.itranslateapp.com/>. It translates literally and you can get it to write, speak and control the cadence of the language. This is nice for clients who are illiterate.

Medline Plus

Childhood Immunization - Multiple Languages. Available at: <http://www.nlm.nih.gov/medlineplus/languages/childhoodimmunization.html>

Multicultural Health Communication available at: <http://mhcs.nsw.pretagov.com.au/>

Public Health Agency of Canada

A Parent's Guide to Immunization. Immunization information in 13 languages. Available at: <http://www.phac-aspc.gc.ca/im/iyc-vve/pgi-gpv/lang-eng.php>
Order printed copies—for free printed copies, call: 1 800 O-Canada (1-800-622-6232).

Public Health Agency of Canada

Canadian Immunization Guide (2013). Part 3 - Vaccination of Specific Populations - Immunization of Persons New to Canada. Available at: <http://www.phac-aspc.gc.ca/publicat/cig-gci/p03-11-eng.php>

World Health Organization

WHO vaccine-preventable diseases: monitoring system: 2013 global summary. Available at: http://apps.who.int/immunization_monitoring/globalsummary/schedules



March 22, 2018

TO: Physicians, Nurse Practitioners and Midwives

Re: Immunization with Tdap vaccine in every pregnancy.

Communication was issued October 24, 2017 outlining the interim measure to provide publicly funded pertussis-containing vaccine to pregnant clients. This communication confirms the permanent recommendation that Tdap (tetanus-diphtheria-acellular pertussis) vaccine be routinely offered to patients in every pregnancy, irrespective of their previous Tdap immunization history. One dose of Tdap should ideally be provided between 27 and 32 weeks of gestation (previously suggested "as of 26 weeks gestation").

While it is preferable that immunization is administered in sufficient time before birth (i.e. 4 weeks) to allow optimal transfer of maternal antibodies and direct protection of the infant against pertussis, it should be considered until the end of pregnancy as it has the potential to provide partial protection to the infant.

Earlier immunization between 13 and 26 weeks of gestation may be considered in some situations (e.g. pregnancies with an increased risk of preterm delivery or travel) to allow for longer placental exposure to higher antibody levels and maximization of antibody transfer. If Tdap immunization was provided early in the pregnancy (e.g. prior to recognition of pregnancy), it is not recommended to re-immunize after 13 weeks of gestation.

For further information regarding Tdap in pregnancy, please refer to the National Advisory Committee on Immunization (NACI) February 2018 Statement: *Update on Immunization in Pregnancy with Tetanus Toxoid, Reduced Diphtheria Toxoid and Reduced Acellular Pertussis (Tdap) Vaccine* at <https://www.canada.ca/en/public-health/services/publications/healthy-living/update-immunization-pregnancy-tdap-vaccine.html>

Currently there are no recommendations to repeat Tdap after delivery in a patient who has received Tdap as an adult but was not immunized in pregnancy. The immunization status of patients who did not receive Tdap in pregnancy should be reviewed and immunizations provided as per the routine immunization schedule.

For more information, please contact your local Public Health Office.

Sincerely,



Dr. Saqib Shahab
Chief Medical Health Officer

cc: Medical Health Officers
Public Health Nurse Managers
Immunization Coordinators
Public Health Nurses



Government
of
Saskatchewan

Population Health

Ministry of Health
3475 Albert Street
Regina, Canada S4S 6X6

March 29, 2018

TO: Medical Health Officers
Public Health Nurse Managers
Immunization Coordinators
Public Health Nurses

Re: **New Rotavirus Vaccine Implementation - RotaTeq®**

Commencing April 1, 2018, Canadian jurisdictions will transition from using Rotarix® (Rot-1) to RotaTeq® (Rot-5) rotavirus vaccine in their infant rotavirus immunization programs. Due to its lower price, Merck (the manufacturer of RotaTeq®) was awarded the 2018-19 national rotavirus vaccine contract.

RotaTeq® is a pentavalent vaccine that protects against rotavirus gastroenteritis caused by types G1, G2, G3, G4 and G9. It is a 3-dose oral series that will be given at 2, 4, and 6 months of age to Saskatchewan infants born on or after April 1, 2018.

Saskatchewan infants born before April 1, 2018 will continue to receive the 2-dose Rotarix® (Rot-1) monovalent vaccine (manufactured by GSK) that protects against type G1. Our provincial Rotarix® supply is anticipated to last until early summer. Once supplies are exhausted, these infants will continue their rotavirus series with two doses of RotaTeq®.

Both vaccines are equally effective to prevent rotavirus gastroenteritis. The Saskatchewan Immunization Manual, rotavirus vaccine fact sheet and the Panorama forecaster have been revised to accommodate the rotavirus program updates.

Sincerely,



Dr. Saqib Shahab
Chief Medical Health Officer



May 15, 2018

TO: Medical Health Officers
Public Health Nurse Managers
Immunization Coordinators
Public Health Nurses

Re: Re-Immunization Directive – Oral Polio Vaccine Doses Documented as of April 1, 2016

Documented doses of oral polio vaccine (OPV) received on or after April 1, 2016 will not be considered as a valid dose within the routine Saskatchewan Immunization Schedule. This applied to all clients with documented immunization records.

According to the World Health Organization, as of April 2016, trivalent OPV was replaced with either bivalent or monovalent OPV. In order to ensure protection against all three poliovirus types, any doses of OPV received on or after April 1, 2016 are not considered valid doses within the routine Saskatchewan Immunization Schedule. Therefore all individuals presenting with documented records of OPV or OPV/inactive polio vaccine (IPV) or polio-unspecified doses received on or after April 1, 2016, will require re-immunization with IPV or an IPV-containing vaccine to replace these doses as per IPV dose requirements based on client age.

Saskatchewan Health Authority, Athabasca Health Authority and First Nations Jurisdictions staff is to document OPV, OPV/IPV or Polio unspecified doses received on or after April 1, 2016 into Panorama as Polio-u. These doses are to then be manually invalidated.

As usual, a passive opportunistic approach to re-immunization is requested of all Public Health staff. Because IPV vaccine supply has been nationally shorted in past years, active invitation of clients for immunization is highly discouraged.

The Saskatchewan Immunization Manual and the Panorama forecaster will be revised in the future to accommodate this directive.

Sincerely,

Dr. Saqib Shahab
Chief Medical Health Officer



July 27, 2018

TO: Medical Health Officers
Public Health Nurse Managers
Immunization Coordinators

Re: **Diphtheria, Tetanus and Pertussis Vaccines and a Rabies Vaccine Manufactured in China**

Public Health is receiving questions from physicians and parents regarding two diphtheria, tetanus and pertussis (whooping cough) (DTP) vaccines, and a rabies vaccine, manufactured and administered in China that have recently received media attention. Based on information from the World Health Organization and Health Canada received to date, the Saskatchewan Ministry of Health is providing the following information and advisement. We will provide updates should additional information become available.

DTP Vaccines

Two batches (lots) of DTP vaccines were recalled by the China Food and Drug Administration (CFDA) on October 29, 2017 after failing potency testing. The issue is one of vaccine effectiveness and not vaccine safety. The vaccines were used in China from March 2017 to October 2017 for childhood vaccination. These vaccines have not been distributed in Canada.

The recalled Chinese DTP vaccines are:

1. Lot # 201605014-01 produced by Changchun Changsheng Biotechnology Co., Ltd.
Purchased by: Shandong Provincial Center for Disease Control and Prevention.
2. Lot # 201607050-2 produced by Wuhan Biological Products Research Institute Co., Ltd.
Purchased by:
 - Chongqing (City) Disease Prevention and Control Centers; and
 - Hebei Provincial Center for Disease Control and Prevention.

In China, DPT vaccine is routinely given to children at 3, 4, 5 and 18 months of age. Children who were immunized by the three jurisdictions mentioned above, and between March 2017 and October 2017, may need to receive additional vaccine doses for full protection. China has not reported more cases of diphtheria, tetanus or pertussis in relation to the use of these vaccines.

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China CDC has reported that children residing in China who received these DTP vaccines have been identified through its national electronic Children Immunization Information Management System (CIIMS) and are being revaccinated. Furthermore, Chinese public health authorities have advised that parents or guardians of children can check the vaccination record of DTP on the child vaccination certificate and compare with the vaccine manufacturer and lot number information (listed above) to determine whether the recalled DTP vaccine was used. Parents can also consult the inoculation unit in China where the child was immunized to find out whether their child received a dose of the recalled vaccine lot. Those living in China can also call the 12320 public health hotline for consultation.

It is not clear whether China will be identifying and notifying children not currently residing in China who were vaccinated in China with a recalled product.

Advice for Parents

If your child was immunized in one of the three geographical areas (Shandong, Chongqing or Hebei) between March 2017 to October 2017, please check your child's immunization record. If you do not have their record, you may be able to obtain it from Chinese public health authorities as outlined in the paragraph above.

If your child's immunization record indicates that they received DTP vaccine with an affected lot number (see above), or if a lot number is not recorded but DTP vaccine was given any time from March to October 2017 in one of the three geographical areas, please contact your local public health office for assessment and, if recommended, additional vaccination. Doses of affected lots may not have provided full protection and your child may require additional doses of DTP-containing vaccine.

Advice to Healthcare Professionals

Consider any doses that meet the criteria outlined above to be 'invalid'. Titres are not recommended to assess for immunity to DTP. Proceed with re-immunizing the child based on their historical receipt of valid doses and their current age as outlined in the *Saskatchewan immunization Manual*
<https://www.ehealthsask.ca/services/manuals/Pages/SIM.aspx>.

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Rabies Vaccine

On July 15, 2018, Changchun Biotechnology Co., Ltd. was found to have falsified production records of rabies vaccines in an unannounced inspection by the CFDA. We have been told that the company's licence has been revoked with orders to stop production, issue recalls of the rabies vaccines, and suspend the issuance of all products. There is limited information on the specifics of vaccines associated with this July 2018 recall at this time; however we will update you if we hear anything further. The Public Health Agency of Canada is reaching out to Chinese public health officials through the International Health Regulations Focal Point to request additional information.

Regards,



Dr. Saqib Shahab
Chief Medical Health Officer



September 20, 2018

TO: Medical Health Officers
Public Health Nurse Managers
Immunization Coordinators
Public Health Nurses

Re: New Publicly Funded Vaccine Eligibility - Pevnar® 13 for Adults with HIV

Eligibility for publicly funded Pevnar® 13 (pneumococcal conjugate C 13 [Pneu-C-13]) vaccine now includes adults with human immunodeficiency virus (HIV).

Adult solid organ or islet cell transplants candidates or recipients, and hematopoietic stem cell transplant (HSCT) recipients remain eligible for this vaccine as per current transplant agency recommendations.

Public Health staff are expected to take an opportunistic approach for adult immunizations.

The Saskatchewan Immunization Manual chapters 7 and 10 will be updated for September 2018. The Panorama Forecaster will be revised to reflect the expanded eligibility criteria at a later date.

Sincerely,



Dr. Saqib Shahab
Chief Medical Health Officer



October 3, 2018

TO: Medical Health Officers
Public Health Nurse Managers
Immunization Coordinators
Public Health Nurses

Re: MMR Immunization Questions and Answers Regarding Travelling Infants

Publicly funded MMR may be offered to infants 6-11 months old who are travelling outside of Canada, the United States of America (including Hawaii), Mexico and most Caribbean countries. Infants 6-11 months old do not need MMR if they are travelling to a destination on page two. For destinations where MMR may be offered, the risk of measles is generally higher for those on extended travel (e.g., visiting friends and family) rather than for those on shorter vacations or business trips. Please review the questions and answers below.

- 1) Are there any changes to the provincial MMRV immunization schedule?
No. Children are due for the first dose at 12 months and the second dose at 18 months old.
- 2) Is MMR vaccine publicly funded for infants younger than one year old?
Yes. Infants six months to younger than 12 months of age may receive one publicly funded MMR dose if they are travelling:
 - A. To mass gatherings (generally defined of $\geq 25,000$ people according to the WHO) of international travellers (e.g. sporting events, pilgrimages, etc.) anywhere in the world;
or
 - B. To countries and territories that are not listed on page two.
- 3) What are the recommendations for the timing for MMR vaccine to be given to infants six months to younger than 12 months of age pre-travel?
 - A. If not travelling in the next four weeks, inform parents of infants who will not be 12 months of age at time of travel to schedule an appointment for MMR approximately four weeks prior to departure if possible.
 - B. Offer MMR to infants who present for vaccination less than four weeks prior to departure and inform parents that their infants may not be protected against measles until four weeks post-immunization, but that no additional precaution measures are required.
 - C. If travel plans permit, delay giving MMR if the infant would otherwise become eligible for MMRV at 12 months of age prior to departure.
 - D. NOTE: Infants who receive a dose of MMR vaccine before 12 months of age require the two routinely recommended doses of MMRV vaccine, administered at 12 and 18 months of age. Do not give MMRV prior to 12 months of age. Refer to the SIM Routine Immunization Schedules <http://www.health.gov.sk.ca/sim-chapter5>.
- 4) If a child has received their 12 month dose of MMRV, but is younger than 18 months, do you advise using minimal intervals to immunize these children if they are traveling to an outbreak zone?
No. For children who have received their 1st MMRV dose at 12 months of age, they should receive their 2nd MMRV dose at the regularly scheduled vaccine interval at 18 months old. For exceptional circumstances, please consult with the MHO.

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Infants 6-11 months old do not need MMR if they are travelling to or within:

Antigua & Barbuda	Curacao	Saint Lucia
Anguilla	Dominica	Saint Vincent & the Grenadines
Aruba	Dominican Republic	Saba
Bahamas	Grenada	Saint Barthelemy
Barbados	Greenland	Saint Martin
Bermuda	Guadeloupe	Saint Pierre & Miquelon
Bonaire	Jamaica	Sint Eustatius
British Virgin Islands	Martinique	Sint Maarten
Canada	Mexico	Trinidad & Tobago
Cayman Islands	Montserrat	Turks & Caicos Islands
Clipperton Island	Navassa Island	United States of America
Costa Rica	Puerto Rico	US Virgin Islands
Cuba	Saint Kitts & Nevis	

Note: The Ministry of Health will issue travel advisories as applicable should any of these MMR exclusions change in the future.

Sincerely,



Dr. Saqib Shahab
Chief Medical Health Officer