



# The ToxIC North American Snakebite Registry

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## Background

- Snakebite affects thousands of people in the US annually, and can cause significant morbidity and mortality. Despite the large impact on victims, current understanding of venom pathophysiology, predictors of severity, treatment strategies, and long-term outcome is limited. The Toxicology Investigators Consortium (ToxIC) North American Snakebite Registry (NASBR) was established to collect de-identified data regarding all aspects of snake envenomation.

## Research Question

- Can the NASBR serve as a research tool to collect a large amount of data from multiple toxicology centers across the US?

## Methods

- Data reported to the NASBR between March 1 and October 24 2013 were reviewed. Results are reported using descriptive statistics.



Site:	# Cases:
Phoenix	42
Dallas	20
Fresno	10
San Antonio	8
Charlotte	6
St Louis	6
Salt Lake City	5
Denver	1

## Results

8 Medical Toxicology sites representing 7 states across the US contributed 99 cases. (see map) One non-native bite was excluded.

### Patient demographics and characteristics:

Of 98 subjects, 72% were men. 19% were <13 years, 15% were 13-18 years, 52% 19-65 years, and 11% > 65 years.

40% had co-morbidities, with 8% on anti-platelet or anticoagulant medications; 7% had acute ethanol exposure (use within 4 hr).

### Snakes and venom effects:

Bites were from 64 rattlesnakes, 23 copperheads, 2 cottonmouths, and 10 unknown crotalids. 4 bites were considered dry.

13% of snake interactions were reported as intentional.

46% were upper extremity and 54% lower extremity bites.

93% of patients had local swelling and 43% erythema. Hemorrhagic bullae or necrosis was reported in 14%.

38% had hemotoxicity (19% platelets < 150 mm/K3, 13% fibrinogen <170mg/dL, 30% PT>15 sec). 3 patients had minor early bleeding.

6 patients had neurotoxic symptoms, with 5 reporting numbness or paresthesias and 2 with fasciculations on physical examination.

4 patients had rhabdomyolysis, with CPK >1000 IU/L.

### Treatments:

6 patients had a tourniquet placed prior to healthcare presentation.

10% received prophylactic or empiric antibiotics. 1 patient, who underwent numerous procedures including I&Ds, a digital nerve repair and a skin graft, was treated for a late infection.

84% received antivenom (AV). 7% (6/82) received prophylaxis against AV reaction. 7 adverse reactions were reported: 4 rash, 1 bronchospasm, 1 hypotension, and 1 subjective perioral numbness.

6 patients underwent procedures, including 4 wound debridements and 2 fasciotomies. Compartment pressure was not documented.

## Results continued

### Follow up and outcomes:

39% of patients had at least one set of follow-up labs.

4 patients were readmitted to the hospital for late hemotoxicity. One was readmitted 2 days post-bite for worsening thrombocytopenia and vaginal bleeding. Three were readmitted 4-7 days post-bite, all with late thrombocytopenia and two with complete defibrination. One of these patients was admitted a third time 15 days post-bite for a second thrombocytopenia recurrence.

Length of stay was <24 hrs in 33%, 25-48 hrs in 42%, 49-72 hrs in 18%, and > 72 hrs in 7% of patients.

There were no deaths.

## Discussion

- These data provide a nationally representative sample of snakebite victims seen at the bedside by medical toxicologists.
- There are countless opportunities for research into the factors leading to snakebite, contributing to morbidity following snakebite and affecting short and long term outcomes in envenomed patients.

## Conclusion

- The NASBR is a powerful tool for gathering and studying a vast amount of information related to snakebite, and provides a unique opportunity to study many aspects of snake envenomation, including risk factors, rare effects, response to interventions, and outcomes.

