12

ANAPHYLAXIS

On the final day of the Otter trail, the Vermeulen family stops for a light lunch-time snack before descending onto the beach at Nature's Valley.

Tall, athletic, 14-year-old Jan walks to the edge of the cliff and photographs the breathtakingly beautiful bay. A sharp burning sensation on his cheek causes him to brush at it. He finds a struggling bee in his hand.

The last time that he was stung he had had a severe local reaction and his whole hand and arm had swollen up such that he couldn't hold his pencil. He had been to see Dr Do-a-lot who had suggested that he carry adrenaline with him just in case his next reaction was even worse. Sister Sweet had spent time with him and his mother teaching them about anaphylaxis and how to use an adrenaline injection.

When they returned for follow-up she tested them and repeated the instruction until they were confident that they could use it if they needed to. Giving an injection can be a bit daunting if you have never done it before.

Jan has packed his small adrenaline case for the hike. It is just as well. He is suddenly not feeling at all well. He staggers back to his pack and calls his mother. His face and lips have begun to swell. He has developed hives on his chest, neck and arms, and he is having difficulty breathing. He knows that this is 'anaphylaxis', the 'killer-allergy' that Sister Sweet had taught him about.

He remembers her words. 'Your skin may swell and go red and blotchy, you may feel unwell and you may find it hard to breathe comfortably. You may even get a sore tummy.'

His mother seems calm, but her hands are shaking while she opens up the adrenaline pack and unfolds the Anaphylaxis Action Plan. She calls Mr Vermeulen over and asks him to call an ambulance. He nearly chokes on his Provita when he sees Jan. He doesn't like medical stuff.

Mrs Vermeulen lays Jan down and asks his sister to prop his feet up on his backpack. She carefully scratches the last of the sting out of his cheek, then she pushes up his baggies and injects 0.5 ml of 1:1000 adrenaline into his upper lateral thigh.

Mr Vermeulen is not calm, but he has managed to call the ambulance. Fortunately they chose to have lunch at the entrance to an escape route with easy vehicular access.

Jan is feeling less fearful, but his stomach is cramping and he is still wheezing after 20 minutes. His mother injects a second 0.5 ml of adrenaline into his thigh.

Jan feels shaky and dizzy, and his hands and face turn pale. He feels his heart racing and thumping in his chest. His breathing feels suddenly easier.

Shaunagh Emanuel,
MB ChB
Di Hawarden,
MB ChB
Allergy Diagnostic and Clinical Research Unit, UCT Lung Institute, Mowbray, Cape Town, South Africa

References

1. Simons FER *et al.* for the World Allergy Organization. World Allergy Organization Guidelines for the Assessment and Management of Anaphylaxis. *J Allergy Clin Immunol* 2011; 127 (3): 593 e1-22.
2. Resuscitation Council of Southern Africa. Algorithm: Treatment of severe anaphylaxis. 2006 www.resuscitationcouncil.co.za

Anaphylaxis is a severe life-threatening condition. All health workers should know how to recognise and treat it. Preparedness is essential as anaphylaxis is unpredictable.

The ambulance arrives and Mrs Vermeulen describes the events as well as Jan's previous allergy history and the treatment that she has given thus far.

The paramedics work quickly, inserting an intravenous line to which they attach a litre of 0.9% normal saline. He receives an antihistamine injection. An oxygen mask is placed over Jan's nose and mouth, and he is lifted into the ambulance. The paramedics call ahead to alert the casualty staff.

When he arrives at Knysna Hospital, Jan is met by Dr Richman who, in view of the severity of his condition, admits him for observation in case he has a biphasic reaction. She adds glucocorticosteroids to his treatment. He is discharged in the morning with an anaphylaxis action plan, a new adrenaline pack and a letter of referral to Dr Do-a-lot for possible bee immunotherapy.

When they attend Dr Do-a-lot's rooms, Mrs Vermeulen brings a bunch of flowers for Sister Sweet to thank her for the care that she took in preparing Jan and her to manage anaphylaxis. Had she not taught them in the empowering and engaging way that she had, they would not have recognised the signs, nor been able to treat the unexpected attack.

Dr Do-a-lot arranges bee immunotherapy for Jan.

Anaphylaxis

Clinical signs and diagnosis

The diagnosis of anaphylaxis is made clinically.

Anaphylaxis is likely when a patient suffers an illness of:

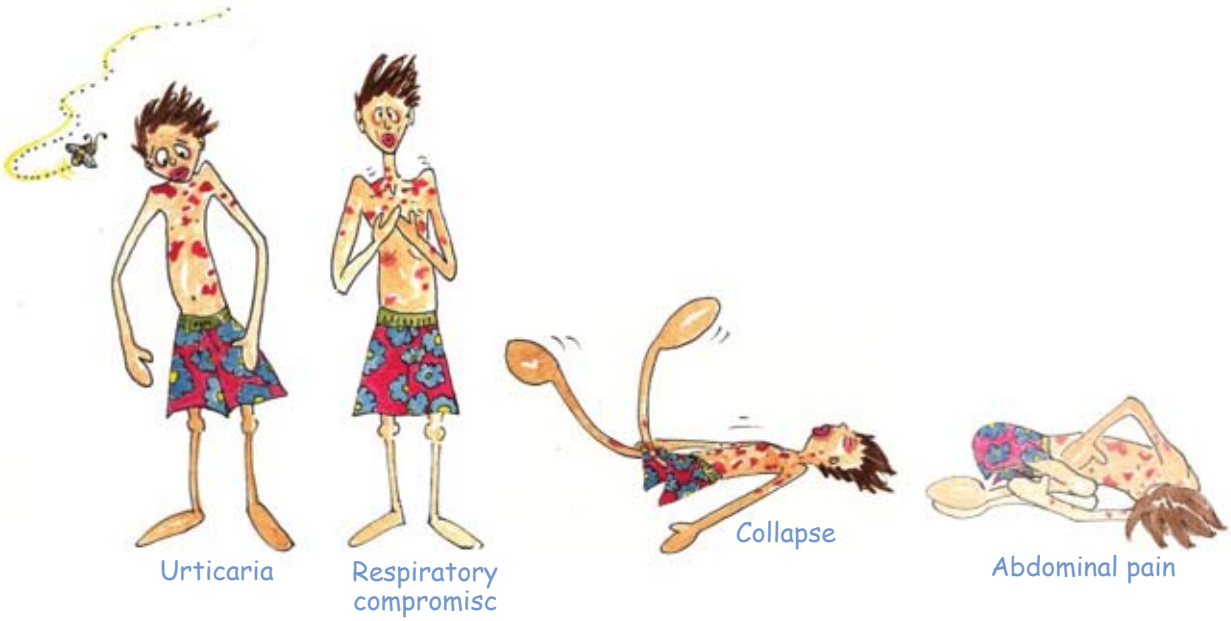
- acute onset (minutes to several hours) with involvement of the skin, mucosal tissue or both (urticaria, itching, flushing, swollen lips, tongue, uvula)

  and at least 1 of the following:
- respiratory compromise (dyspnoea, wheeze/bronchospasm, stridor, reduced peak expiratory flow rate (PEFR), hypoxaemia)
- reduced blood pressure (hypotonia (collapse), syncope, incontinence)

Persistent gastrointestinal symptoms (crampy abdominal pain, vomiting) may be part of the clinical picture.

Note that some patients, inconveniently, do not fit the typical picture.

Full diagnostic criteria are listed in the WAO guidelines.[1]



Clinical signs of anaphylaxis

Acute management of anaphylaxis

A systematic approach is critically important.

It involves the following steps:

Remove the trigger

Assess circulation, airway, breathing, mentation, skin, weight

Call for help

Give adrenaline

Intramuscular, mid-anterolateral thigh

0.01 mg/kg of 1:1 000 (1 mg/ml) solution to a maximum of 0.5 mg in **adults** and 0.3 mg in **children**. The correct dose for a 5 kg **infant** is 0.05 mg.

Depending on response, the dose can be repeated every 5-15 minutes, as needed.

Most patients respond promptly to 1 or 2 doses.[1]

Place in a position of comfort, preferably recumbent with the feet up

(Do not allow the patient to sit or stand suddenly so as to preserve fluid in the circulation and prevent empty vena cava/empty ventricle syndrome)

Give oxygen (6-8 l/min)

IVI line, fluids: normal saline (0.9%) titrated to blood pressure and cardiac rate/function)

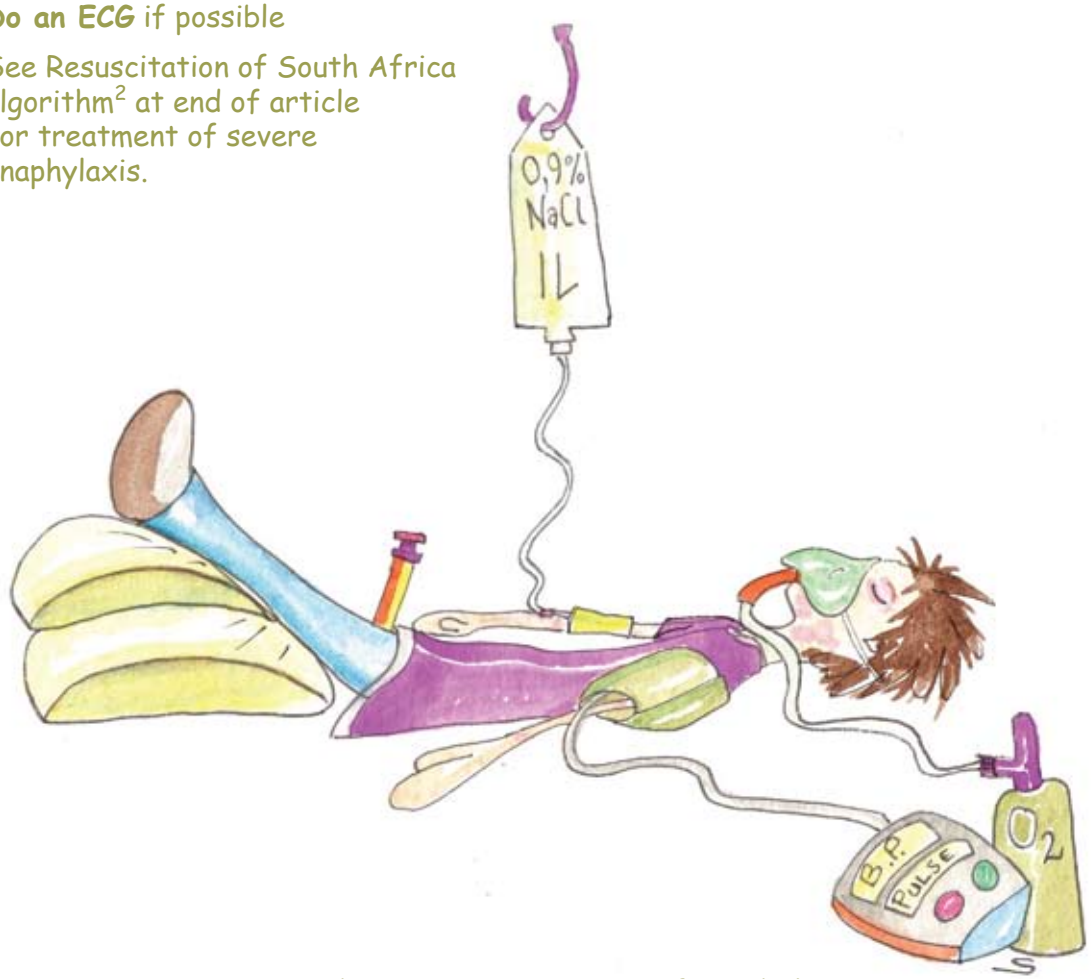
Give antihistamines, beta2-adrenergic agonists and glucocorticosteroids

Cardiovascular resuscitation if necessary

Monitor blood pressure, heart rate, respiration, oxygen saturation

Do an ECG if possible

See Resuscitation of South Africa algorithm[2] at end of article for treatment of severe anaphylaxis.



The acute management of anaphylaxis

Management on discharge

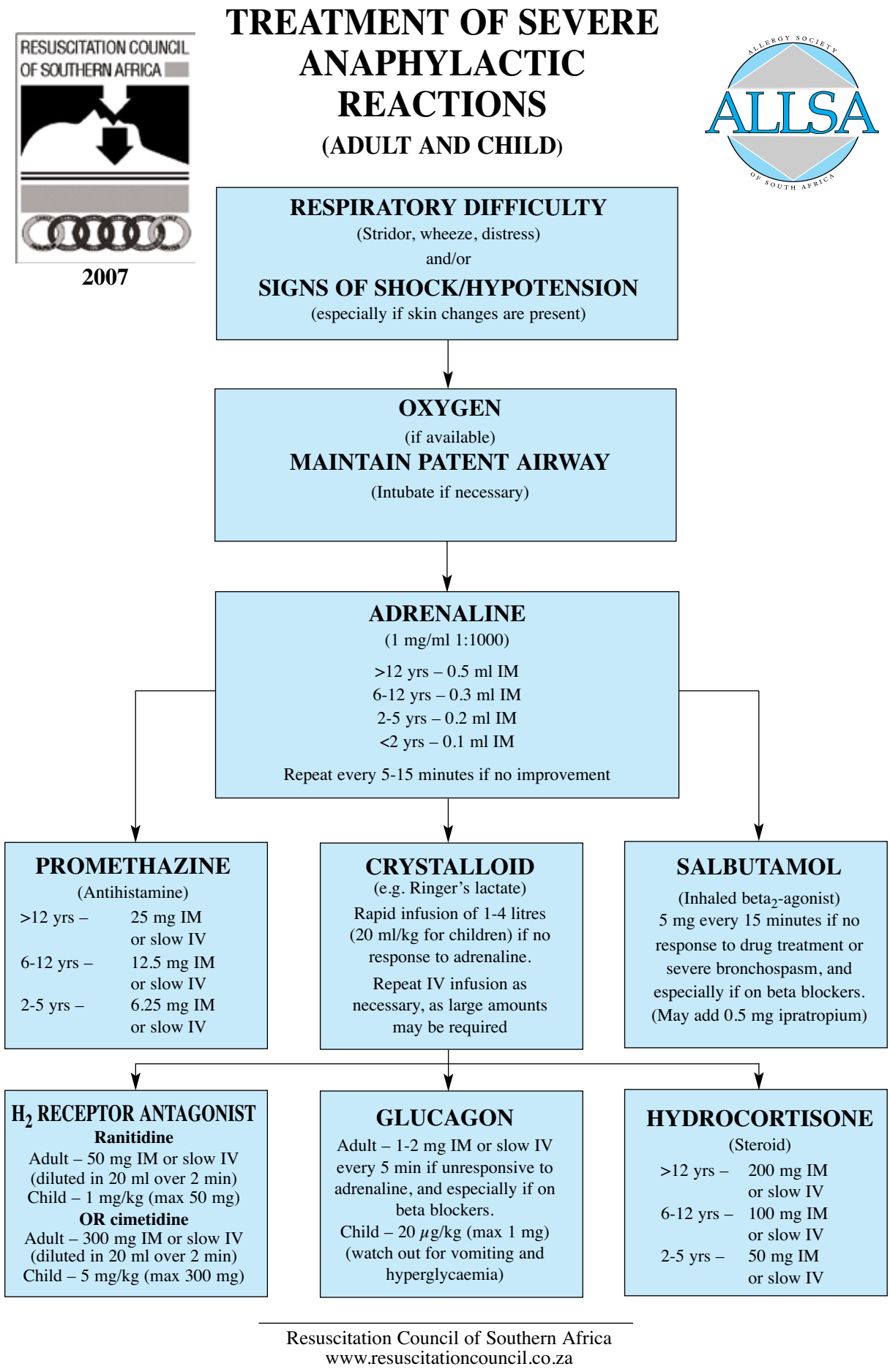
Patients should be discharged at least 4 hours after anaphylaxis depending on the severity of the reaction and factors pertaining specifically to case. Some severe cases require admission for over 24 hours because of the potential risk of a biphasic reaction.[1]

Treatment of anaphylaxis does not end with resolution of the acute episode.

The guidelines include the following as part of a comprehensive discharge plan:

- Patients should be discharged with an adrenaline injection and education empowering them and their families or caregivers to be able to use it if needed.
- They should receive a written anaphylaxis emergency action plan that they understand and can perform.
- Arrangements should be made for patients to receive medical identification in the form of a bracelet that describes their condition clearly.
- A follow-up visit with an allergy specialist should be arranged to confirm specific triggers by allergy testing. Written information about prevention of anaphylaxis recurrences in the community by avoiding specific triggers (or trigger) should be provided and discussed, and desensitisation should be considered.[1]

Management of anaphylaxis on discharge



Algorithm of treatment of severe anaphylactic reactions.