VENOM IMMUNOTHERAPY - SCH

DRUG PROTOCOL©

DOCUMENT SUMMARY/KEY POINTS

- Venom Immunotherapy is recommended in children at risk of anaphylaxis from bee or wasp sting.
- Standard, Rush and Modified Rush protocols may be considered, patients undergoing rush protocols require hospitalisation for approximately 5 days.
- The Medical Officer must inform Pharmacy Technology Unit 1 week prior to admission to enable sufficient time for ordering and preparing the products.
- All doses must be prescribed on the national medication chart and administered by a nurse performing the necessary observations.

CHANGE SUMMARY

- Due for mandatory review.

READ ACKNOWLEDGEMENT

- Medical, Nursing and Pharmacy staff involved in the prescription, manufacturing and administration of Venom Immunotherapy at SCH should read and acknowledge this document.

Note: Separate Practice Guidelines may be required to cover all aspects of management.

Approved by:	SCHN Policy, Procedure and Guideline Committee	SCH Medicines Advisory Group
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Team Leader:	Staff Specialist	**Area/Dept**: SCH Immunology

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Introduction / Background

Venom Immunotherapy (VIT) is recommended for all children who experience sting induced anaphylaxis or systemic reactions not limited to cutaneous symptoms.[1,5,6] It reduces the risk of anaphylaxis from around 60% to 5% for these patients with a prolonged benefit observed 10-15 years after the cessation of treatment.[1,6] It is generally not indicated in children with only cutaneous systemic reactions or large local reactions but can be considered if special circumstances are present. [6]

The procedure involves administering incremental doses of venom according to standard protocols. The protocols may be modified for individual patients but the basic principle of incremental dosing remains constant. Standard, Rush and Modified Rush protocols are available and have been found to be safe and effective in children.[2, 5, 6]

Approved Indications

- Desensitisation of patients with bee or wasp sting allergic patients at risk of anaphylaxis from a sting.

Precautions

- Patient with poorly controlled asthma, acute infection
- Patients on venom immunotherapy are at risk of anaphylaxis following any dose of the protocol.
- This guideline should be read in conjunction with the SCHN Anaphylaxis and Generalised Allergic Reaction in ED and at Home Practice Guideline.
- Emergency medications including adrenaline, antihistamines and corticosteroids must be immediately available should they be required and prescribed on the medication chart as a precautionary measure:
    - **Adrenaline 1:1000 injection (1mg/mL)** (Dose: 10 microgram/kg = 0.01mL/kg IM to a maximum recommended dose of 0.5mL)
    - **Antihistamines**: Oral non-sedating antihistamine e.g. loratadine or cetirizine (dose varies according to medication please see formulary)
    - **Corticosteroids:** Hydrocortisone 100mg injection (Dose: 4mg/kg to a maximum of 200mg IV) OR oral prednisolone (Dose: 2mg/kg to a maximum of 50mg)

Presentation, Stability and Storage[3]

Prepared solutions have varying expiration depending on the reconstituting fluid used and product concentration. Expiration dates are listed in Table 1 and apply only to medications stored in the refrigerator between 2 and 8 degrees C.

Table 1: Recommended expiration dates following reconstitution with albumin- saline

Venom Concentration	Recommended Expiry Date
100microg/mL	6 months
10microg/mL	30 days
1microg/mL	30 days
0.1microg/mL	14 days
Less than 0.1microg/mL	Prepare fresh daily

A reconstituted vial containing 6mL of 100 microg/mL venom extract has a 6 month shelf life and is designed to be used in a multi dose fashion for individual patients. Where multidose vials are stored in the clinic they must ***only*** be used to multidose for the ***one individual patient*** over the 6 month period. No other patient should be dosed from this vial.

Protocols

Standard VIT protocol is shown below in Table 2[3]. The listed doses are given at weekly intervals by subcutaneous injection into the deltoid region or thigh.[3-6] This is usually done as an outpatient and does not require a hospital admission.

Table 2.

Dose Number	Concentration (microg/mL)	Volume (mL)	Dose Number	Concentration (microg/mL)	Volume (mL)	Dose Number	Concentration (microg/mL)	Volume (mL)
1	1	0.05	**5**	10	0.05	**9**	100	0.05
2	1	0.1	**6**	10	0.1	**10**	100	0.1
3	1	0.2	**7**	10	0.2	**11**	100	0.2
4	1	0.4	**8**	10	0.4	**12**	100	0.4
						13	100	0.6
						14	100	0.8
						15	100	1

Semi-Rush VIT Protocol is shown below in Table 3[7]. On days where multiple doses are required these are usually given in hourly intervals on each day as shown. This is usually done as an outpatient or on the Medical Day Unit.

Table 3.

Week	Day	Dose	Volume (mL)	Concentration (microg/mL)	Amount of venom (microg)
1	1	1	0.1	0.01	0.001
		2	0.1	0.1	0.01
		3	0.1	1	0.1
2	8	4	0.3	1	0.3
		5	0.1	10	1
		6	0.3	10	3
3	15	7	0.6	10	6
		8	0.1	100	10
		9	0.15	100	15
4	22	10	0.2	100	20
		11	0.25	100	25
5	29	12	0.3	100	30
		13	0.35	100	35
6	36	14	0.4	100	40
		15	0.45	100	45
7	43	16	0.5	100	50
		17	0.5	100	50
8	15	18	0.7	100	70
		19	0.3	100	30
9	57	20	1	100	100
11	71	21	1	100	100
14	92	22	1	100	100
Monthly thereafter			1	100	100

Ultra-Rush VIT protocol is shown below in Table 4[7]. Ultra-Rush VIT protocols are done as an inpatient or on the Medical Day Unit. Overnight observation as an inpatient may be required. The listed doses are given as shown or as specified by Medical Officers by subcutaneous injection into the deltoid or thigh region.

Table 4.

Day	Time	Strength (microg/mL)	Dose (mL)	Total amount (microg)
1	0900	0.01	0.1	0.001
	0930	0.1	0.1	0.01
	1000	1	0.1	0.1
	1100	10	0.1	1.0
	1200	100	0.1	10
	1300	100	0.2	20
	1400	100	0.3	30
	1500	100	0.4	40
				Cumulative dose ~ 100
2	0900	100	0.5	50
	1000	100	0.5	50
				Cumulative dose 100

<u>Continuation – at OPD/Specialist rooms/GP:</u>

Day	Strength (microg/mL)	Dose (mL)	Total amount (microg)
6	100	1	100
This can be given on day 5, 6 or 7 (i.e. Monday, Tuesday or Wednesday of the week following the procedure)			
21	100	1	100
(i.e. 2 weeks following the previous injection)			
Maintenance:			
4 weekly	100	1	100

Duration of treatment

The usual duration of stay in hospital using a Ultra-Rush VIT protocol is 2 to 5 days.[1] With any protocol once the patient has achieved a maintenance dose the treatment will continue with subcutaneous injection on a monthly basis for the next 3 to 5 years as an outpatient.[1,4-6]

Administration

- All doses of VIT, including test doses and any other drugs e.g. adrenaline to be ordered on medication chart by the Immunology team based on the above protocol.
- VIT to be administered by Registered Nurses as per the medication chart.
- Syringes to be labelled sequentially by the PTU. Each dose should be administered as ordered. Relevant SCH Clinical Policies to be followed: 5.7 Administration of Subcutaneous Medications. (SCHN Guideline http://webapps.schn.health.nsw.gov.au/epolicy/policy/5024/download)
- Sequential doses are to be given subcutaneously as per the medication chart or as instructed by Immunology Team.
- For the Ultra-Rush protocol only the pre-prepared, single dose syringes supplied by PTU are to be used (**no mixing or diluting of the venom should occur on the ward**).
- Sequential doses should be injected in a rotating fashion in the deltoid region of both arms and/or both thighs.
- Each injection site should be marked by circling them. This is done to determine if any local reaction has occurred and to which dose.
- Doses should be administered as indicated in the protocol being used unless otherwise ordered by the Immunology Team until the VIT is completed or an adverse event occurs.

Safety and Patient Monitoring

Routine observations

- The child is to have a baseline set of Observations done prior to commencing the VIT including: Weight, Temperature (T), Pulse (P), Respiratory rate (RR), Blood pressure (BP), Oxygen Saturations (Sa02), Chest auscultation and observation for signs of rashes or hives on skin. Relevant Sydney Children's Hospital Clinical policy that is to be followed, (SCH.C.10.P.1 Pulse Oximetry Guidelines).
- P, BP, RR, $Sa0_2$ and chest auscultation should be performed by the RN 30 minutes **after** each dose or if any adverse event occurs. The frequency of these observations is to be determined by the nurse and medical officer caring for the child.
- A nursing ratio of between 1:1 and 1:2 is required during day 1 and 2 of Ultra-Rush VIT.

Adverse Events[3]

- **Small local reaction** (swelling or redness less than 5cm diameter around the injection site).
  - Continue prescribed protocol
- **Large local reaction** (swelling or redness greater than 5cm diameter around the injection site).

- Continue prescribed protocol and Page Immunology Registrar or ward Registrar to review patient.

- **Systemic Reaction** - Anaphylaxis or Generalised Allergic Reaction as defined in SCHN Anaphylaxis Guideline (Guideline number 1/C/15:9066-01:00)
    - Manage as per SCHN Anaphylaxis Guideline [Guideline number 1/C/15:9066-01:00]
    - Withhold the next dose, stay with patient and monitor closely. Page Immunology Registrar or Ward Registrar immediately to come and assess patient.

- **If symptoms worsen**
    - Continue to monitor patient closely
    - Page Immunology Registrar or Ward Registrar again and explain urgency of situation.
    - Give medication as prescribed (e.g. IM adrenaline) if instructed by the Medical officer or if unable to immediately contact the Medical officer.
    - If Respiratory or Cardiovascular Arrest is assessed to be imminent
        - Call 2222 and begin normal resuscitation procedures
          Call 2222 if no response from Immunology Registrar or Ward Registrar following administration of IM adrenaline.

References

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