

## **VARILRIX® PRODUCT INFORMATION**

### **Varicella Vaccine, live attenuated**

#### **NAME OF THE MEDICINE**

VARILRIX is a live virus vaccine for immunisation against varicella.

#### **DESCRIPTION**

VARILRIX is a lyophilised preparation of the live attenuated Oka strain of varicella-zoster virus, obtained by propagation of the virus in MRC<sub>5</sub> human diploid cell culture.

Each 0.5ml dose of the reconstituted vaccine contains not less than 10<sup>3.3</sup> plaque-forming units (PFU) of the varicella-zoster virus. The vaccine also contains amino acids, human albumin, lactose, mannitol and sorbitol. VARILRIX does not contain a preservative. Neomycin sulphate is present as a residual from the manufacturing process.

The manufacture of this product includes exposure to bovine derived materials. No evidence exists that any case of vCJD (considered to be the human form of bovine spongiform encephalopathy) has resulted from the administration of any vaccine product.

VARILRIX meets the World Health Organisation requirements for biological substances and for varicella vaccines.

#### **PHARMACOLOGY**

VARILRIX produces an attenuated clinically inapparent varicella infection in susceptible subjects, with the subsequent production of varicella-specific antibodies

#### **CLINICAL TRIALS**

##### **Efficacy studies**

The efficacy of GlaxoSmithKline (GSK)'s Oka/RIT varicella vaccines in preventing confirmed varicella disease (varicella cases were confirmed by, polymerase chain reaction {PCR} or exposure to a varicella case) has been evaluated in a large active controlled clinical trial in which children aged 12-22 months received one dose of VARILRIX (N = 2263) or two doses of *PRIORIX-TETRA* (N = 2279). The co-primary objective of this trial with respect to VARILRIX was to demonstrate vaccine efficacy of ≥60% in comparison to Priorix. The efficacy of VARILRIX (one dose) versus Priorix in respect of preventing confirmed varicella cases was 65.4% (97.5% CI: 57.2-72.1%), the lower limit of the 2-sided 97.5% CI however did not exceed the pre-defined criterion of 60%. The observed vaccine efficacy against confirmed varicella of any severity and against moderate or severe confirmed varicella after one dose of VARILRIX

and after 2 doses of *PRIORIX-TETRA* (mean follow-up period 35 months) are presented in Table 1.

**Table 1: Efficacy results after one dose of VARILRIX compared to 2 doses of PRIORIX TETRA**

| <b>Group</b>   | <b>N</b> | <b>n</b> | <b>Vaccine Efficacy<br/>97.5%CI</b> |
|--|----------|----------|-------------------------------------|
| <b>Efficacy against confirmed Varicella of any Severity</b>    |          |          |                                     |
| <b>VARILRIX</b>  | 2263     | 243      | 65.4%<br>57.2 – 72.1                |
| <b>PRIORIX-TETRA</b>   | 2279     | 37       | 94.9%<br>92.4 – 96.6                |
| <b>Efficacy against confirmed Moderate or Severe Varicella</b> |          |          |                                     |
| <b>VARILRIX</b>  | 2263     | 37       | 90.7%<br>85.9 – 93.9                |
| <b>PRIORIX-TETRA</b>   | 2279     | 2        | 99.5%<br>97.5 – 99.9                |

N= Number of subjects included in each group

n = Number of subjects reporting at least one event(s) in each group

In another randomised placebo-controlled trial conducted in children (n=327) 12 - 30 months of age one dose of VARILRIX vaccine was administered and followed up for an average of 29.3 months. The protective efficacy against common clinical cases of varicella was 100% and against clinical varicella of any severity was calculated as 88% (95% CI 72-96). The median number of vesicles in breakthrough cases in children was 2 (placebo group median = 30).

In a randomised placebo-controlled trial conducted in adults (n=233) two doses of VARILRIX vaccine were administered at an interval of 2 months and then followed up for an average of 18 months. Efficacy against clinical varicella of any severity was conservatively estimated at 75.9% (95% CI 43.8-89.7); errors in the methodology used in this trial imply that efficacy cannot be accurately determined. Of the 11 vaccinees with breakthrough disease, only 2 had >200 vesicles, compared with 57% of the unvaccinated subjects.

In both trials, subjects who responded to vaccination and who later developed breakthrough varicella had fewer lesions than unvaccinated individuals, demonstrating attenuation of varicella infection for those subjects who were not protected completely.

In a 3 year follow-up study, lower incidences of varicella breakthrough cases were reported in the group receiving two-doses of *PRIORIX-TETRA* (1 case, 0.44%) than in the group receiving only one dose of *VARILRIX* (4 cases, 5.06%), however the number of breakthrough cases were too small to make any conclusion about comparative vaccine efficacy. No cases of measles, mumps or rubella breakthrough disease were reported in any group during this 3 years follow-up.

### **Effectiveness studies**

Effectiveness data suggest a higher level of protection and a decrease in breakthrough varicella following two doses of vaccine than following one dose.

The effectiveness of one dose of *VARILRIX* was estimated in different settings (outbreaks, case-control and database studies) and ranged from 20%-92% against any varicella disease and from 86%-100% against moderate or severe disease.

The impact of one dose of *VARILRIX* in reducing varicella hospitalizations and ambulatory visits among children in a study performed in Uruguay were respectively 81% and 87% overall.

### **Immunogenicity Studies**

#### *One-dose regimen in children*

In subjects aged 9 months to 36 months (n=1573), the overall seroconversion rate following administration of *VARILRIX* was greater than 98.0% when measured 6 weeks post vaccination. Seroconversion was defined as postvaccination titres  $\geq 4 \text{ dil}^{-1}$  in a subject with prevaccination titres  $< 4 \text{ dil}^{-1}$ , and was determined using a commercial indirect immunofluorescence assay (IFA).

#### *Two-dose regimen in children*

In children aged 9 months to 6 years who received two doses of *VARILRIX* the seroconversion rate, when measured by IFA 6 weeks after vaccination, was 100% after a second vaccine dose. A marked increase of antibody titres was observed following the administration of a second dose (5 to 26-fold GMT increase).

In children aged 11 months to 21 months who received two doses of *VARILRIX*, the seroconversion rate, when measured by ELISA (seroconversion was defined as post-vaccination titres  $> 50 \text{ mIU/ml}$ ) 6 weeks after vaccination, was 89.6% after one vaccine dose and 100% after the second vaccine dose.

The following table 2 presents the range of results seen in 13 clinical trials evaluating the immunogenicity of VARILRIX in infants, adolescents and adults measured by IFA. GMTs are variable across studies, a recognised characteristic of live viral vaccines.

**Table 2: Immunogenicity of VARILRIX measured by IFA**

| <b>AGE RANGE</b> | <b>N</b> | <b>Seroconversion rate<br/>%</b> | <b>GMT</b> |
|------------------|----------|----------------------------------|------------|
| 9-36 mths        |          |                                  |            |
| - Dose 1         | 1467     | 92.9 - 100                       | 31 - 104   |
| -                |          |                                  |            |
| ≥ 12 years       |          |                                  |            |
| - Dose 1         | 350      | 82.3 - 94.1                      | 20 - 40    |
| - Dose 2         | 271      | 100                              | 167 - 236  |

The seroconversion rate in children aged 12-22 months in the large efficacy trial as measured by ELISA (50 mIU/ml) 6 weeks after one dose of VARILRIX and 6 weeks after two doses of Oka/RIT containing vaccines were 79.2% and 99.6%, respectively.

An increase in the antibody levels of vaccinees who remained seropositive was seen in studies which assessed persistence of antibody response. This suggests boosting due to exposure to varicella virus in the community. The antibodies have been shown to persist for at least 3 years after vaccination.

Three years after vaccination with two doses of *PRIORIX-TETRA*, 98.5%, 97.4%, 100% and 99.4% of all vaccinees were still seropositive for respectively anti-measles, anti-mumps, anti-rubella and anti-varicella antibodies.

There is no clinical data available with regards to the persistence and effectiveness of two doses of VARILRIX.

## **INDICATIONS**

VARILRIX is indicated for active immunisation against varicella of healthy children and adults from 9 months of age.

Groups who would particularly benefit from vaccination include:

- Non-immune adults, especially those in at-risk occupations such as health care workers, teachers and workers in children's day-care centres

- Non-immune parents of young children
- Non-immune household contacts, both adults and children, of immunocompromised patients with no history of the disease

## **CONTRAINDICATIONS**

VARILRIX is contraindicated in children and adults with known hypersensitivity to neomycin or to any other component of the vaccine. A history of contact dermatitis to neomycin is not a contraindication.

VARILRIX is contraindicated in children and adults having shown signs of hypersensitivity after previous administration of varicella vaccine.

VARILRIX is contraindicated in pregnant women. Pregnancy should be avoided for one month after vaccination (see USE IN PREGNANCY).

VARILRIX is contraindicated in patients with severe humoral or cellular immunodeficiency such as:

- patients with primary and acquired immunodeficiency states with a total lymphocyte count less than 1,200 per mm<sup>3</sup>.
- patients presenting other evidence of lack of cellular immune competence (e.g. children and adults with leukaemias, lymphomas, blood dyscrasias, clinically manifest HIV infection).
- patients receiving immunosuppressive therapy including high doses of corticosteroids (further guidance is found in the Australian Immunisation Handbook).

See PRECAUTIONS.

As with other vaccines, the administration of VARILRIX should be postponed in children and adults suffering from acute severe febrile illness. In healthy children and adults, the presence of a minor infection, however, is not a contraindication to immunisation.

## **PRECAUTIONS**

**VARILRIX must not be administered intravascularly or intradermally.**

Syncope (fainting) can occur following, or even before, any vaccination as a psychogenic response to the needle injection. It is important that procedures are in place to avoid injury from faints.

As with all injectable vaccines, appropriate medical treatment and supervision should always be readily available in case of rare anaphylactic reactions following the administration of a vaccine.

Alcohol and other disinfecting agents must be allowed to evaporate from the skin before injection of the vaccine since they can inactivate the attenuated viruses in the vaccine.

Transmission of the Oka vaccine virus has been shown to occur at a very low rate in seronegative contacts of vaccinees with rash. Transmission of the Oka vaccine from a vaccinee who does not develop a rash to seronegative contacts cannot be excluded.

The mild nature of the rash which developed in the healthy contacts indicates that the virus remains attenuated after passage through human hosts. Vaccine recipients should attempt to avoid contact with susceptible high risk individuals for up to 6 weeks, where possible.

As for any vaccine, vaccination with VARILRIX may not result in protection from subsequent infection with varicella virus in 100% of susceptible persons given the vaccine (see CLINICAL TRIALS).

As for other varicella vaccines, cases of varicella disease have been shown to occur in persons who have previously received VARILRIX. These breakthrough cases are usually mild, with a fewer number of lesions and less fever as compared to cases in unvaccinated individuals.

The duration of protection from varicella infection with VARILRIX is unknown. The need for and timing of booster doses is uncertain at present. In a highly vaccinated population, immunity of some individuals may wane due to lack of exposure to natural varicella as a result of shifting epidemiology.

It is not known whether VARILRIX given immediately after exposure to wild varicella virus will prevent illness. Results of a small household contact study using another live varicella virus vaccine containing the same varicella strain as VARILRIX suggested that some protection was provided by that vaccine when vaccination occurred within 72 hours of exposure.

There are inadequate data to assess the incidence and severity of herpes zoster (shingles) after vaccination with VARILRIX.

There is limited data on the use of VARILRIX in immunocompromised patients, therefore vaccination should be considered with caution and only when, in the opinion of the physician,

the benefits outweigh the risks, further guidance is found in the Australian Immunisation Handbook.

Immunocompromised patients who have no contraindication for this vaccination (see Contraindications) may not respond as well as immunocompetent children and adults, therefore some of these patients may acquire varicella despite appropriate vaccine administration. Immunocompromised patients should be monitored carefully for signs of varicella.

Very few reports exist on disseminated varicella with internal organ involvement following vaccination with the Oka varicella vaccine strain and these are mainly in immunocompromised patients.

### **Effects on Fertility**

No data available.

### **Use in Pregnancy**

Pregnant women must not be vaccinated with VARILRIX. Pregnancy should be avoided for one month after vaccination. Women who intend to become pregnant should be advised to delay pregnancy.

Adequate human data on the use of VARILRIX during pregnancy are not available and animal studies on reproductive toxicity have not been conducted.

### **Use in Lactation**

The effect on breast fed infants of the administration of VARILRIX to their mothers has not been evaluated in clinical studies.

## **INTERACTIONS WITH OTHER MEDICINES**

VARILRIX should not be mixed in the same syringe with other vaccines. Different injection sites should always be used.

There was no reduction in safety and immunogenicity when VARILRIX was given concomitantly, at a separate site, using a separate syringe, with a Measles-Mumps-Rubella vaccine and with a Diphtheria-Tetanus-Acellular pertussis vaccine. There are no data on concomitant administration with other live or inactivated vaccines or on administration of vaccines after VARILRIX has been given. If it is necessary to administer more than 1 live virus vaccine at the same time, these may be given at the same visit at different sites. If not given

on the same day, the live viral vaccinations should be separated by an interval of at least 4 weeks.

If tuberculin testing has to be done it should be carried out before or simultaneously with vaccination since it has been reported that live viral vaccines may cause a temporary depression of tuberculin skin sensitivity. As this anergy may last up to a maximum of 6 weeks, tuberculin testing should not be performed within that period after vaccination to avoid false negative results.

VARILRIX may be administered at the same time as a measles-containing vaccine. If this is not possible, an interval of at least one month should elapse before the measles-containing vaccine is given. Measles vaccination may lead to short lived suppression of the cell mediated immune response.

In children and adults who have received immune globulin or a blood transfusion, immunisation should be delayed for at least three months because of the likelihood of vaccine failure due to passively acquired varicella antibodies.

Salicylates should be avoided for 6 weeks after varicella vaccination as Reye's syndrome has been reported following the use of salicylates during natural varicella infection.

## **ADVERSE EFFECTS**

### Clinical Trial Data

More than 5500 subjects aged 9 months and over have been vaccinated with VARILRIX in ongoing and completed trials. Pain at the injection site was usually described as mild, and swelling and redness >2cm in diameter were infrequently observed.

No serious adverse events were considered to be unequivocally related to vaccination.

In the four week follow-up of a double-blind, placebo-controlled efficacy study in children aged 12-30 months (n=513), there was no significant difference in the nature or incidence of symptoms in subjects who received the vaccine compared to placebo.

In the adolescent/adult studies there was no increase in reactogenicity following the second dose. The incidence of symptoms after vaccination of seropositive individuals was not different from that of seronegative subjects.

**Table 3: Percentage of Vaccinees reporting solicited symptoms with respect to placebo recipients**

|   | Children              |                      | Adolescents           |                      | Adults                |                     |
|---|-----------------------|----------------------|-----------------------|----------------------|-----------------------|---------------------|
|   | Varilrix<br>(N = 340) | placebo<br>(N = 172) | Varilrix<br>(N = 333) | placebo<br>(N = 112) | Varilrix<br>(N = 108) | placebo<br>(N = 58) |
| <b>Local reactions</b>                                    | 8.2%                  | 7.6%                 | 2.4%                  | 0%                   | 25.9%                 | 13.8%               |
| <b>Fever*<br/>(temperature ≥ 38°C)<br/>(&gt; 39.5°C)</b>  | 51.8%<br>(5.9%)       | 51.2%<br>(5.2%)      | 1.8%<br>(0%)          | 2.7%<br>(0%)         | 26.9%<br>(0%)         | 24.1%<br>(0%)       |
| <b>Rash (any)<br/>(varicella-like<br/>vesicular rash)</b> | 37.4%<br>(6.2%)       | 36.6%<br>(5.2%)      | 0.6%<br>(0.3%)        | 1.8%<br>(0%)         | 6.7%<br>(1.0%)        | 7.9%<br>(1.6%)      |

Total post-vaccination period for evaluation of adverse events: 42 days for children (28 days for local reactions and fever), 98 days for adolescents and 126 days for adults.

\*Not solicited in all trials.

AE reporting rate was highly variable, depending on study methodology

In non-placebo controlled trials, the incidence of local and general adverse events varied widely, which may in part reflect the differing methodologies used for collection of the safety data.

The adverse events listed below are by body system and are categorised by frequency according to the following definitions: very common events reported at a frequency of greater or equal to 1/10 patients; common events are reported at a frequency of less than 1/10 but greater or equal to 1/100 patients; uncommon events reported at a frequency of less than 1/100 but greater or equal to 1/1000; rare events reported at a frequency of less than 1/1000 but greater or equal to 1/10000; very rare events reported at a frequency of less than 1/10000 patients. Causality has not necessarily been established.

### **Events reported in children**

**Local reactions:** *Very common:* Pain at the injection site; redness, swelling; *Common:* swelling (>2cm), redness (>2cm), injection site reaction; *Uncommon:* contact dermatitis

A trend for higher incidence of pain, redness and swelling after the second dose was observed as compared to the first dose.

**Body as a whole:** *Common:* Fever, rash, injury, viral infection; *Uncommon:* Varicella-like rash, fever >39°C, fatigue, pain, infection, bacterial infection, fungal infection; *Uncommon:* malaise

**Blood and lymphatic system disorders:** *Uncommon:* lymphadenopathy

**Skin and appendages:** *Common:* Pruritis, *Uncommon:* Eczema, purpura, sweat gland disorder, dry skin; *Rare:* urticaria

**Gastrointestinal:** *Common:* Diarrhoea, abdominal pain, vomiting, toothache; *Uncommon:* Nausea, dyspepsia

**Musculo-skeletal:** *Uncommon:* Arthralgia, myalgia

**Central Nervous System:** *Common:* Headache, nervousness; *Uncommon:* somnolence, irritability

**Respiratory:** *Common:* URTI, coughing, pharyngitis, rhinitis; *Uncommon:* asthma, sinusitis, respiratory disorder

**Special Senses:** *Common:* conjunctivitis, otitis media; *Uncommon:* earache

**Events reported in adults (after dose 1 and/or dose 2)**

**Local reactions:** *Very common:* Pain at the injection site, injection site reaction, redness, injection site inflammation; *Common:* injection site mass

**Body as a whole:** *Very Common:* Fever; *Common:* fatigue, chest pain, injury, malaise; infection viral; swelling at the injection site; *Uncommon:* Varicella-like rash

**Skin and appendages:** *Common:* Dermatitis, pruritis, rash; *Rare:* urticaria

**Gastrointestinal:** *Common:* Diarrhoea, abdominal pain, vomiting, nausea, gastroenteritis

**Central Nervous System:** *Very common:* headache; *Common:* dizziness, migraine, somnolence; *Uncommon:* irritability

**Respiratory:** *Very common:* URTI, pharyngitis; *Common:* asthma, bronchitis, coughing, sinusitis, rhinitis, sputum increased

**Haematologic/lymphatic:** *Common:* Lymphadenopathy, lymphadenopathy cervical

**Musculo-skeletal:** *Common:* Arthralgia, back pain, myalgia

**Special Senses:** *Rare:* conjunctivitis

### Post-marketing Data

More than 15 million doses of VARILRIX have been distributed since first approval in October 1994.

During post-marketing surveillance, the following additional reactions have been reported after varicella vaccination:

Varicella-like rashes occurring >2 weeks after vaccination have been reported *very rarely*. The median number of vesicles reported was 50, and fever was reported as present in approximately one-third of all cases of breakthrough disease.

#### **Infections and infestations:**

Very Rare: varicella

Rare: herpes zoster

#### **Blood and lymphatic system disorders:**

Rare: thrombocytopenia

#### **Immune system disorders:**

Rare: hypersensitivity, anaphylactic reactions

#### **Nervous system disorders:**

Rare: encephalitis, cerebrovascular accident, cerebellitis, cerebellitis like symptoms (including transient gait disturbance and transient ataxia), convulsions

#### **Vascular disorders:**

Rare: vasculitis (including Henoch Schonlein purpura and Kawasaki syndrome)

#### **Skin and subcutaneous tissue disorders:**

Rare: erythema multiforme

The following additional side effects have been reported regardless of causality since the vaccine has been marketed:

**Skin:** Stevens-Johnson syndrome

### **DOSAGE AND ADMINISTRATION**

VARILRIX should be administered as a single dose by subcutaneous injection only. The upper arm (deltoid region) is the preferred site of injection.

UNDER NO CIRCUMSTANCES SHOULD VARILRIX BE ADMINISTERED INTRAVENOUSLY.

VARILRIX should not be administered intradermally.

## **Dosage**

### Infants and Children (aged 9 months up to and including 12 years of age)

Children from the age of 9 months up to 12 years of age, two doses of VARILRIX administered at least 6 weeks apart is recommended for the benefit of enhanced immune response against varicella virus.

### Adolescents and Adults (13 years of age and over)

Two 0.5ml doses of reconstituted VARILRIX, administered at least 6 weeks apart, are required.

## **Interchangeability**

- A single dose of VARILRIX may be administered to those who have already received a single dose of another varicella-containing vaccine.
- A single dose of VARILRIX may be administered followed by a single dose of another varicella-containing vaccine.

## **Administration**

VARILRIX should be reconstituted by adding 0.5 mL of sterile water diluent to the vaccine vial containing the powder. After the addition of the diluent to the powder, the mixture should be well shaken until the powder is completely dissolved in the diluent.

Due to minor variations of its pH, the colour of the reconstituted vaccine may vary from a clear peach to a pink coloured solution. Vaccines should be inspected visually for any foreign particulate matter and/or variation of physical aspect prior to administration. In the event of either being observed, discard the vaccine.

After reconstitution, it is recommended that the vaccine be injected as soon as possible. However, it has been demonstrated that the vaccine may be kept for up to 90 minutes at room temperature (25°C) or up to 8 hours in the refrigerator (2°C to 8°C). If not used within these timeframes, the reconstituted vaccine must be discarded. For use in a single individual, on one occasion only. VARILRIX contains no antimicrobial agent. Use once only and discard any residue.

Alcohol and other disinfecting agents must be allowed to evaporate from the skin before the injection of the vaccine as they may inactivate the virus.

Further guidance regarding the use of vaccines is found in the Australian Immunisation Handbook.

### **OVERDOSAGE**

Cases of accidental administration of more than the recommended dose of VARILRIX have been reported. Amongst these cases, the following adverse events were reported: lethargy and convulsions. In the other cases reported as overdose there were no associated adverse events.

For information on the management of overdose, contact the Poison Information Centre on 131126 (Australia).

### **PRESENTATIONS AND STORAGE CONDITIONS**

VARILRIX is presented as a slightly cream to yellowish or pinkish coloured powder in a glass vial. The sterile diluent is clear and colourless and presented in ampoules and prefilled syringes.

VARILRIX is supplied as:

- a single dose vial of lyophilised vaccine with diluent syringe or ampoule included,
- a box containing 10 single dose vials of lyophilised vaccine with 10 diluent syringes included,
- a box containing 10 single dose vials of lyophilised vaccine, and
- sterile diluent in boxes of 10 ampoules is supplied separately.

The ampoules, vials and prefilled syringes are made of neutral glass type I, which conforms to European Pharmacopoeia Requirements.

Not all presentations and pack sizes may be marketed.

The lyophilised vaccine should be stored in a refrigerator between 2°C and 8°C. The diluent can be stored in the refrigerator or at ambient temperatures. The lyophilised vaccine is not affected by freezing.

The shelf life of VARILRIX is 24 months from the date of manufacture if stored between 2°C and 8°C.

When supplies of VARILRIX are distributed from a central cold store, it is necessary to arrange transport under refrigerated conditions.

**MANUFACTURER**

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**NAME AND ADDRESS OF THE SPONSOR**

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