Table 1
Risk Factors for Severe Reactions to Stings

Clinical markers	Laboratory markers
Very severe previous reaction	Venom skin test
Insect species	Venom-specific IgE
No urticaria or angioedema	Basal serum tryptase
Age (>45 years), Sex (male)	Basophil activation test[a]
Multiple or sequential stings	Platelet activating factor–acetylhydrolase[a]
Medications (ACEIs)	ACE

Abbreviations: ACE, angiotensin-converting enzyme; ACEIs, angiotensin-converting enzyme inhibitors.
[a]Not commercially available.

epinephrine injectors or recommendation of venom skin tests or immunotherapy):
- High risk: severe anaphylaxis; elevated basal serum tryptase level; honeybee allergy; frequent exposure; age/medical conditions
- Low risk: patients with cutaneous systemic reactions; large local reactors; asymptomatic sensitization; during VIT; after discontinuing VIT

7. New content on VIT: protocol, procedures, problems, and special circumstances:
   - Starting dose for skin tests and for VIT: reported safe at 1 μg/mL for skin tests, 1 μg for VIT
   - Up-dosing regimens and maintenance doses: semirush and rush are safe, ultrarush associated with more systemic reactions; 50 μg maintenance dose in children, 100 μg in adults)
   - VIT in pregnancy: few data; no known problems; generally safer to continue than stop
   - Maintenance interval gradually increased from 4 weeks to 8 weeks during the initial years (first 1 or 2) of treatment and later up to 12 weeks
   - Management of adverse reactions: minimal adjustment for large local reactions; for repeated systemic reactions, try single venom with pre-medication, consider rush VIT and/or omalizumab
   - Duration: 5 years is better than 3 years; longer treatment recommended in high-risk patients; 3 years may be sufficient in children

What's Different?

There is an increasing number of ways in which the guidance contained in these practice parameters differs from that contained in the US Food and Drug Administration–approved product package insert (Table 2). The clinician should be aware of these differences and the related evidence and rationale. Ultimately, the therapeutic decisions are a matter of professional judgment and should be considered in the context of each individual patient.

Executive Summary

The primary focus of the stinging insect practice parameter over the years has been to provide a working framework for the management of stinging insect hypersensitivity. Every effort has been made to incorporate data-driven recommendations and those based on expert consensus. Since the most recent iteration in 2011, many new, relevant, and practical observations have occurred. This parameter attempts to address many of these observations and includes contemporary recommendations for this potentially lethal condition. Throughout this document, the use of the terms *venom immunotherapy, VIT, venom testing*, and *venom* refers to both venom and imported fire ant WBE unless otherwise stated.

Most insect stings produce a transient local reaction that can last up to several days and generally resolves without treatment.

Table 2
Differences Between Venom Package Insert and the 2016 Practice Parameter

Parameter	Package insert	2016 Practice
Indications for testing	History of systemic reaction	SRs; some LLRs; mastocytosis
ST technique/interpretation		
Prick	1 μg/mL	100 μg/mL (optional)
ID	0.05 mL	0.02–0.05 mL
Wheal	5–10 mm	3–5 mm
Tryptase/mastocytosis	No mention	When to measure, Clinical significance
Cutaneous systemic reactions	VIT	VIT not required (optional) at all ages
Large local reactors	No VIT	VIT not required (optional)
Rush regimens	No mention	Safe and effective
Premedication	No mention	Reduces LLRs (and mild SRs)
Starting dose	0.001–0.01 μg	1.0 μg
Cardiac medications	Standard warnings	Guidance on when to change
Children	Same as adults	Dose, duration may differ
Adverse reactions to VIT	No mention	Premedication, cluster, rush, omalizumab
Maintenance interval	4 weeks	Up to 12 weeks
Duration	Indefinite	5 years, indefinite (if high risk factors)

Abbreviations: ID, intradermal; LLR, large local reaction; SR, systemic reaction; ST, skin test; VIT, venom immunotherapy.

Marked local swelling extending from the sting site is usually an IgE-mediated late-phase reaction. The risk of a systemic reaction in patients who experience large local reactions is 4% to 10%.[1–4] More serious anaphylactic sting reactions account for at least 40 deaths each year in the United States.[5] It is estimated that potentially life-threatening systemic reactions to insect stings occur in 0.4% to 0.8% of children and 3% of adults.[6,7]

Systemic reactions are characterized by many different signs and symptoms, including any combination of urticaria and angioedema, bronchospasm, edema of the large airway, hypotension, or other clinical manifestations of anaphylaxis. The most serious anaphylactic reactions involve the cardiovascular and respiratory systems and are potentially life-threatening. The most common cardiovascular reaction is hypotension. Respiratory symptoms include symptoms of upper or lower airway obstruction. Laryngeal edema and circulatory failure are the most common causes of death from anaphylaxis.[8] Patients who have a history of a systemic reaction to an insect sting should (1) be educated in avoidance of stinging insects, (2) carry epinephrine for emergency self-administration and be instructed in its appropriate indications and administration, (3) undergo testing for specific IgE antibodies to stinging insects, (4) be considered for immunotherapy (with insect venom or fire ant WBE) if test results for specific IgE antibodies are positive, and (5) consider carrying medical identification for stinging insect hypersensitivity.

Positive serum or skin test results for venom IgE are present in more than 20% of healthy adults, especially in the months after a sting.[7] However, only 5% to 15% of those with such asymptomatic sensitization will have a systemic reaction to a subsequent sting, and most will lose the sensitivity over time.[9,10] In contrast, patients with a history of anaphylaxis to a sting have a mean of almost 50% frequency of systemic reaction to a sting.[11–15] Patients with large local reactions have less than 10% chance of a systemic reaction (and <5% chance of anaphylaxis).[2,3,16] However, no test predicts the severity of a sting reaction (other than basal serum tryptase).

Identification of the insect responsible for the sting reaction can be very useful in establishing the diagnosis, prescribing treatment, and educating patients in avoidance measures. Different insects have different nesting and behavioral characteristics that can be distinct and specific. For example, the most common species of yellow jackets in the United States build their nests in the ground and therefore can be encountered during yard work, farming, and