PRODUCT MONOGRAPH

PNEUMO® 23

Pneumococcal Polysaccharide Vaccine

Dosage Form: 1 Dose (0.5 mL Prefilled Syringe)

Solution for Injection

Active Immunizing Agent

(For the Prevention of Pneumococcal Infections)

Approved: July 18, 2008

Control# 121307

Manufactured by:
Sanofi Pasteur SA
Lyon, France

Distributed by:
Sanofi Pasteur Limited
Toronto, Ontario, Canada

DATE OF Revision:
April 2008

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CLINICAL PHARMACOLOGY

PNEUMO 23® [Pneumococcal Polysaccharide Vaccine] is a capsular polysaccharide vaccine against disease caused by 23 of the most common serotypes of *Streptococcus pneumoniae* (pneumococcus).

S. pneumoniae causes invasive bacterial infections including primary bacterial pneumonia, meningitis, and bacteremia. (1) Invasive disease is most common in the very young, the elderly and in certain specific groups at high risk, such as individuals with functional or anatomic asplenia and congenital or acquired immune deficiency. (2) Given that not every case of invasive pneumococcal disease would have had cultures taken before starting antibiotics, these estimates likely represent the minimum incidence rates. (3) Population surveillance data from 9 selected health units across Canada show that the age-specific incidence of invasive pneumococcal disease

is greatest in children <5 years of age (55.3 cases per 100,000) and in persons ≥65 years of age (46.4 cases per 100,000). Ninety-four percent of cases were caused by serotypes contained in the 23-valent pneumococcal vaccine. (4) Other Canada-wide estimates suggest that approximately 90% of cases of pneumococcal bacteremia and meningitis are caused by these 23 types. Penicillin-resistant strains generally appear in serotypes included in the vaccine and have become more common in Canada, increasing from 2.5% in 1991 to 11.3% in 1998. (5) The six serotypes that most often cause drug-resistant invasive pneumococcal infection are included in this vaccine. (2) The overall case fatality rate from invasive pneumococcal disease is 11% increasing to 20% for those in the ≥65 age group. (1)

Efficacy of pneumococcal polysaccharide vaccine is in the range of 50 to 80% among the elderly and in specific patient groups such as those with diabetes mellitus, anatomic or physiologic asplenia, congestive heart failure or chronic pulmonary disease. (2) (6) Pneumococcal polysaccharide vaccine is not indicated for children ≤2 years of age; however, it may broaden serotype coverage for high-risk children ≥2 years of age. (3) (7) Although the duration of immunity is not precisely known, serotype-specific antibody levels appear to decline after 5 to 10 years, decreasing more rapidly in some groups than others. (2)

In clinical studies involving more than 1,000 volunteers, serum capsular polysaccharide antibodies start to increase 10 to 15 days following immunization with PNEUMO 23®. (8) Clinical trials with PNEUMO 23® vaccine have shown that healthy adults develop excellent antibody responses following pneumococcal vaccination: 80% or more of subjects develop at least a two-fold rise in antibody levels, inducing IgG and IgM antibodies in individuals immunized intramuscularly. (8) (9)

In a clinical trial conducted in The Gambia, 150 women in the third trimester of pregnancy received either PNEUMO 23® (n = 75) or a control vaccine (n = 75). No significant side effects were recorded among vaccinated women except soreness at the injection site. Rates of stillbirth (1 in the PNEUMO 23® group and 3 in the control vaccine group) were less than might have been expected in the community. (10) In a clinical trial conducted in Papua New Guinea, 235 women received PNEUMO 23® at 28-38 weeks gestation. A control group of 202 was unimmunized. There were no excess stillbirths in the vaccinated group and no differences in mortality rates during infancy between babies of immunized and unimmunized mothers. (11)

INDICATIONS AND CLINICAL USE

PNEUMO 23® [Pneumococcal Polysaccharide Vaccine] is indicated in persons two years of age or older for the prevention of invasive infection, such as bacteremia, pneumonia or meningitis, caused by the serotypes of pneumococci contained in the vaccine.

A single dose of pneumococcal polysaccharide vaccine is recommended for all individuals ≥65 years of age including those with unknown vaccination histories. (2)

In accordance with the National Advisory Committee on Immunization (NACI), pneumococcal polysaccharide vaccine is recommended for individuals ≥5 years of age who are at high risk of invasive pneumococcal infection including:

- individuals with asplenia, splenic dysfunction or sickle cell disease (2)
- individuals with chronic cardiorespiratory disease (except asthma) (2)
- individuals with cirrhosis, alcoholism, chronic renal disease or nephrotic syndrome (2)

- individuals with chronic cerebrospinal fluid leak (2)
- individuals with diabetes mellitus (2)
- individuals with HIV infection and other chronic conditions associated with immunosuppression (Hodgkin's disease, lymphoma, multiple myeloma, immunosuppression for organ transplantation) (2)
- candidates for and recipients of cochlear implants (12)

Where possible, the vaccine should be given at least 10 to 14 days before splenectomy or initiation of chemotherapy or immunosuppressive therapy or early in the course of HIV infection. (2)

Pneumococcal polysaccharide vaccine should also be given to smokers who are at increased risk of pneumococcal infection. (2)

Children from 2-5 years of age who have previously been immunized with a pneumococcal conjugate vaccine may receive pneumococcal polysaccharide vaccine both as a booster dose and to increase the serogroup coverage. (2) (See DOSAGE AND ADMINISTRATION.)

History of a confirmed or suspected pneumococcal infection is not a contraindication and should be considered according to underlying risk status. PNEUMO 23® is not recommended for prevention of recurrent upper respiratory tract infections, particularly otitis media and sinusitis.

Children who have experienced invasive pneumococcal disease should receive all recommended doses of pneumococcal vaccine appropriate for their age and underlying condition. (3)

Revaccination should be considered in some individuals. (See DOSAGE AND ADMINISTRATION.)

CONTRAINDICATIONS

Immunization with PNEUMO 23® [Pneumococcal Polysaccharide Vaccine] should be deferred in the presence of any acute illness, including febrile illness, to avoid superimposing adverse effects from the vaccine on the underlying illness or mistakenly identifying a manifestation of the underlying illness as a complication of vaccine use. A minor illness such as mild upper respiratory infection is not a reason to defer immunization. (2)

Allergy to any component of PNEUMO 23®, its container or an anaphylactic or other allergic reaction to a previous dose of PNEUMO 23® are contraindications to vaccination. (See components listed in PHARMACEUTICAL INFORMATION, Composition and AVAILABILITY OF DOSAGE FORMS.)

WARNINGS

PNEUMO 23® [Pneumococcal Polysaccharide Vaccine] will not immunize against types of pneumococci other than those contained in the vaccine.

In patients receiving antibiotic prophylaxis against pneumococcal infection, such prophylaxis should not be discontinued after immunization with PNEUMO 23®.

Intramuscular injections should be given with care in persons suffering from coagulation disorders or on anticoagulant therapy because of the risk of hemorrhage. (2)

PNEUMO 23® should not be administered into the buttocks due to the varying amount of fatty tissue in this region, nor by the intradermal route, since these methods of administration may induce a weaker immune response.

Where possible, the vaccine should be given at least 10 to 14 days before splenectomy or initiation of chemotherapy or immunosuppressive therapy or early in the course of HIV infection. (5)

Immunocompromised persons (whether from disease or treatment) may not obtain the expected immune response. (2) If possible, consideration should be given to delaying vaccination until after the completion of any immunosuppressive treatment. (2) If PNEUMO 23® is given less than 14 days prior to splenectomy or initiation of chemotherapy, it may not elicit the expected immune response.

As with any vaccine, immunization with PNEUMO 23® may not protect 100% of susceptible individuals.

PRECAUTIONS

The possibility of allergic reactions in persons sensitive to components of the vaccine should be evaluated. Epinephrine Hydrochloride Solution (1:1,000) and other appropriate agents should be available for immediate use in case an anaphylactic or acute hypersensitivity reaction occurs. Health-care providers should be familiar with current recommendations for the initial management of anaphylaxis in non-hospital settings, including proper airway management. (2) (13)

For instructions on recognition and treatment of anaphylactic reactions, see the current edition of the Canadian Immunization Guide or visit the Health Canada website.

Before administration, take all appropriate precautions to prevent adverse reactions. This includes a review of the patient's history concerning possible hypersensitivity to the vaccine or similar vaccine, previous immunization history, the presence of any contraindications to immunization and current health status.

Before administration of PNEUMO 23® [Pneumococcal Polysaccharide Vaccine], health-care providers should inform the patient, parent or guardian of the benefits and risks of immunization, inquire about the recent health status of the patient and comply with any local requirements regarding information to be provided to the patient before immunization.

It is extremely important that the patient, parent or guardian be questioned concerning any symptoms and/or signs of an adverse reaction after a previous dose of vaccine. (See CONTRAINDICATIONS and ADVERSE REACTIONS.)

Do not inject into a blood vessel.

Use a separate sterile needle and syringe, or a sterile disposable unit, for each individual dose to prevent disease transmission.

PNEUMO 23® is not recommended for children <2 years of age.

Pregnancy and Lactation

Animal reproductive studies have not been conducted with PNEUMO 23®. Clinical trials using PNEUMO 23® have been conducted in pregnant women during the third trimester and no significant adverse events were recorded. (10) (11) (See CLINICAL PHARMACOLOGY.) According to the Canadian Immunization Guide, neither pregnancy nor breast-feeding is a contraindication to either the polysaccharide or the conjugate pneumococcal vaccine. (2) The benefits versus the risks of administering PNEUMO 23® in pregnancy should carefully be evaluated.

Breast feeding is not a contra-indication to pneumococcal polysaccharide vaccines. (2) (14)

Drug Interactions

PNEUMO 23® should not be mixed in the same syringe with other parenterals. If any other vaccines are administered during the same visit, they must be given at separate sites and with separate syringes.

PNEUMO 23® may be given simultaneously with influenza, meningococcal and Hib conjugate vaccines at separate sites with separate syringes. (2)

According to the Canadian Immunization Guide, there are obvious practical advantages to giving more than one vaccine at the same time, especially in preparation for foreign travel or when there is doubt that the patient will return for further doses of vaccine. Most of the commonly used antigens can safely be given simultaneously. No increase in the frequency or severity of clinically

significant side effects has been observed. The immune response to each antigen is generally adequate and comparable to that found in patients receiving these vaccines at separate times. (2)

ADVERSE REACTIONS

Local reactions at the injection site including pain, erythema, and induration occur in approximately 60% of vaccinees. These reactions are generally mild and transient.

Very rarely Arthus-like reactions have been reported. They resolve without after-effects and mainly occur in persons with high initial pneumococcal antibody levels.

Systemic Reactions

Fever ≥38.5°C occurs in approximately 2% of vaccinees. Febrile episodes generally occur soon after vaccination and resolve within 24 hours. Headache and/or general malaise occur in <8%.

In post-marketing surveillance, other general reactions such as lymphadenopathy, rash, urticaria, arthralgia, anaphylactoid reactions, myalgia, asthenia and fatigue have very rarely been reported. Injection site cellulitis and peripheral edema in the injected extremity have also been reported.

Very rarely, more severe systemic reactions have been reported in the literature following administration of pneumococcal polysaccharide vaccines. These include thrombocytopenia, (15) (16) vasculitis, (17) generalized rash, (18) and relapse of known underlying immune conditions. (19) The relationship, if any, between these reactions and pneumococcal vaccine is unknown.

Physicians, nurses, and pharmacists should report any adverse occurrences temporally related to the administration of the product in accordance with local requirements and to the Global Pharmacovigilance Department, Sanofi Pasteur Limited, 1755 Steeles Avenue West, Toronto, ON, M2R 3T4, Canada. 1-888-621-1146 (phone) or 416-667-2435 (fax).

DOSAGE AND ADMINISTRATION

The immunizing dose is a single injection of 0.5 mL given intramuscularly or subcutaneously.

When PNEUMO 23® [Pneumococcal Polysaccharide Vaccine] is administered to broaden serotype coverage following a series of pneumococcal conjugate (PCV7) vaccinations, PNEUMO 23® should be given no earlier than 8 weeks after the last dose of pneumococcal conjugate (PCV7) vaccine. (3) (7)

Revaccination: one injection of 0.5 mL

According to NACI, people for whom re-vaccination with pneumococcal polysaccharide vaccine should be considered include those with functional or anatomic asplenia or sickle cell disease; hepatic cirrhosis; chronic renal failure or nephrotic syndrome; HIV infection; and immunosupression related to disease or therapy. A single revaccination is recommended after 5 years in those aged who received their first pneumococcal vaccine at age >10 years and after 3 years in those aged who received their 1st pneumococcal vaccination at age ≤10 years. (2)

Immunization Schedule in Conjunction with the Pneumococcal Conjugate Vaccine

Children who have completed the pneumococcal conjugate vaccination series (PCV7) before they are 2 years of age, and who are among the risk groups for which PNEUMO 23® is already recommended (see INDICATIONS), should receive one dose of PNEUMO 23® at 2 years of age (>8 weeks after the last dose of pneumococcal conjugate vaccine). (7)

Inspect for extraneous particulate matter and/or discolouration before use. If these conditions exist, the product should not be administered.

For information on vaccine administration see the current edition of the Canadian Immunization Guide or visit the Health Canada website.

Before injection, the skin over the site to be injected should be cleansed with a suitable germicide.

SHAKE THE PREFILLED SYRINGE WELL to uniformly distribute the suspension.

Administer the vaccine **intramuscularly or subcutaneously**. The preferred site is the deltoid area. (2)

Do not inject intravenously.

Needles should not be recapped and should be disposed of properly.

Give the patient a permanent personal immunization record. In addition, it is essential that the physician or nurse record the immunization history in the permanent medical record of each patient. This permanent office record should contain the name of the vaccine, date given, dose, manufacturer and lot number.

PHARMACEUTICAL INFORMATION

Composition

PNEUMO 23® [Pneumococcal Polysaccharide Vaccine] is a clear, colourless liquid prepared from purified pneumococcal capsular antigens.

Each dose (0.5 mL) contains:

Purified *Streptococcus pneumoniae* polysaccharides, 25 µg of each of the following serotypes: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, 33F

phenol (as a preservative)	≤1.25 mg
isotonic buffered solution	up to 0.5 mL

Composition of the isotonic buffered solution:

sodium chloride	4.150 mg
disodium phosphate	0.065 mg
monosodium phosphate	0.023 mg
water for injection	q.s. 0.5 mL

STABILITY AND STORAGE

Store at 2° to 8°C (35° to 46°F). DO NOT FREEZE. Discard product if exposed to freezing.

Do not use vaccine after expiration date.

AVAILABILITY OF DOSAGE FORMS

Prefilled syringe	1 x 0.5 mL (single dose)
Prefilled syringes	10 x 0.5 mL (single dose)
Prefilled syringes	20 x 0.5 mL (single dose)

The plunger, stopper and needle shields of the syringe for this product do not contain dry natural latex rubber.

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Vaccine Information Service: 1-888-621-1146 or 416-667-2779. Business hours: 8 a.m. to 5 p.m. Eastern Time Monday to Friday.

Visit us at www.sanofipasteur.ca

Product Information as of April 2008

Manufactured by:

Sanofi Pasteur SA

Lyon, France

Distributed by:

Sanofi Pasteur Limited

Toronto, Ontario, Canada