Yukon Immunization Program Manual

Section 1 – Introduction

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1.0 INTRODUCTION

This manual is an amalgamation and adaptation of the previous Yukon Immunization Manual and with permission of the British Columbia Centre for Disease Control (BCCDC) Communicable Disease Control Manual, Chapter 2, Immunization Program (1). Thank you to all the providers who have contributed to the Yukon Immunization Program and the BC Immunization Program. Their expertise and experience has greatly facilitated the development of this program to meet the ever changing needs of Yukon and the Health Care Providers.

The Territorial Advisory Committee on Immunization (TACI) reviews the science associated with communicable disease prevention and control. Community Health Programs analyzes the programmatic issues (e.g., feasibility and acceptability) associated with implementation of a new or revised vaccine program and makes recommendations to Yukon Territorial Government on matters pertaining to immunization preventable disease.

The Yukon Territorial Government provides budgetary support for immunization programs and services. Recommended programs are based on an extensive consultative process with many stakeholders including TACI.

The BCCDC Communicable Disease Control Manual Chapter 2: Immunization Program, provides best practice guidelines to direct the provision of immunization services (1).

All immunizers including but not limited to: Community Nursing, Kwanlin Dun Health Centre, Yukon Communicable Disease Control, Whitehorse General Hospital, Continuing Care, Pharmacies, Mental Wellness and Substance Use have a role in this program to ensure that: the largest possible percentage of the Yukon community is current in their immunization status, to provide relevant information about the vaccines approved for use and to provide a service for the administration of these vaccines within the community.

Yukon Guidelines take precedence over any guideline found in the Canadian Immunization Guide or other printed material distributed for reference, including the product monograph. This guide is meant to be used as the sole reference for decision making in regards to immunization.

The *Canadian Immunization Guide*, is the key reference for the Yukon Immunization Program and can be used by immunization providers for additional background information when necessary (2). Recommendations in the *Canadian Immunization Guide* are made by the National Advisory Committee for Immunization (NACI).

2.0 IMMUNIZATION ROLES AND RESPONSIBILITIES

2.1 DEPARTMENT OF HEALTH AND SOCIAL SERVICES

Publicly funded vaccine programs approved for the Yukon.

Review recommendations made by the Territorial Advisory Committee on Immunization (TACI).

2.2 TERRITORIAL ADVISORY COMMITTEE ON IMMUNIZATION (TACI)

Provide expert advice to the Department of Health and Social Services on immunization programs in the Yukon.

2.3 YUKON IMMUNIZATION PROGRAM — COMMUNITY HEALTH PROGRAMS

The Yukon Immunization Program will:

- Develop strategic plans to attain and maintain goals and objectives.
- Provide immunization against vaccine-preventable diseases of a serious health consequence to targeted high-risk populations.
- Facilitate immunization program delivery by trained service providers who follow Yukon Immunization Program guidelines.
- Investigate incidents where Yukon Immunization Program standards of practice are not followed including but not limited to cold chain breaks and vaccine related medication incident reports.
- Have an Immunization Competency Program in place for their public health staff.
- Provide an individual immunization record to the client when requested.
- Submit adverse events following immunization events to the Public Agency of Canada
- Supply vaccines to community vaccine providers who manage, monitor, report, and deliver safe and effective immunization services.
- Vaccine Program Manager – Chair the Territorial Advisory Committee on Immunization
- Develop and maintain a contingency plan to address mass immunization requirements
- Collect, analyze, and disseminate immunization statistics

2.4 COMMUNITY NURSING HEALTH CENTRES, KDFN HEALTH CENTRE, YCDC AND YHC FACILITIES

All facilities are responsible for the planning, delivery and evaluation of preventive health services, including immunization. The provision of routine immunization programs and targeted immunization programs is an essential or "core" program that is delivered throughout Yukon.

All facilities collaborate with the Yukon Immunization Program in carrying out vaccine management, surveillance, and evaluation.

All vaccine providers will:

- Follow the Yukon Immunization Program guidelines for immunization.
- Ensure that vaccine maintains potency (optimal transportation, storage, handling, and conservation), and report in a timely manner any cold chain incidents. For more information see Yukon Immunization Program Manual, Section 7, Storage and Handling of Immunization Agents.
- Document all immunizations given and historical vaccines in the client's Panorama record. For more information see Yukon Immunization Program Manual, Section 9, Documentation Guidelines.
- Report all adverse events following any immunization to their nurse in charge/facility manager and the Yukon Immunization Program Manager. For more information see Yukon Immunization Program Manual, Section 13, Adverse Events Following Immunization.
- **Report all suspected** vaccine errors to the Yukon Immunization Program Manager, Community Health Programs.

3.0 IMMUNIZATION COMPETENCY

The Yukon Immunization Program assists all health professionals who provide immunization to be knowledgeable vaccine providers, educators, and advocates for immunization. A vaccine provider should demonstrate the attitudes, knowledge, and clinical skills necessary to provide safe and effective immunization programs.

The 2008 National Immunization Competencies for Health Professionals document published by the Public Health Agency of Canada, is supported by the Yukon Immunization Program and has been adapted to the Yukon context(3), named **Yukon Immunization Competencies for Health Professionals.** These competencies provide the framework for the Yukon Immunization Competency exam and will assist all immunizers by providing a structure of ongoing learning on safe and competent vaccine practice. Each immunizer is encouraged to review the Yukon Immunization Competencies for Health Professionals to determine personal learning opportunities and suggested content for learning.

An Immunization Competency exam for all providers and a Renewal of Competency exam was developed for health care providers working in the various immunizing facilities in the Yukon. These facilities include but are not limited to: Yukon Territorial Government, Kwanlin Dun First Nations, Pharmacies, and Yukon Hospital Corporation. All immunizers must complete the Immunization Competence Exam and Technical Skills Checklist within six weeks of starting employment.

A Certificate for Immunization Competence will be issued upon successful completion of the exam and is valid only in the Yukon. Recertification is required every two years.

4.0 OPPORTUNITY FOR IMMUNIZATION IN ALL HEALTH CARE SETTINGS

The best way to reduce vaccine-preventable diseases is to have a highly immune population (2). Immunization programs in Canada have been very successful in decreasing the incidence of communicable diseases. Challenges remain, particularly in the areas of *missed opportunities for immunization* and improving immunization rates for subgroups of Canadians who are not being fully immunized.

A *missed opportunity for immunization* is a health care encounter in which a person is eligible to receive a vaccination but is not vaccinated or is incompletely vaccinated (2). Missed opportunities occur in all health care settings. Missed opportunities for immunization occur during adult and childhood visits to a health care provider and are just as likely to occur whether the visit is related to acute illness or chronic illness.

A significant portion of Canadian adults (≥ 18 years of age) is vulnerable to vaccine- preventable diseases (2). In addition to the routine vaccines recommended for all individuals, there are also vaccines recommended for individuals with different risk factors arising from occupation, underlying illness, lifestyle, and age. Both adults and children may live in situations that make accessing immunizations at health centres difficult.

Individuals may be seen in a variety of health care settings (e.g., emergency departments, hospital wards, walk-in clinics, physician offices, outpatient clinics, or specialized clinics) (2). For patients without regular sources of care or those followed in specialized clinics, the only opportunities for immunization may be during visits to these settings. For example, chronic kidney disease clients are seen regularly at their physician's offices and it is recommended that they receive all recommended vaccines, including hepatitis B vaccine.

Immunization given in the ER administered by YHC, have their immunizations either directly entered into Panorama by staff (Watson Lake Hospital and WGH- occupation health nurse) or paper logs that are data entered by Whitehorse Health Centre (Whitehorse General Hospital). Taking an immunization history from those seen in emergency or admitted to hospital provides an important opportunity to maintain up-to-date immunization for all patients.

Residents of long term care facilities should receive all routine immunizations appropriate for their age and individual risk status (2). Annual influenza immunization is essential. All residents of intermediate or extended care facilities are eligible for pneumococcal immunization. Every resident should be assessed for prior pneumococcal immunization at time of admission. Those residents who have not received pneumococcal vaccine or who are eligible for a single booster dose should be immunized as soon as possible.

In both acute-care and long-term care settings, it is important that immunization planning be part of organized care plans within each department, with clear accountability for program planning, implementation, and evaluation.

The National Guidelines for Immunization Practices, developed by NACI, are intended to support optimal implementation of immunization programs in order to address ongoing challenges with immunization (2).

5.0 RELATIVE RISKS OF DISEASES AND IMMUNIZATION

Immunization programs are highly successful in reducing the incidence of vaccine- preventable diseases. Because the vaccine-targeted diseases are less common, it is more difficult for people to compare the risks of these diseases to the risks of adverse events following immunization.

Public and mass media concern has shifted to vaccine safety. A higher standard of safety is generally expected of vaccines compared to other medical interventions. As vaccines are given to healthy people, especially infants and children, there is a low tolerance for adverse events.

It is the responsibility of the health care provider to communicate effectively with parents and individuals regarding the benefits and risks of immunization.

5.1 PRINCIPLES OF BENEFIT / RISK COMMUNICATION

- Communicate current knowledge, taking into account what an individual already knows and the level of detail requested. Provide a variety of information formats (e.g., visual, audio, printed material, and web sites). Provide guidance on how to assess web site reliability.

- Respect differences of opinion about immunization. When an individual expresses reluctance or refusal to immunize themselves or their children, assess both the strength of their beliefs and the underlying reasons for their beliefs and actions.

- Represent the benefits and risks of vaccines fairly and openly. Compare the known and theoretical risks of a vaccine with the known risks associated with the vaccine-preventable infection. (Refer to Table 1: Relative Risks of Disease and Immunization) Remind clients that vaccine-preventable diseases have not been eliminated.

- Adopt a client centred approach. Effective decision-making is best done in partnership between the health care provider and the parent or client.

- Make the most of each opportunity to present clear, evidence-based messages regarding vaccines and immunizations. Encourage questions and discussion, address misinformation, and provide valid and appropriate resources, including appropriate web sites, for those who want more information.

In 2010, the Yukon Immunization Program approved for use the resource Immunization Communication Tool for Immunizers to assist providers in addressing many of the questions and concerns parents may have regarding immunization (4).

Consider the following websites when communicating with parents regarding immunization.

Websites listed include information for both health professionals and parents, and include links to other reliable sources of information.

Immunize Canada

Canadian Immunization Guide

Canadian Pediatric Society

Centers for Disease Control and Prevention

Immunize BC

Public Health Agency of Canada, Immunization and Vaccines

World Health Organization *(lists websites with information related to vaccine safety that meet criteria related to credibility, content, accessibility, and design)*

Dr. Paul Offit and colleagues have published 3 articles directly related to parent's concerns regarding immunization that immunizers may find of benefit (5-7):

- Addressing Parents' Concerns: Do Vaccines Contain Harmful Preservatives, Adjuvants, Additives, or Residuals?
- Addressing Parents' Concerns: Do Multiple Vaccines Overwhelm or Weaken the Infant's Immune System?
- Addressing Parents' Concerns: Do Vaccines Cause Allergic or Autoimmune Diseases?

Table 1.0 Relative Risks of Diseases and Immunization (1)

Disease	Risks Associated with Disease	Adverse Events Associated with Vaccine
Diphtheria	• Case fatality: 5 – 10% • Complications are caused by the toxin released by the diphtheria bacteria and include upper airway obstruction, pneumonia, heart failure, and paralysis	• Local reactions (redness, swelling and pain) increasing with age, the quantity of toxoid, and the number of doses received: 16% in children and 10% in adults • Fever and irritability occur less commonly
Tetanus	• Case fatality: 10% • Generalized rigidity and convulsive spasms of skeletal muscles • Severe spasms can cause fractures in the spine and long bones. Spasms in the larynx cause eating and breathing difficulties	• Local reactions (same as above) • Lymphadenopathy and fever may occasionally occur • Serum sickness, brachial plexus neuropathy, encephalomyelitis, and transverse myelitis rarely reported • Risk of Guillain-Barré Syndrome (GBS) following immunization with a tetanus – containing vaccine is 0.4 per million doses of vaccine

Pertussis	• 1 – 3 deaths each year in Canada, primarily in young infants
	• Complications include:
	  • Apnea
	  • Pneumonia: 5.2%
	  • Seizures: 0.8%
	  • Encephalopathy: 0.1%
		• Mild fever in 3 – 5% of vaccine recipients
		• Local reactions (redness, swelling, and pain) increase with the number of doses received
		• Moderate to severe systemic events are reported rarely with acellular vaccines

Disease	Risks Associated with Disease	Adverse Events Associated with Vaccine
Haemophilus influenzae type b	• Meningitis: 55 – 65% • Meningitis case fatality rate: 5% (10 – 15% of Hib meningitis survivors have permanent neurologic sequelae and 15 -20% have deafness) • Epiglottitis, pneumonia, septic arthritis, and cellulitis	• Local reaction (pain, redness, and swelling): 5 – 30%. Symptoms are mild and resolve within 24 hours
Polio	• Aseptic meningitis: 1% of polio infections • Paralytic polio: 1% (25% of these will have post poliomyelitis syndrome) • Death: 5 – 10% in paralytic polio infections (2 – 5% in children and 15 – 30% in adults)	• Local discomfort: 5% • No severe adverse events reported with IPV
Measles	• Febrile convulsions: 2% • Pneumonia, otitis media: 10% • Thrombocytopenia:1/300 cases • Encephalitis: 0.1% (1/1000 cases) (case fatality: 15%; neurologic sequelae: 25%) • Death: 0.05 – 0.3% (1/3000 cases) • Subacute sclerosing panencephalitis: 1/25,000 cases	MMR vaccine: • Malaise and fever, with or without a non-infectious rash: 5% • Parotitis: up to 1% • Swollen glands, stiff neck or joint pains: 5% • Transient arthralgia or arthritis more common in post- pubertal females (25% of post-pubertal females may experience arthralgia, and 10% may have arthritis-like signs and symptoms) • Encephalitis:1 case per million doses • Transient thrombocytopenia: 1 in 30,000 doses

Disease	Risks Associated with Disease	Adverse Events Associated with Vaccine
Mumps	• Parotitis: 30 – 40% • Orchitis: 20 – 30% in post pubertal males • Oophoritis: 5% in post pubertal females • Deafness: 0.5 – 5.0 per 100,000 cases • Encephalitis: 0.5%	• See MMR vaccine above
Rubella	• Acute arthralgia or arthritis: 50% of adolescents and adults • Encephalitis: 1/6,000 cases • Risk of Congenital Rubella Syndrome (CRS) is 85% in maternal infections in the first 10 weeks of pregnancy. CRS may include miscarriage, stillbirth, and fetal malformations such as congenital heart disease, cataracts, deafness, and mental retardation	• See MMR vaccine above

Hepatitis B	• Death: 1 – 2% due to fulminant hepatitis
	• Risk of chronicity depends on age at time of infection:
	  • infants: 90 – 95%;
	  • children 1 – 5years: 30 -50%;
	  • adults: 5%
	• Chronic carriers have an increased risk of hepatic cirrhosis and hepatocellular cancer (cause of up to 80% of hepatocellular carcinomas)
		• Local reactions (tenderness, redness, swelling): 13 – 29% of adults and 3 – 9% of children
		• Fever (up to 37.7°C): 1% of adults and 0.4 – 6.4% of children
		• Mild systemic symptoms such as fatigue, headache, and irritability: 11 – 17% of adults and 0 – 20% of children

Disease	Risks Associated with Disease	Adverse Events Associated with Vaccine
Human Papillomavirus (HPV)	• HPV types 16 and 18 cause 70% of cervical cancer • HPV types 6 and 11 cause 90% of genital warts • HPV causes 36% of oropharyngeal cancer; 24% of oral cancer, and 24% of laryngeal cancer • Recurrent respiratory papillomatosis caused by HPV types 6 and 11may be acquired from mother at birth or occur in adulthood	Injection site reactions: • Pain 83.9% • Swelling 25.4% • Redness 24.6% • Itching 3.1% Systemic reactions: • Fever 10.3% • Nausea 4.2% • Dizziness 2.8% • Diarrhea 1.2%
Influenza	• Viral and bacterial pneumonia • Death reported in 0.5 – 1 per 1000 cases; most deaths in persons ≥ 65 years of age • During epidemics, there may be increased mortality and morbidity among the elderly, the immunocompromised and those with chronic disease	• Local reactions (soreness at injection site): ≤ 7% of children < 3 years of age • Fever: ≤ 12% of children 1 – 5 years of age • Headache, malaise, myalgia: < 1% • Risk of GBS estimated to be 1 excess case per million doses of influenza vaccine

Disease	Risks Associated with Disease	Adverse Events Associated with Vaccine
Meningococcal Disease	• Meningitis is the most common presentation of invasive disease • Meningitis case fatality: 5 – 10%. • Septicemia: 5 – 20% of cases • Pneumonia: 5 – 15% of cases • Arthritis: 2% of cases • Otitis media and epiglottitis: < 1% of cases • Sequelae occur in up to 20% of survivors and include hearing loss, neurologic damage, loss of limbs from gangrene, and kidney damage	**Conjugate vaccines:** • Local reactions (redness, tenderness, and swelling at injection site): up to 50% • Irritability: up to 80% of infants • Fever >39°C: up to 9% (when given at same time as other vaccines) • Headache and malaise: up to 10% of older children and adults • Severe reactions: < 0.01% • Risk of GBS associated with quadrivalent conjugate meningococcal vaccine continues to be monitored **Polysaccharide vaccines:** • Local reactions (pain and redness): up to 50% • Fever: 5%, particularly in infants
Pneumococcal Disease	• Pneumococcal pneumonia is an important cause of death in infants and the elderly • Case fatality rate is 5 – 7% overall (much higher among the elderly) • Most common cause of bacterial meningitis. Case fatality rate is 30% (up to 80% among the elderly) • Bacteremia: case fatality rate is 20% (up to 60% among the elderly) • Otitis media	**Conjugate vaccine** • Local reactions (pain, swelling, or redness at injection site): 10 – 20%; • Fever: 15 – 24% (when vaccine administered at the same time as whole cell pertussis vaccine) **Polysaccharide vaccine** • Local reactions: 30 – 50% • Fever: 2% • Irritability, drowsiness, restless sleep, decreased appetite, headache, malaise may occur with conjugate or polysaccharide vaccine

Disease	Risks Associated with Disease	Adverse Events Associated with Vaccine
Varicella	• Secondary bacterial infections: 5 – 10% • Low platelets: 1 – 2% • Cerebellar ataxia: 1/4000 cases • Encephalitis:1/5000 cases • Invasive group A Streptococcal infection: 5/100,000 cases • Death (per 100, 000 cases): • Adults: 30 deaths • Infants < 1year old: 7 deaths • Children 1 -19 years old: 1 – 1.5 deaths • Otitis media, bacteremia, pneumonia, osteomyelitis, septic arthritis, endocarditis, necrotizing fasciitis, toxic shock-like syndrome • Reactivation of varicella virus as Herpes Zoster (shingles) later in life: 20% • Congenital varicella syndrome: up to 2% of fetuses born to mothers infected at 13-20 weeks gestation	• Varicella like rash at injection site: 3 – 5% after the first dose and 1% after a second dose • Small number of generalized varicella – like papules or vesicles: 5% after the first dose and 1% after a second dose • Fever: 10 – 15% • Local reaction (pain, swelling, and redness at injection site): 10 – 20% • Risk of zoster after vaccination: 2.6/100,000 vaccine doses • No deaths or congenital varicella have been attributed to vaccine

6.0 VACCINE IMMUNOGENICITY, EFFICACY, AND EFFECTIVENESS

Immunogenicity – the ability of an antigen (i.e., vaccine) to provoke an immune response in an individual.

Efficacy – the extent to which a vaccine provides a beneficial result under ideal conditions. The efficacy of a new vaccine is measured in phase III clinical trials by giving one group of people a vaccine and comparing the incidence of disease in that group to another group of people who do not receive the vaccine.

Effectiveness – the extent to which a vaccine provides a beneficial result under real-life conditions.

VACCINE	EFFECTIVENESS / EFFICACY / IMMUNOGENICITY
Diphtheria **Tetanus** **Pertussis**	• Diphtheria: 99% of people immunized with complete primary series develop protective antibody levels (antitoxin titres of > 0.1 IU/ml). • Tetanus: close to 100% (virtually all people immunized with full primary series achieve protective antitoxin levels). • Acellular Pertussis: estimated efficacy is approx. 85%.
Haemophilus *influenzae* type b	• Clinical efficacy: 95 – 100%.
Inactivated Polio	• Close to 100% of vaccine recipients develop protective antibody levels after three doses.
Hepatitis B	• Children < 2 years of age: 95% immune response rate. • Children 5 – 19 years of age: 99% seroprotection. • Adults ≥ 20 years of age: immune response declines with age (95% at 20 years of age and 50% – 70% at ≥ 60 years of age).
Human Papillomavirus (HPV)	• Seroconversion rates in adolescents > 99% for all 4 HPV vaccine types (i.e., 6, 11, 16, and 18). • 99% efficacy against CIN 2/3 (cervical cancer precancerous lesions) due to HPV types 16 and 18. • 99% efficacy against genital warts related to HPV types 6 and 11.

VACCINE	EFFECTIVENESS / EFFICACY / IMMUNOGENICITY
Influenza	• Effectiveness depends on age and immunocompetence of recipient and degree of similarity between virus strains included in the vaccine and circulating strains. • 70 – 90% efficacy in healthy children and adults. • Elderly: 56% effective in preventing respiratory illness; 50% effective in preventing hospitalization due to pneumonia; 68% effective in preventing death. • Facility residents: 30 – 40% effective against influenza illness; 50 – 60% effective against hospitalization and pneumonia; and 85 – 95% effective in preventing death. • Yearly vaccination is required.
MMR	• 85 – 95% of infants immunized with one dose of MMR at 12 – 15 months of age develop antibodies. • Close to 100% with two doses of MMR.
Meningococcal C conjugate	• Efficacy > 90%. • Immunogenic in infants and young children. • Induces immunologic memory.
Meningococcal quadrivalent conjugate	• Immunogenicity: 80% – 100% depending on age of recipient. • Demonstrated ability to boost antibody response to Meningococcal C conjugate vaccine.
Meningococcal quadrivalent polysaccharide	• Efficacy for serogroups A and C 85 – 100% among children ≥ 4 years of age and adults. • Vaccine effectiveness of 87 – 94% has been observed in children ≥ 2 yrs.
Pneumococcal conjugate	• Protective efficacy of 89 – 97% observed against invasive disease due to vaccine serotypes. • Effective in infants and young children. Induces immunologic memory.

VACCINE	EFFECTIVENESS / EFFICACY / IMMUNOGENICITY
Pneumococcal Polysaccharide	• 60 – 70% effective in preventing invasive disease caused by serotypes in the vaccine (> 80% in healthy young adults and 50 – 80% in the elderly and individuals with chronic illness).
Typhoid	• Efficacy of typhoid vaccine (oral and intramuscular formulations) in preventing typhoid is approximately 50%. • The injectable Vi capsular polysaccharide vaccine (ViCPS vaccine) is given intramuscularly in a single dose. Protection is induced about 7 days after the injection. In countries or areas at risk, the protective efficacy 1.5 years after vaccination is about 72%; after 3 years it is about 50%.
Varicella	• Children 12 months to 12 years of age: 98% seroconversion rate at 4 – 6 weeks post –immunization. • Adults and adolescents ≥ 13 years of age given 2 vaccine doses 4 to 8 weeks apart: 99% seroconversion rates at 4 – 6 weeks after the second dose. • Vaccine effectiveness 70% – 90% in preventing varicella disease of any severity and 95% protection against severe varicella for at least 7 to 10 years after immunization.
Varicella Zoster	• Efficacy in 4 years post immunization remains consistent and above 90% in all age groups • Immunogenicity response is the same across all age groups > 50 years • In studies that assessed vaccine immunogenicity antibody, the response to RZV (recombinant) was found to be more robust (independent of age and with more stable antibody concentrations over time) than the response to LZV (live attenuated).

7.0 DEFINITIONS

Acellular vaccine – the vaccine is made only from purified specific antigenic parts of a bacterium rather than the whole killed bacterium (e.g., acellular pertussis).

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.

Combination vaccine – vaccine that has been developed to protect against more than one type of infection (e.g., INFANRIX hexa®, Quadracel®).

Conjugate polysaccharide vaccine – 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).

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

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 inapparent or very mild.

Primary series – an initial series of vaccinations designed to give a primary antibody response. The series may be followed by an additional booster dose(s) to give a secondary immune response. (e.g., first 3 doses of DTaP- HB – IPV- Hib Vaccine – INFANRIX hexa® at 2, 4, and 6 months followed by the booster dose at 18 months).

Pure polysaccharide vaccine – vaccine produced from the polysaccharide (sugar) coating of an encapsulated bacterium (e.g., pneumococcal and meningococcal polysaccharide vaccines).

Recombinant vaccine – vaccine produced by genetic engineering technology (e.g., Hepatitis B vaccine is produced by the insertion of the segment of the viral gene that makes the surface protein of a hepatitis B virus into the gene of a yeast cell. The yeast cells are then instructed to make surface protein by the viral gene.)

Toxoid – a deactivated form of a bacterial toxin which has been chemically processed so that it is still immunogenic (e.g., tetanus toxoid). Once the toxin has been inactivated, it is called a toxoid.

8.0 IMMUNOGENIC COMPONENTS OF SELECTED VACCINES

Vaccine		Active Components
Diphtheria, Tetanus, acellular pertussis, HepatitisB, Inactivated Polio, conjugated *Haemophilus influenzae* type b	**INFANRIX hexa®**	25 Lf diphtheria toxoid 10Lf Tetanus toxoid 25 µg Pertussis toxoid 25 µg Filamentous haemagglutinin (FHA) 8µg Pertactin 10µg Hepatitis B surface antigen Inactivated polio virus: 40 D-antigen units of type 1 (Mahoney strain), 8 D-antigen units of 2 (MEF-1 strain), and 32 D-antigen units of type 3 (Saukett strain) 10 µg of Hib polyribosylribitol phosphate (PRP) capsular polysaccharide conjugated to 25 µg of tetanus toxiod
Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio, conjugated *Haemophilus influenzae* type b	**PEDIACEL®**	15 Lf Diphtheria toxoid 5 Lf Tetanus toxoid 20 µg Pertussis toxoid 20 µg Filamentous haemagglutinin (FHA) 5 µg Fimbriae (Types 2 + 3) 3µg Pertactin Inactivated polio virus: 40 D-antigen units of type 1 (Mahoney strain), 8 D-antigen units of type 2 (MEF-1 strain), 32 D-antigen units of type 3 (Saukett strain) 10µg of Hib polyribosylribitol phosphate (PRP)capsular polysaccharide conjugated to 18-30 µg of tetanus toxoid
Tetanus, Diphtheria, acellular pertussis	**BOOSTRIX®**	5 Lf Tetanus toxoid 2.5 Lf Diphtheria toxoid 8 µg Pertussis toxoid 8 µg Filamentous haemagglutinin (FHA) 2.5 µg Pertactin

Vaccine		Active Components
Tetanus, Diphtheria, Acellular Pertussis, Polio (Tdap-IPV)	**ADACEL®-POLIO**	5 Lf tetanus toxoid 2 Lf diphtheria toxoid 2.5 µg pertussis toxoid 5 µg filamentous haemagglutinin 5 µg fimbriae types 2 and 3 3 µg pertactin Inactivated polio virus: 40 D-antigen units of type 1 (Mahoney strain), 8 D-antigen units of type 2 (MEF-1 strain), and 32 D-antigen units of type 3 (Saukett strain)
Tetanus, Diphtheria, Polio (Td/IPV) Td Polio Adsorbed	**Td Polio Adsorbed**	Lf tetanus toxoid 2 Lf diphtheria toxoid Inactivated polio virus: 40 D-antigen units of type 1 (Mahoney strain), 8 D-antigen units of type 2 (MEF 1 strain), and 32 D-antigen units of type 3 (Saukett strain)
Tetanus, Diphtheria (Td)	**Td Adsorbed**	5 Lf tetanus toxoid 2 Lf diphtheria toxoid
Polio (IPV)	**IMOVAX® POLIO**	Inactivated polio virus: 40 D-antigen units of type 1 (Mahoney strain), 8 D-antigen units of type 2 (MEF-1 strain), and 32 D-antigen units of type 3 (Saukett strain)
Rabies	**IMOVAX® Rabies**	≥ 2.5 IU/1 mL rabies virus (WISTAR Rabies PM/WI 38 1503-3M strain)
Haemophilus influenzae type b (Hib)	**Act-HIB®**	10 µg of Hib polyribosylribitol phosphate (PRP) capsular polysaccharide bound to 18-30 µg of tetanus protein
	HIBERIX®	10 µg of Hib polyribosylribitol phosphate (PRP) capsular polysaccharide covalently bound to approximately 25 µg of tetanus toxoid
Hepatits A (HA)	**HAVRIX® 1440**	1440 ELISA units/1 mL of inactivated hepatitis A virus
	HAVRIX® 720	720 ELISA units/0.5 mL of inactivated hepatitis A virus
	VAQTA®	Adult presentation: 50 U/1 mL of hepatitis A virus protein • Pediatric presentation: 25 U/0.5 mL of hepatitis A virus protein

Vaccine		Active Components
Hepatitis A and B Combined (HAHB)	**TWINRIX®**	720 ELISA units inactivated hepatitis A virus and 20 µg hepatitis B surface antigen per 1 mL
	TWINRIX® Junior	360 ELISA units inactivated hepatitis A virus and 10 µg hepatitis B surface antigen per 0.5mL
Hepatitis B	**Engerix®-B**	• Adult presentation: 20 µg/1.0 mL of hepatitis B surface antigen • Pediatric presentation: 10 µg/0.5 mL of hepatitis B surface antigen
	RecombivaxHB®	• Adult presentation: 10 µg/1.0 mL of hepatitis B surface antigen • Dyalysis presentation: 40 µg/1.0 mL of hepatitis B surface antigen • Pediatric presentation: 5 µg/0.5 mL of hepatitis B surface antigen
HPV	**Gardasil®**	30 µg HPV type 6 L1 protein 40 µg HPV type 11 L1 protein 60 µg HPV type 16 L1 protein 40 µg HPV type 18 L1 protein 20 µg HPV type 31 L1 protein 20 µg HPV type 33 L1 protein 20 µg HPV type 45 L1 protein 20 µg HPV type 52 L1 protein 20 µg HPV type 58 L1 protein
Meningococcal B (Men B)	**BEXSERO®**	50 µg Neisserial heparin binding antigen fusion protein 50 µg Neisseria adhesin A protein 50 µg factor H binding protein fusion protein 25 µg outer membrane vesicles containing Por A protein from N. meningitidis serogroup B
Menningococcal C – Conjugate (Men – C-C)	**Neis Vac-C®**	10 µg meningococcal C polysaccharide conjugated to 10-20 µg diphtheria toxoid carrier

Vaccine		Active Components
Vaccine		**Active Components**
Meningococcal Quadrivalent Conjugate (Men-C-ACYW-135)	**MENACTRA®**	4 µg each of meningococcal A, C, Y, and W-135 polysaccharides conjugated to approximately 48 µg diphtheria toxoid protein carrier
	MENVEO®	5 µg each of meningococcal C, W-135, and Y oligosaccharides and 10 µg of meningococcal A oligosaccharide conjugated to approximately 47 µg of diphtheria CRM197 protein
	NIMENRIX®	5 µg each of meningococcal A, C, Y and W-135 polysaccharides conjugated to 44 µg of tetanus toxoid carrier protein
Pneumococcal	**Prevnar®13**	2 µg of each saccharide for types 4, 9V, 14, 18C, 19F, and 23F and 4 µg of serotype 6B, individually conjugated to diphtheria CRM197 protein
	Pneumovax® 23	25 µg each of the following serotypes of *streptococcus pneumoniae*: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, 33F
Varicella	**Varivax® III**	1350 plaque forming units (PFU) of Oka / Merck varicella virus
	Varilrix®	≥ 103.3 PFU Oka strain varicella virus
Zoster	**SHINGRIX®**	50 µg varicella zoster virus glycoprotein E
	ZOSTAVAX® II	≥ 19,400 PFU varicella zoster virus (Oka/Merck strain)

9.0 NON-IMMUNOGENIC COMPONENTS OF VACCINES

Adjuvants:

- Any substance added to a vaccine to enhance the immune response by degree or duration making it possible to reduce the amount of antigen per dose or the total number of doses needed to achieve immunity.
- The only adjuvants used in vaccines in Canada are aluminum salts (e.g., aluminum hydroxide, aluminum phosphate, or potassium aluminum sulfate).
- Adjuvants containing aluminum are found in many vaccines, including INFANRIX hexa®, PEDIACEL®, Prevnar®, and ADACEL®.

Preservatives:

- Chemicals added to multi-dose, killed, or subunit vaccines to prevent serious secondary infections as a result of bacterial or fungal contamination of the vaccine. [e.g., thimerosal (found only in some influenza vaccines and adult preparations of hepatitis B vaccine); 2 phenoxyethanol in PEDIACEL®; phenol in Pneumo-23™].

Antibiotics❶:

- To prevent contamination during viral cell culture (e.g., neomycin in MMR II™; polymyxin B in TdP).
- Egg/yeast proteins, glycerol, serum, amino acids, and enzymes ❶:
- Needed for growth of viruses

Formaldehyde❶:

- To inactivate viruses and protein toxins (e.g., in PEDIACEL®, Td, IPV). The amount of formaldehyde remaining in a vaccine after the completion of the manufacturing process is less than that found naturally (continuously present in the blood, or turned over in a day) in the human body.

Stabilizers:

- To help protect the vaccine during the manufacturing process (i.e., to control acidity (pH); stabilize antigens through necessary steps in the manufacturing process; and prevent antigens from sticking to the sides of glass vials) (e.g., gelatin in MMR II™, Polysorbate 20 and 80 in INFANRIX hexa®, potassium or sodium salts, lactose, human serum albumin, and a variety of animal proteins such as gelatin and bovine serum albumin).

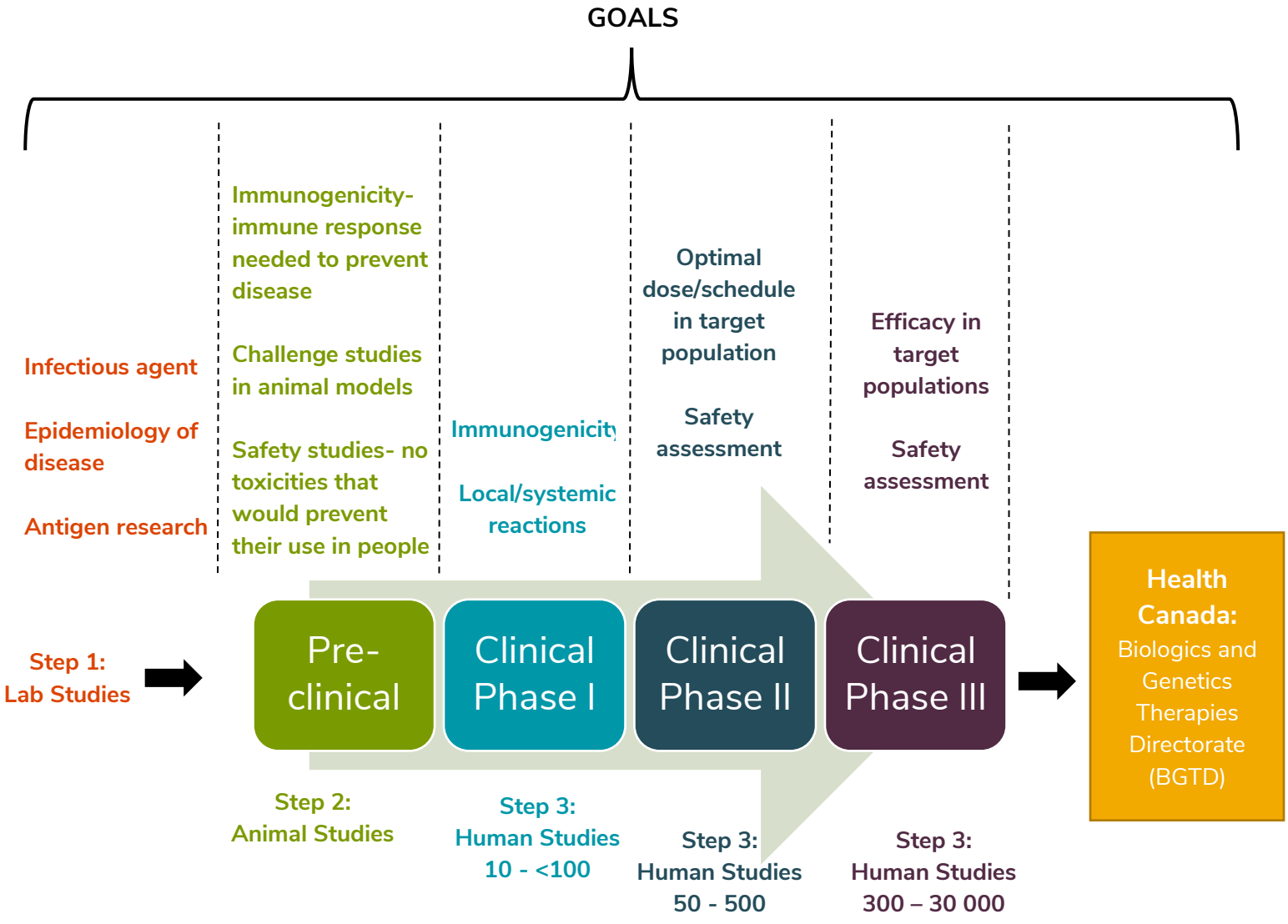
❶*Most of these reagents are removed during the manufacturing process but "minute" amounts may remain in the final product.*

10.0 VACCINE DEVELOPMENT AND LICENSING

10.1 VACCINE DEVELOPMENT

- Vaccines must be thoroughly tested before they can be called safe and effective for human use.
- It can take up to 10 years to test and develop a vaccine.
- Table 2.0 describes the stages of vaccine development from the lab to Health Canada approval.

Table 2.0 Stages of Vaccine Development

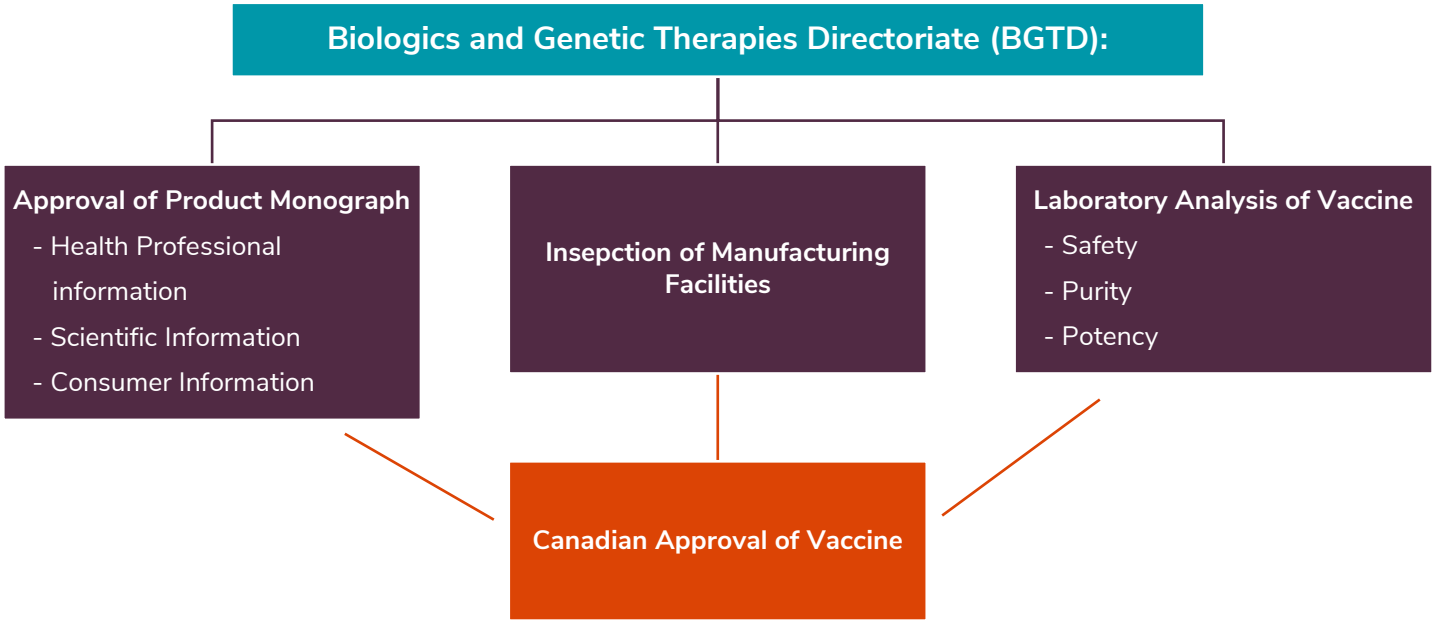


10.2 CANADIAN VACCINE LICENSING

When the pharmaceutical company has successfully conducted the lab studies, animal studies, and human studies, the vaccine must meet Canadian licensing standards before the vaccine can be considered for use in Canada (8).

The Biologics and Genetic Therapies Directorate (BGTD) under Health Canada is the Canadian authority that regulates biological drugs (products derived from living sources) for human use (8).

Table 3.0 Canadian Vaccine Licensing



11.0 HISTORY OF IMMUNIZATION & IMMUNIZATION PROGRAMING IN YUKON

1955 SALK, inactivated poliomyelitis vaccine introduced

1962 Tuberculosis control program included routine tuberculin skin testing of all students

1963 BCG, Bacille Calmette Guerin, live tuberculosis vaccine introduced

1963 SABIN, oral live attenuated poliomyelitis vaccine introduced

1964 LIRUGEN, live attenuated measles vaccine introduced

1970 Rubella, live attenuated vaccine introduced

1973 Mumps, live attenuated vaccine introduced

1974 MMR, live attenuated measles, mumps, rubella vaccine provided for children at 12 months of age and older

1977 TABT (Typhoid, Paratyphoid A &B, Tetanus vaccine) discontinued

1978 Smallpox vaccine no longer part of the routine schedule, as a result of WHO eradication program

1978 Influenza split-virus vaccine program introduced for at risk population

1978 Infant immunization program routinely gave primary series of diphtheria, pertussis, tetanus and poliomyelitis vaccine at 3, 4, 5 months of age

1979 Primary series of DPTP given at 2, 4, 6 months

1980 Tuberculin skin testing in the school population, to establish baseline tuberculin for grade one students only

1980 Smallpox vaccine no longer administered, World Health Organization announced official global eradication of smallpox

1981 DTP, DT and Td adsorbed vaccines introduced increased antigenicity extended the recommended period of time between booster doses from 5 to 10 years

1982 Hepatitis B immune globulin (HBIG) available

1983 HEPTAVAX (plasma-derived) Hepatitis B vaccine provided to neonates of HBSAg positive mothers

1984 HEPTAVAX (plasma-derived) Hepatitis B vaccine provided to healthcare workers by Federal Public Service Health

1984 BCG vaccine no longer administered routinely to newborns

1984 Canadian Immunization Guide from the National Advisory Committee on Immunization distributed for the first time

1985-86 Second dose of Rubella vaccine (including MERUVAX II) for girls (10 11 years of age)

1986 Measles outbreak in the Yukon (and several places across Canada) Measles vaccine campaign launched

1986 Haemophilus influenzae type b polysaccharide vaccine (HIB VAX) first provided to children age 2 to 5 years of age

1987 Recombinant Hepatitis B vaccine (ENGERIX B) provided

1988 Haemophilus influenzae type b vaccine – conjugate (ProHIBit) provided to children age 18 months to 5 years of age

1988 Tuberculin skin testing, 250 TU discontinued

1988 Pneumococcal polysaccharide vaccine (PNEUMOVAX 23) for seniors and people at risk

1991 Yukon Region (Health Canada) Innoculist Certification Exam of Immunization implemented

1991 Cholera vaccine no longer recommended

1991 Routine tuberculin skin testing in schools discontinued

1991 World Health Organization designates Whitehorse Health Centre as Yellow Fever Vaccination Centre for the entire Yukon

1991 Influenza vaccine program expanded because of concern of pandemic season, vaccine uptake tripled

1992 WHO, no requirement for certificate of vaccination against cholera

1992 Haemophilus influenzae type b vaccine – conjugate (Act-HIB) for children 2 months – 5 years of age

1993 Postpartum rubella immunization program using MMR initiated

1993 BCG vaccination no longer used for routine use, but recommended for those at special risk for tuberculosis

1994 Japanese Encephalitis Vaccine introduced

1994 Typhoid polysaccharide vaccine, TYPHIM Vi introduced. Typhoid, live oral vaccine licensed in Canada. Prescribed by physician, dispensed by pharmacist, self administered

1994 Hepatitis A vaccine, recombinant HAVRIX 720, routinely used as prophylaxis. Immune serum globulin discontinued for routine hepatitis A prevention

1994 Hepatitis b vaccine (ENGERIX B) series introduced for Grade 4 students

1995 Pentavalent vaccine provided (diphtheria, pertussis, tetanus, polio, conjugate haemophilus influenzae type b) DPT/IPV/ActHIB introduced Live Oral Poliovirus Vaccine phased out

1995 Tuberculin PPD-S 5TU (Standard Test Solution) introduced, 1TU discontinued

1996 Second dose of MMR vaccine (measles, rubella, mumps) introduced at age 18 months as part of the routine schedule

1996 Second dose of measles vaccine, mass campaign in the schools

1997 Hepatitis A vaccine, HAVRIX 1440 introduced

1997 Acellular pertussis combination vaccines introduced , ie. PENTA discontinued, PENTACEL used in routine schedule

1997 Hepatitis A vaccine, VAQTA introduced for at risk clients

1998 Policy regarding publicly funded vaccines for specific conditions included recommendations for clients with: Hepatitis N Hepatitis B/ Hepatitis C/ HIV positive Asplenia / Hodgkin's disease

1998 Hepatitis B vaccine (RECOMBIVAX HB) introduced into infant immunization schedule, catch-up clinics for preschoolers

1998 Tuberculin skin testing, one-time-only survey of grade one student's in Whitehorse

1998 Hepatitis B vaccine (RECOMBIVAX HB) for students in grades 1 – 4, last school-based series

1999 Influenza vaccine, publicly funded eligibility expanded to 18 years of age and older

1999 RECOMBIVAX HB, adult dialysis presentation, 40 mcg/mL is offered to hemodialysis patients only

2000 Influenza vaccine season included reporting of Oculo-Respiratory Syndrome (ORS) nationwide

2001 Meningococcal A,C,Y,W-135 vaccine recommended by post secondary institutions for students attending from out of province

2002 Varicella vaccine (VARIVAX II) introduced for high risk clients

2002 Hepatitis B vaccine, publicly funded for clients up to19 years of age and at risk groups

2003 Immunization Competence Exam revised

2003 Varicella vaccine (VARIVAX III) introduced for high risk clients

2003 Hepatitis B vaccine series as 2-dose regimen for adolescents 11 15 years of age introduced

2003 Thimerosal-free RECOMBIVAX HB for infants/children Pneumococcal 7- valent conjugate vaccine(PREVNAR) available Meningococcal C conjugate vaccine (MENJUGATE) available

2003 DUKORAL, oral Cholera/E coli vaccine available without prescription and self administered

2004 Acellular pertussis for adolescents/adults available as Tdap vaccine, i.e. ADACEL given, TdPOLIO discontinued as grade 9 booster. Three year Tdap (ADACEL) study completed with Health Canada

2004 Monovalent meningococcal group C conjugated vaccine offered to students attending out of Territory post secondary institutions

2004 Flu vaccinations are provided free of charge to Yukon residents. Influenza vaccine program expanded to include pregnant women in their last trimester of pregnancy, and infants between ages 6 to 23 months

2004 Meningococcal C conjugate vaccine: NEIS VAC C "A new simple 2 dose immunization schedule for high risk infants" available

2005 Immunization Competence exam revised

2005 iPHIS (integrated Public Health Information System) electronic recording introduced Territory wide. iPHIS Orientation Manual introduced

2005 Pneumococcal 7 conjugated vaccine for all infants two months of age and up to 59 months introduced

2005 Meningococcal C conjugated vaccine introduced for: routine infant program all students graduating from high school all students currently attending post secondary schools

2006 Meningococcal C conjugated vaccine offered to grade 9 students in preparation for Canada Winter Games

2006 Immunization Competence exam revised

2007 Varicella vaccine for infants 6- 23 months introduced

2007 HPV vaccine available for females 9-26 years. Not funded at public expense

2007 Meningococcal C school program 14- 16 years integrated with Tdap program

2007 Canadian Immunization Guide (2006) 7th Ed released

2007 Immunization Competence exams revised

2007 iPHIS (integrated Public Health Information System) electronic recording introduced at Kwanlin Dun Health Centre

2007 Community Health Immunization Workplan complete

2008 iPHIS (integrated Public Health Information System) electronic recording introduced at Whitehorse General Hospital for the Employee Health Program

2008 Transfer of responsibility of Vaccine Program from YCDC to Community Nursing

2008 Introduction of Menactra (Meningococcal A,C,Y,W-135) for foreign travel program and for at risk clients.

2008 Adoption of NACI recommendations for use of Pneumococcal Polysaccharide for Homeless and Illicit Drug Users

2009 National Immunization Competencies for Health Professionals released by the Public Health Agency of Canada at the Canadian Immunization Conference

2009 Updated HBIG guidelines initiated. HBIG stocked in the rural facilities of: Beaver Creek, Old Crow, Watson Lake, Haines Junction, Dawson City, Mayo and Ross River

2009 Pneumococcal 10 conjugated replaces Pneumococcal 7 conjugated vaccine for all infants two months of age and up to 24 months. Children started on Pneumococcal 7 complete series with Pneumococcal 7

2009 HPV immunization program introduced. School based program grades 6. Catch up for grades 7 & 8 in school year 2009-2010 only. Free to all females ages 9 26 years

2009 H1N1 Pandemic – Mass immunization Program- Panvax (pregnant females), Arepanrix (general public) Immunizations available to all Yukoners

2009 Pneumococcal Polysaccharide 23 high risk groups updated

2009 Immunization Competence exams revised

2010 Hepatitis B vaccine shortage. Combined Hepatitis A & Hepatitis B product TWINRIX available in Yukon

2010 Zoster Vaccination (Zostavax) approved for use in Canada, for those over the age of 60 years. Available to Yukoners, -not publicly funded

2010 School based HPV catch-up program extended for 2010-2011 school year HPV offered in the school for females in grades 7 & 8

2010 Pneumococcal 13 conjugated replaced. All children completed series already initiated on Pneumococcal 7 or 10. One dose catch-up for all children under 59 months of age who completed their Pneumococcal series with either 7 or 10 valiant vaccine

2010 Clarification of Pertussis dosing intervals. One dose of Tdap in adulthood publicly funded

2011 May 2011 Pneumococcal conjugate routine schedule changed from a 4 dose to a 2+1 routine childhood schedule. High risk clients remained with the 4 dose schedule

2011 HPV available to boys aged 9-26 years – not publicly funded. School program delivered in Grade 6, 7, 8 this year. HPV vaccine continues to be available free of charge for girls between the ages of 9 and 26 but not licensed for anyone over 26 years of age.

2011 Introduction of INFANRIX hexa® vaccine May 2, 2011 – diphtheria, tetanus, acellular pertussis, hepatitis B, poliomyelitis (polio) and Haemophilus influenza type b (Hib). New schedule adjusted for combined vaccine.

2011 April 2011 adult hepatitis B vaccine products change from Merck Frosst Recombivax HB® to GSK Engerix®-B. Interchangeable using the age-specific dosage and recommended schedule for the respective product.

2011 April 2011 Introduction of Informed Consent for Immunizations guidelines

2011 Harmonization of the BC & YT routine immunization schedules for those under 19 years to support implementation of Panorama. Multiple changes. *Community Health Nursing Program Manual Volume 2 & 3 retired. New manual issued* May 2, 2011: *Community Nursing Yukon Immunization Program Manual*. Children who began their primary series with Pediacel® will complete with Pediacel®. Meningococcal C conjugate (NiesVac-C®) low risk infants 2 dose series and are considered to be up to date if the second dose was administered on or after 12 months of age. Hepatitis B dosage of Recombivax HB® 5 µg = 0.5 mL for all infants. If started with Recombivax HB® finish with same product.

2011 May 2011. Catch up targeting those in grade 6-12 for Tdap, meningococcal C, and MMR prior to Arctic Winter Games occurring March 4th to 10th, 2012. Ensure all health center staff's immunizations are up to date.

2011 June 2011 MMR Outbreak in Quebec and clarification on the administration of MMR vaccine. MMR is not limited to travelers. Take every opportunity to update all.

2011 June 2011 Menveo® replaces Menactra® when meningococcal quadravalent is indicated but the age range for usage differs. Clarification for tetanus dose count in IPHIS to be reset to dose #1 for the Grade 9 dose.

2011 June 2011/2012 School Program is to be completed by December 31, 2011. This includes Grad 6 HPV for girls only; Grade 6-7 meningococcal C and MMR; Grade 8-9 Tdap, meningococcal C, and MMR; Grade 10-12 Formal Catch-up Tdap, meningococcal C, and MMR. For Flu Program 2011-2012 offer Pneumococcal 23 and Tdap to all eligible clients.

2011 September 2011 HPV Gardasil® vaccine available to women ages 27-45 as non publically funded. Gardasil® continues to be publically funded for females ages 9-26.

2011 September 2011 Zostavax® licensed for ages ≥ 50 years. Only available in frozen form in Whitehorse so will therefore not be available to any rural communities.

2011 September, changes to the FLUVIRAL® Influenza Vaccine for 2011-2012: dosage for infants 6-35 months is 0.5 mL one or two doses depending on whether a dose has been received in a previous year, mild egg allergy is not a contraindication.

2012 April 1, publically funded HPV program for all girls ≥9 years to ≤ 18 years only. Those ≥19 years to ≤ 26 years, who started their immunization series prior to April 1, 2012 (while the immunization was publically funded for thisgroup) the remainder of the series is publically funded. HPV still available for boys aged 9-26 years & girls and women ≥19 years to ≤ 45 years – at cost to client

2012 2 dose Varicella immunization program introduced, in the routine infant schedule. Second dose at school entry (4-6 years). No formal catch-up.

2012 MMR dose #2 moved from 18 months to school entry (4-6years)

2012 Introduction of Tdap-IPV for school entry (4-6 years) booster

2012 Addendum – Interim Pertussis Immunization Strategy Introduced May 28th

2012 Definition of Adulthood for dose of acellular pertussis changed from 14 years of age to 19 years

2012 Oct 1, Introduction of routine infant Rotavirus program at 2 & 4 months.

2013 February 14, Vaccine Program moved from Community Nursing to Community Health Programs and the office relocated to 305 Jarvis Street in Whitehorse

2013 February, New Communicable Disease Guidelines on Measles and Rubella released.

2013 March 25, Tubersol in short supply nationally

2013 April 29, Interim Pertussis Immunization Strategy finishes

2013 May 23, HPV Program funding changes to be publically funded for females in grade 6 and ages 13-18 years old

2013 August 6, Pneumococcal conjugate available to HIV clients of any age following High Risk schedule.

2013 Varicella Vaccine (VARIVAX III) shortage and programing reserved for susceptible populations until Sept 16, 2013

2013 October, New Communicable Disease Guidelines on Varicella Zoster released

2013 FLUMIST (Trivalent Intranasal Live Attenuated Influenza vaccine) introduced in Whitehorse only as a pilot in the fall and available for 2 to 17 years of age

2013 October 22, Interim TB management strategies start

2013 Jan 16, VAXIGRIP Influenza vaccine product introduced

2014 June, New Yukon Communicable Disease Control – TB Control Manual released

2014 July, New Communicable Disease Guidelines on Hepatitis B released. HBIG stocked in the rural facilities of: Old Crow, Watson Lake, and Dawson City

2014 September 4, MMR algorithm updated. Rabies vaccine available by ID route to certain clients

2014 Fall, Intranasal Live Attenuated Influenza Vaccine introduced in all facilities as FLUMIST Quadrivalent Vaccine

2014 September 22, Egg allergy no longer a contraindication to inactivated Influenza vaccine

2014 November 27, IPHIS converted to read-only version for frontline workers

2014 December 1, Panorama goes live and is activated territory wide replacing IPHIS

2014 December, ZOSTAVAX available in refrigerated form –available to all facilities.

2015 February 2, HPV two dose schedule for females 9-14 years of age. Meningococcal B vaccine BEXSERO® product added and is for contact cases only, under the direction of CMOH.

2015 February 12, clarification when Panorama is not available (system is down) the only vaccine that can be given at this time is influenza vaccine.

2015 March 19, Menjugate® product added, 3 dose series for routine infant program. MMRV ProQuad® product added, for school entry only, as second dose @ 4 to 6 years of age. Children who have had a Tetanus, Diphtheria, and Pertussis combined vaccine (Tdap) at 10 years of age, or older are considered up to date and do not require an additional dose of Tdap in grade 9.

2015 June 15, Hepatitis A Pediatric vaccine product availability change. VAQTA® replacing Havrix® 720 Junior, only for 6 months to 17 years of age.

2015 June 25, revised schedule for dose 3 of Menjugate® to be given at 2, 6, and 12 months for the meningococcal C infant schedule.

2015 Yukon Immunization Certification Process change: *Flu, Tdap, Pneumococcal Polysaccharide Adult Only Exam* no longer available and Flu only recertification is to be done annually.

2015 2015-2016 Seasonal influenza vaccine products Fluzone® Quadrivalent and FluMist® Quadrivatlent.

2015 September 18, Menomune® indication change to only use if client is high risk and when the use of meningococcal quadrivalent conjugate or meningococcal C conjugate vaccine is contraindicated. Pneumococcal conjugate vaccine indication change for anatomic or functional asplenia for children up to and including 18 years of age. Pneumococcal conjugate vaccine recommendation based on authorization from physician and/or CMOH for children up to 18 years of age (inclusive) with asthma which required medical attention in the past 12 months. Pneumococcal conjugate vaccine for adults with specific conditions with recommendation based on authorization from Physician and/or CMOH. Once only revaccination interval for children and children with HIV changed from 3 years to 5 years. Pneumovax23® product is only product available in Canada.

2015 October 1, HPV changes: dosage change to male program for ages 9-14 from 3 dose to 2 dose (non-publically funded program), males ages 15-26 for 3 dose schedule (non-publically funded program).

2016 May 12, Menjugate® 3 dose series, will be phased out starting April 2016 and NeisVac-C®, 2 dose series, meningococcal C vaccine, as routine series.

2016 April 29, High risk meningococcal C eligible client will receive a meningococcal quadrivalent product instead of meningococcal C monovalent. Meningococcal C age expanded to adolescents and adults up to 24 years of age inclusive, who have not received a dose of Men-C-C containing vaccine at 10 years of age or older. Varicella reporting for clients born 2007 or later require a health care provider diagnosed history for reliability.

2016 June 28, Changes to school program starting Fall 2016-2017: meningococcal C vaccine no longer offered in grade 6, meningococcal quadrivalent ACY-W135 will be offered for adolescents born on or after January 1, 2002 and who are in grade 9.

2016 September 7, a 1mL of dose of adult formulation of Havrix®1440 should be used for those 16 - 18 years of age to address the licensing gap between Havrix®1440 and VAQTA® pediatric when these are the only available products.

2016 2016-2017 Seasonal influenza vaccine products FluLaval®Tetra (quadrivalent) and FluMist® Quadrivalent. Changes to the program this year: poultry workers added to high risk groups, and LAIV can safely be administered to egg allergic individuals. LAIV is not preferential choice for 2-17 year olds; it is as effective as inactivated influenza vaccine.

2017 January, Yukon Immunization Program Certification exam, format changed to multiple choice.

2017 June, update on Oral Polio Vaccine (OPV): Any dose of OPV received on or after April 1, 2016 will not be considered as a valid dose.

2017 September, Gardasil®9 replaces Gardasil®, Grade 6 school program expanded to include boys (no catch up program), as well as males meeting certain high risk criteria.

2017 October, SYNAGIS® no longer requires reconstitution, the product is now available in a pre-mixed solution.

2018 March, RotaTeq® 3 dose series added as a product to routine schedule.

2018 March, Hepatitis B vaccine – changed to Engerix-B for Adult and Pediatric formulations.

2018 March, MMRV vaccine – changed to Priorix-Tetra.

2018 May, Tdap is offered during each new pregnancy.

2018 June, referrals from OB/GYN specialists for HPV9 vaccine to go through YCDC or Rural Yukon Health centers upon receipt of a prescription from the specialist.

2019 2019-2020 Seasonal influenza vaccine product is Fluzone® Quadrivalent. FluMist® Quadrivalent not available in Canada due to shortage of an active ingredient.

2020 Immunization Certification changed to online format via YGLearn platform

2020 September: Yukon Pharmacists certified to immunize with Yukon publicly funded influenza vaccine

2021 January 2021, SHINGRIX introduced into publicly funded system for Yukon residents aged 65-70. HPV publically funded program expanded to all eligible Yukoners up to age 26.

2021 January 4, 2021, First COVID-19 vaccine administered in Yukon

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