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## 4.1 General Topics Related To Immunization Injection

### Pain Control

#### Distraction techniques

The routine use of distraction, relaxation, and other measures has been shown to reduce distress and pain following vaccination in young children. Reducing infant distress may enhance parents' timely attendance for subsequent vaccinations.

Distraction measures that may decrease discomfort following vaccination in young children include:

- swaddling and holding the infant securely (but not excessively),
- shaking a noisy toy (for infants and very young children),
- playing music,
- encouraging an older child to pretend to blow away the pain using a windmill toy or bubbles,
- a vaccine that is known to sting should be given last.

#### Topical Anaesthetics

Topical anaesthetics such as Emla® may be applied by some parents; these should be used only for the ages recommended and as per product instructions. The use of Emla patch is not recommended when performing PPD, Mantoux testing.

#### Analgesic Agents

Non-aspirin containing pain reliever may be used by the patient (parent/guardian) to decrease pain/fever post immunization, acetaminophen is usually recommended. These should be used according to product instructions.

### Routine Practices

#### Hand Hygiene

Routine practices are always recommended when administering vaccine. The single, most effective disease prevention activity is hand washing. Hands should be washed with soap and water or cleansed with an alcohol based hand rub (ABHR) between patients, before vaccine preparation or anytime if the hands are soiled.

#### Gloving

Gloves are not mandatory for vaccine administration unless there is potential for exposure to blood or body fluids or if the provider has an open lesion on the hands.

#### Needle Stick Injuries

Needle stick injuries should be reported as per regional policy. Safety engineered syringes are now being used in some Regional Health Authorities to help prevent needle stick injuries; this is a recommendation of their nursing practice committee.

#### Equipment Disposal

Used needles/syringes should not be detached or otherwise manipulated post immunization, but placed in a puncture proof container.

## Equipment

### Filtered Needles

Filtered needles are not recommended for the routine administration of biological products or epinephrine.

### Changing Needles

If the integrity or sharpness of the needle is in question it should be changed otherwise no reason to do so. To change the needle after drawing up may also be an advisory in the product monograph.

### Mass Immunization

When mass immunization programs are required, the product monograph should be reviewed in regards to the amount of time the vaccine can be left in the syringe. When the word “immediate” is used this means, the vaccine must be given as soon as possible once drawn into the syringe.

### Multiple injections

There are no contraindications to giving multiple vaccines at the same clinic visit. Separate limbs should be used if 2 injections are required. If more than 2 injections are required or if only one limb is available 2 injections may be administered into the same limb separated by at least 2.5 cm (1"). The province does not support deferral of vaccines to avoid multiple injections as this negates the policy for “on time” immunization and provides an opportunity for illness.

### Combination of Contents of Multi-Dose Vials

Combining the contents of one multi-dose vial with the contents of another is not recommended at any time

### Translation of materials

Translation of immunization materials are available from varied sites:

CDC <http://www.cdc.gov/vaccines/pubs/pinkbook/index.html>  
<http://www.schoolhealthservicesny.com/uploads/Immunization%20Translations.pdf>  
<http://www.immunize.ca/en/default.aspx>

### Standard Operating Procedure for Injections

Always check for the seven rights: Right product, client, dose, time, route, reason, and documentation.

Three medication checks: Check label and name of product:

- 1) when removing product from the refrigerator,
- 2) when drawing up the vaccine
- 3) just prior to administration

## 4.2 Procedure for Intramuscular Injection

Equipment	
Epinephrine and Benadryl 1, 3 & 5 cc disposable syringes Variety of needles including 22G-25G 7/8" to 1 1/2" needles Vaccine Vaccine storage cold pack Dry gauze sponges	Alcohol swabs Alcohol based hand rub (ABHR- 60-90 % alcohol content) Barrier fields Sharps container <i>Immunization Health Record</i> <i>Personal Record of Immunization</i> Information sheets for specific vaccines
Procedure	Rationale
1. Check immunization record for name, date of birth, address and telephone number.	Verifies identity of client and allows for updating of information.
2. Explain the risks and benefits of immunization, including minor and serious reactions that may occur.	Fulfils the requirement for <i>informed consent</i> . Provides an opportunity for discussion of appropriate treatment for any reactions.
3. Obtain and record the immunization history, and screen for the present procedure.	Provides the opportunity for reviewing medical history, including previous immunization history.
4. Verify or obtain dated consent.	
5. Arrange equipment on a barrier field, placed out of child's reach.	
6. Check anaphylaxis kit, noting appropriate doses for person to be immunized.	Noting the appropriate dose of adrenalin saves time if the dose is required.
7. Decontaminate hands with ABHR	Alcohol based hand rub is the preferred method of decontaminating hands. Wash hands with soap and water only if visibly soiled.
8. Check vaccine product label (3 checks) for expiry date, amount and appearance.	Vaccine that is outdated or that looks unusual in terms of colour, clarity or consistency may not be fully potent and should not be used. Vaccine without a clearly marked lot number should not be used.
9. Draw up vaccine as per specific product instructions.	

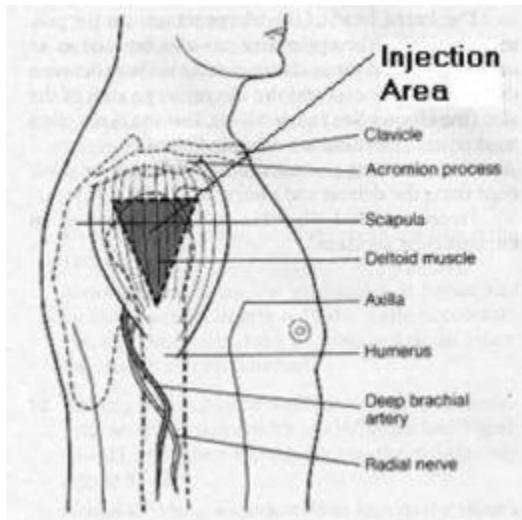
<p>10. Choose the site for injection. If this is not the first immunization, choose the limb opposite the site of the previous injection.</p> <p>In newborns, preterm infants and infants less than 12 months of age use the <b>vastus lateralis</b>.</p> <p>For toddlers and older children the <b>vastus lateralis</b> or <b>deltoid</b> muscle can be used.</p> <p>In adolescents and adults, the <b>deltoid</b> muscle is the preferred injection site.</p>	<p>Rotating the injection site minimizes the trauma to muscle.</p> <p>This muscle is large and well developed. It is accessible, free of major nerves and blood vessels and can readily adsorb vaccine.</p> <p>Deltoid muscle injection improves absorption of the vaccine; it is also adequate and readily available.</p>
<p>11. Assess the muscle mass for needle size and length.</p> <p>For an infant <b>less than 4 months</b> of age, a 25G 7/8" needle is suitable.</p> <p>For older infants, children 1" is recommended</p> <p>For adolescents and adults a 22-25G 1-1<sup>1/2</sup> " needle is recommended</p>	<p>Age, weight, and available muscle mass must be considered when choosing needle. If the amount and general condition of the muscle mass indicate, changes in gauge and length may be made.</p> <p>A 7/8" needle is appropriate for use in a child under the age of four months.</p> <p>A 1" needle is required for adequate muscle penetration in those 4 months of age and older.</p> <p>A 1-1 <sup>1/2</sup>" needle is required for adequate muscle penetration in adolescents or adults</p>
<p>12. Changing the needle is not mandatory but may be done if sharpness is compromised</p>	<p>A needle used to pierce a rubber stopper or ampoule may be used for subsequent injection, but if it has become blunt or bent should be replaced with a needle of the same size.</p>

13. Landmark the site for injection (see diagram at end of section 4.2).	<p><b>Vastus lateralis:</b> Palpate for the greater trochanter and the lateral border of the kneecap. Visualize a vertical line between these landmarks. The vastus lateralis muscle is located lateral to this line. Using the greater trochanter as the upper border and the lateral border of the kneecap as the lower, divide the thigh into thirds. The anterolateral aspect of the middle third is where the belly of the vastus lateralis muscle lies, and the injection site is in the middle of this area, as shown.</p> <p><b>Deltoid:</b> Have the person's elbow flexed and the forearm supported (possible stance - hand on hip) Locate the lower edge of the acromium process. Estimate a point opposite the axilla. Visualize an inverted triangle with the base at the acromium process and the apex just below the axilla. This defines the deltoid muscle. Locate a rectangular area in the middle of the muscle as follows:- upper edge: two to three finger widths below the acromium process. Lower edge: a point just above the axilla. Side edges: parallel to arm, slightly posterior to midline of outer arm. The injection site is in the middle of this area, as shown.</p>
14. For infant immunizations, have the child held securely with the site accessible. An older child may consent to standing alone or sitting next to the caregiver.	
15. Firmly spread skin with the thumb and index finger, grasping the muscle deeply on each side. Cleanse the site with antiseptic solution and allow area to air dry.	Compresses fat, stabilizes and isolates muscle. Obese clients may need the skin to be stretched tautly to displace subcutaneous tissue, in combination with grasping of the muscle.
16. Insert the needle at a 90 degree angle.	This angle ensures that vaccine is delivered deep into the belly of the muscle, promoting maximum absorption. Minimizes the chance of vaccine encountering subcutaneous tissue.
17. Release the isolated tissue when the needle is safely inserted.	Bunched tissue will be more painful to inject into.
18. Inject vaccine at a rapid rate, using a smooth continuous motion	A more rapid rate of injection decreases the pain of injection.

19. Withdraw needle and immediately dispose of the needle/syringe set in the sharps container. <b>Do not recap or remove the needle.</b>	Leaving needle out or recapping increases the risk of needle-stick injuries.
20. Cover site with clean gauze, massaging gently. Alternately, cover the site with a band aid if bleeding occurs. (This simultaneously with step 19)	Promotes absorption of vaccine. Application of pressure helps to seal the puncture site if bleeding occurs.
21. Praise child for being cooperative, allowing him or her to be comforted.	
22. Record procedure in CRMS, noting preparation name, date of immunization, lot number, site, route and dose, on the client's Immunization and Health Record	If using Client Referral Management System (CRMS) follow procedure in CRMS manual.
23. Date and sign the Personal Record of Immunization, noting the preparation given. Appointment time for the next immunization can be noted here as well.	Updates the personal record for future reference.
24. Dispose of vaccine containers in the sharps container.	
25. Provide caregiver with appropriate literature, a copy of the immunization record and advise caregiver that the Department of Health policy recommends that immunized persons remain in the clinic area for a 15 minute waiting period following the procedure.	Waiting period allows for an immediate response if an allergic or anaphylactic reaction occurs.

**Diagrams for injection sites**

<http://www.nelifecare.org/doc/instructions/IntramuscularInjection.pdf>

**Intramuscular vastus lateralis****Intramuscular deltoid****Diagram of deltoid intramuscular injection**

This diagram shows exactly where the anatomical marks are located to help visualize the deltoid intramuscular injection sites location

## 4.3 Procedure for Subcutaneous Injection

Equipment	
Epinephrine & Benadryl 1,3, & 5 cc disposable syringes 25 G 5/8" needles Vaccine Vaccine storage cold pack Dry gauze sponges	Alcohol swabs Alcohol based hand rub(ABHR- 60-90 % alcohol content) Barrier fields Sharps container <i>Immunization Health Record</i> <i>Personal Record of Immunization</i> Information sheets for specific vaccines
Procedure	Rationale
1. Check immunization record for name, date of birth, address and telephone number.	Verifies identity of client and allows for updating of information.
2. Explain the risks and benefits of immunization, including minor and serious reactions that may occur.	Fulfils the requirement for <i>informed consent</i> . Provides an opportunity for discussion of appropriate treatment for any reactions.
3. Obtain and record the immunization history, and screen for the present procedure.	Provides the opportunity for reviewing medical history, including previous immunization history.
4. Verify or obtain dated consent.	
5. Arrange equipment on a barrier field, placed out of child's reach.	
6. Check anaphylactic kit, noting appropriate doses for person to be immunized.	Noting the appropriate dose of adrenalin saves time if the dose is required.
7. Decontaminate hands with ABHR.	Alcohol based hand rub is the preferred method of decontaminating hands. Wash hands with soap and water only if visibly soiled.
8. Check vaccine product label (3 checks) for product name, expiry date, amount and appearance.	Vaccine that is outdated or that looks unusual in terms of colour, clarity or consistency may not be fully potent and should not be used. Vaccine without a clearly marked lot number should not be used.
9. Draw up vaccine as per specific product instructions.	Some vaccines (e.g. MMR) may need to be mixed prior to use.

10. Select a site for injection. If this is not the first Immunization, choose the limb opposite the site of the previous injection. Upper arm is suitable in most clients.	Rotating the injection site minimizes the trauma to site.
11. If drawing up from an ampoule change needle, selecting one of appropriate gauge and length.	Using the same needle to draw up vaccine from an ampoule and to inject could result in vaccine on outside of needle being tracked through subcutaneous tissue on injection. A needle used to pierce a rubber stopper may be used for subsequent injection but if it has become blunt or bent it should be replaced with a needle of the same size.
12. For infant immunizations, have the child held Securely with the site accessible. An older child may consent to standing alone or sitting next to the caregiver.	
13. Landmark the site (see diagrams at end of 4.3)	
14. Clean the site with an antiseptic, and allow area to air dry.	Cleanses the site for needle insertion, and prevents wet alcohol from being tracked into subcutaneous tissue.
15. Hold a fold of skin between the thumb and index finger, grasping the subcutaneous tissue.	Stabilizes the subcutaneous injection site. Obese clients may need the skin to be stretched tautly to isolate the subcutaneous tissue.
16. Insert the needle at a 45 degree angle.	This ensures that the vaccine enters the subcutaneous tissue, promoting maximum absorption of vaccine. Minimizes the chance of vaccine encountering muscle tissue.
17. Release the isolated tissue when the needle is safely inserted.	Bunched tissue will be more painful to inject into.
18. Inject vaccine at a moderate rate, using a Smooth continuous motion.	A slow and steady rate of injection allows for gradual flow of vaccine, minimizing pain.
19. Withdraw needle and immediately dispose of the needle/syringe set in the sharps container. Do not recap the needle.	Leaving needle out or recapping increases the risk of needle stick injuries.
20. Cover site with clean gauze, massaging gently. Alternately, cover the site with a band-aid if bleeding occurs.	Promotes absorption of vaccine. Application of pressure helps to seal the puncture site if bleeding occurs.

21. Praise child for being cooperative, allowing him or her to be comforted.	
22. Record procedure in CRMS, noting preparation name, dates of immunization, lot number, site, route and dose and on the clients Immunization and Health Record.	If using Client Referral Management System (CRMS) follow procedure in CRMS manual.
23. Date and sign the Personal Record of Immunization, noting the preparation given. Appointment time for the next immunization can be noted here as well.	Updates the personal record for future reference.
24. Dispose of vaccine containers in the sharps container.	
25. Provide caregiver with appropriate literature, copy of immunization record and advise caregiver that the Department of Health and Community Services policy recommends that immunized persons remain in the clinic area for a 15 minute waiting period following the procedure.	Waiting period allows for an immediate response if an allergic or anaphylactic reaction occurs.

**Area over the Deltoid or Upper Outer aspect of the Arm**

Have the person's elbow flexed and the forearm supported. Locate the lower edge of the acromium process. Estimate a point opposite the axilla. Visualize an inverted triangle with the base at the acromium process and the apex just below the axilla. This defines the deltoid muscle. The area over the deltoid or the upper outer aspect of the arm may be used for subcutaneous injection.

**Figure: A subcutaneous injection into the deltoid area of the upper arm using a 25 gauge, 5/8" needle, inserted at a 45° angle**



Photo courtesy Ann Kempe, MCRI, VIC, Immunization Manual of Australia

## 4.4 Procedure for Intradermal Injection

The only intradermal test used in Newfoundland and Labrador is Tuberculin Skin Testing (TST) which is not a speciality competency as it is no longer included in the ARNNL standards for practice.

Tuberculin skin tests can be given at the same time, or any time after most vaccines. However, live vaccines (e.g. MMR or varicella vaccine) may interfere with the tuberculin test response and produce a false negative response if the vaccine was given in the 4 weeks before the tuberculin test.

If possible, delay the tuberculin skin test until at least 4 weeks following date of vaccination with a live vaccine. If the test cannot be delayed, it is acceptable to do the test and discuss any negative results with the CDCN. The test may have to be repeated or a chest x-ray completed. Live vaccines will not interfere with the tuberculin test if given on the same day as the test.

This intradermal procedure is addressed in the NL Tuberculosis Management guideline which is found on the provincial website:

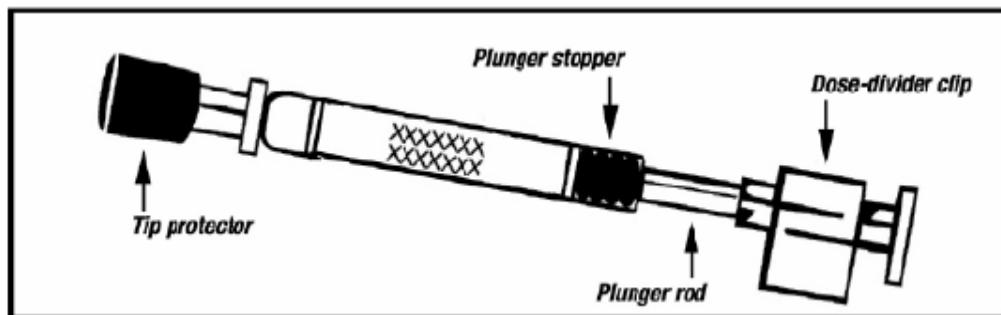
[http://www.health.gov.nl.ca/health/publichealth/cdc/tuberculosis\\_management.pdf](http://www.health.gov.nl.ca/health/publichealth/cdc/tuberculosis_management.pdf)

## 4.5 Procedure for Intranasal Vaccine

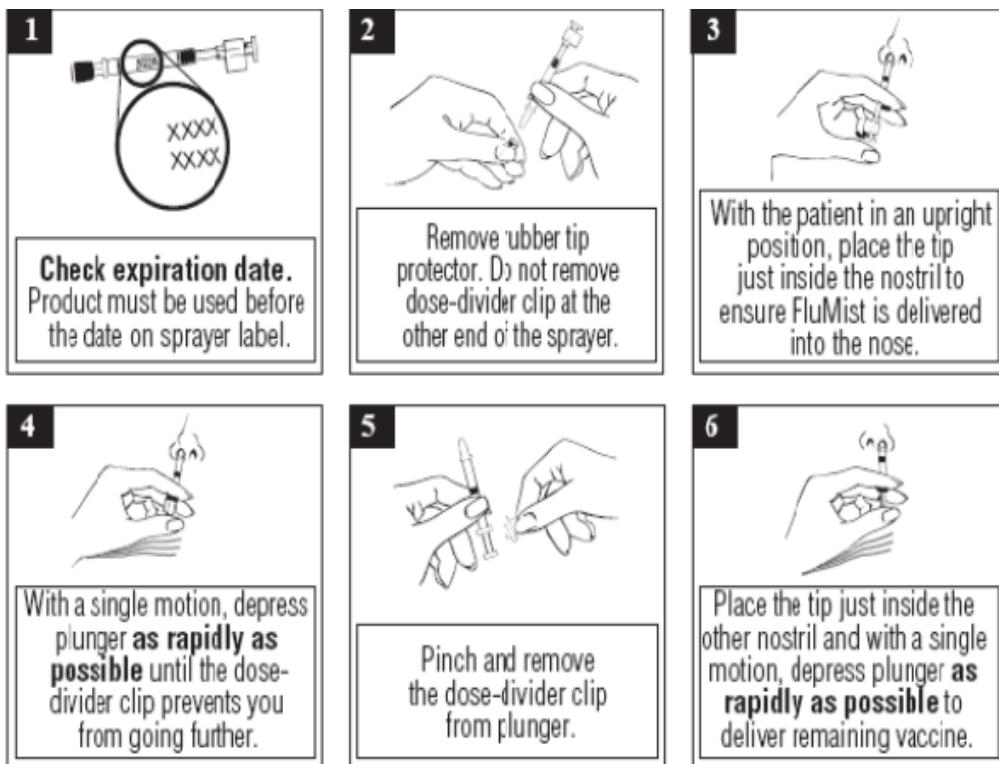
Equipment	
Epinephrine & Benadryl Vaccine Vaccine storage cold packs Tissues	Alcohol based hand rub(ABHR- 60-90 % alcohol content) Barrier fields Sharps container Immunization Health Record Personal Record of Immunization Information sheets for specific vaccines
Procedure	Rationale
1. Check immunization record for name, date of birth, address and telephone number.	Verifies identity of client and allows for updating of information.
2 Explain the risks and benefits of immunization, including minor and serious reactions that may occur.	Fulfils the requirement for <i>informed consent</i> . Provides an opportunity for discussion of appropriate treatment for any reactions.
3. Obtain and record the immunization history, and screen for the present procedure.	Provides the opportunity for reviewing medical history, including previous immunization history.
4. Verify or obtain signed consent.	
5. Check anaphylactic kit, noting appropriate doses for person to be immunized.	Noting the appropriate dose of epinephrine saves time if the dose is required.
6. Check vaccine product label (3 checks) for product name, expiry date, amount and appearance.	Vaccine that is outdated or that looks unusual in terms of colour, clarity or consistency may not be fully potent and should not be used. Vaccine without a clearly marked lot number should not be used.
7. Remove rubber tip protector. Do not remove dose – divider clip at the other end of sprayer.	Removing dose- divider clip may lead to full dose being administered into one nostril.
8. With client in an upright position, place tip just inside nostril to ensure vaccine is delivered into the nose	There is no need to tilt head. Active inhalation (sniffing) is not required.
9. With a single motion, depress plunger as rapidly as possible until the dose divider prevents you from going further	
10. Pinch and remove the dose-divider clip from the plunger and administer the remaining dose to second nostril	Two divided sprays are used to maximize the vaccines contact surface area of epithelial cells within the nasopharynx.

11. Record procedure, noting preparation name, date of immunization, lot number, site, route and dose and on the client's Immunization and Health Record. Document in CRMS where necessary	If using Client Referral Management System (CRMS) follow procedure in CRMS manual.
12. Date and sign the Personal Record of Immunization, noting the preparation given. Appointment time for the next immunization if required can be noted here as well.	Updates the personal record for future reference.
13. Dispose of vaccine containers in the sharps container.	The sprayer should be disposed of according to the standard procedures for medical waste.
14. Provide caregiver with appropriate literature, copy of immunization record and advise caregiver that the Department of Health and Community Services policy recommends that immunized persons remain in the clinic area for a 15 minute waiting period following the procedure.	Waiting period allows for an immediate response if an allergic or anaphylactic reaction occurs.

**Figure 1: Diagram of needle-free intranasal injector.**



**Figure 2: Diagram of administration steps for intranasal injector.**



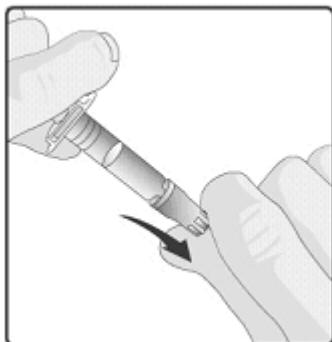
**DO NOT INJECT. DO NOT USE A NEEDLE.**

**Note:** Active inhalation (i.e., sniffing) is not required by the patient during FluMist administration

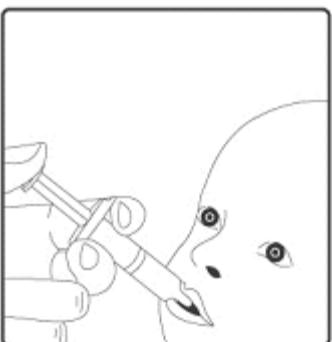
## 4.6 Procedure for Oral Vaccine

The only oral vaccine used in Newfoundland and Labrador is Rotarix (Rot) administered at two and four months to prevent rotavirus. For detailed information on Rotarix please see Section 3, Routine Immunization Products.

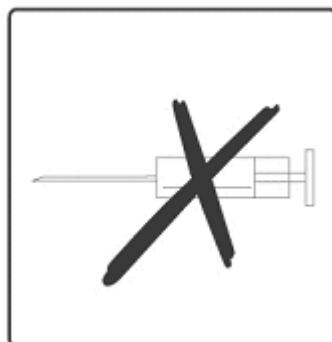
The Rotarix vaccine contains sucralose, which is known to decrease pain. It is therefore recommended that the oral vaccine be administered first, prior to DTaP-IPV-Hib and Pneu-C-13.



1. Remove the protective tip cap from the **oral** applicator.



2. This vaccine is for **oral administration only**. The child should be seated in a reclining position. Administer **orally** (i.e. into the child's mouth towards the inner cheek) the entire content of the **oral** applicator.



3. **Never inject this product**