

# TAKING THE FEAR OUT OF POISON

## Center fields the tough calls

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Keith Boesen smiles as he walks over to a terrarium filled with a dozen or more small, straw-colored scorpions. He opens the top, reaches in and deftly captures Arizona's most venomous scorpion by the telson or tail. The creature wriggles a bit, then settles down comfortably on the back of Boesen's left hand.

Meet the director of the Arizona Poison and Drug Information Center on the campus of the University of Arizona.

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Boesen's office resembles many other offices on campus – except for the five or six terrariums containing venomous scorpions and spiders.

Boesen and his staff of pharmacists provide assistance to the public 24 hours a day, seven days a week. The poison control center, located within the UA College of Pharmacy, fields calls from people experiencing toxicology-related events including poisonings, drug interactions and scorpion stings, but that's not all they do.

In addition to providing a hotline for the public, the poison control center is a health care provider, a research center and an outreach program. The center also trains pharmacy and medical students about the science of toxicology.

"The only place clinical toxicology is taught is a poison control center," Boesen says.

### One bad scorpion

The Arizona bark scorpion, known to scientists as *Centruroides sculpturatus* or *Centruroides exilicauda*, has a terrible reputation. Before the use of antivenom and the advent of modern

### BY THE NUMBERS

- 16 percent of calls to the Arizona Poison and Drug Information Center involve bites and stings.
- 47 percent of calls involve accidental exposures in young children.
- 7 out of 10 poison center callers manage their incidents at home.
- Poison centers produce savings in healthcare costs and lost productivity.

### HERE'S HELP

No matter where you are in the United States, call 1-800-222-1222 to talk to an expert in toxicology.



KEITH BOESEN, director of the Arizona Poison and Drug Information Center, carries on the legacy of Albert Picchioni. He is behind an aquarium of scorpions.

the birth process, a scorpion mother catches each baby and helps it climb onto her back. Scorpion young hitch a ride until their first molt, about 7-21 days after birth, after which they're ready to hunt their own prey.

### The sting

Scorpions don't bite. They sting by injecting venom through a hypodermic-like projection, called the aculeus, at the end of the tail. The process of being stung is called envenomation. A bark scorpion sting can cause pain that's either excruciating or no worse than a bee sting, depending on the sting site and the size or health of the victim.

Justin Schmidt, a UA entomologist, created a "sting index" ranking the pain of wasp, ant and bee stings. To create his index, Schmidt subjected himself to more than 150 stings. Enduring the sting of a bark scorpion for the sake of science, however, is not part of his research plan.

"I wouldn't intentionally be stung by a bark scorpion," says Schmidt, "as the sting ... would only cause misery. Of course... I would probably be willing to suffer a bark scorpion sting for a paid work trip to a Peru Biological Station to study wasps."

### The venom

The primary components of bark scorpion venom are toxins that affect the nervous system by altering the action of pores, called ion channels, located in nerve cell membranes.

These ion channels act like on/off switches. Bark scorpion venom locks these switches in the "on" position, causing the body to experience unusual and often uncomfortable or painful effects.

Although victims don't always know what kind of scorpion they've encountered (Arizona has about 30 species of scorpion) the symptoms of a bark scorpion sting are distinctive.

A bark scorpion victim might experience immediate pain at the site of the sting with minimal swelling, numbness and tingling, drooling and unusual eye sensations or movements. The site of the sting might be sensitive to touch, pressure, heat and cold.

Young children, and occasionally adults, can experience more serious symptoms including agitation, thrashing and breathing problems. Treatment with antivenom is preferred when an airway is threatened.

According to Boesen, in the last 50 years only three people have died following a bark scorpion sting. One of

these deaths was the result of a rare allergic reaction to the sting, one death was the result of an allergic reaction to an early generation antivenom and the cause of the third death is uncertain.

"Deaths are very few and far between since the advent of antivenom," Boesen says. Many patients don't need antivenom to recover, but a few might need the high level of care provided by an intensive care unit.

### Poison Control Centers

The poison control center movement started in the United States in the 1950s. After World War II, the use of potentially hazardous household chemicals and drugs became more common, increasing the incidence of suicide and childhood poisonings.

To manage the increased number of intentional and unintentional poisonings, the medical community developed a new model of delivering emergency care and information about hazardous substances – the poison control center. The first U.S. poison control center was opened in Chicago in 1953, but very quickly these centers spread across the country.

There are two models for poison control centers: a center staffed by nurses with physician backup or a center staffed by pharmacists. The center in Tucson,

established in the 1950s by Albert Picchioni (professor of pharmacology and toxicology, researcher, pharmacist and educator) follows the second model.

In the early days of the center, Picchioni devised an elaborate card catalog system with information about toxic substances, their chemical composition and treatments for exposures to these substances. The card catalog is displayed in the entryway to the UA poison control center. According to Boesen, Picchioni's references are still used on occasion.

In 1980, Picchioni convinced the Arizona legislature to fund the poison control center. As the result of recent economic difficulties, however, funding to the center was slashed dramatically.

On a recent Tuesday afternoon, poison control center staff Andrea Clements and Maryam Fazel (both pharmacists) and pharmacy student Mahdiah Fazel, Maryam's daughter, waited for calls.

"The poison center is the people who answer the phone. If I wasn't here today, the calls would still be answered," Boesen says.

For the center's director, the most gratifying calls are the calls where panicked sting victims (or their parents) hear that death is not imminent.

### Scorpion season

With our unseasonably warm spring weather, scorpions are more active. Orders for Anascorp were higher than expected during January and February.

Anascorp is the new bark scorpion antivenom approved by the Food and Drug Administration after successful clinical trials led by Leslie Boyer, a University of Arizona primary investigator, physician and toxicologist.

While the likelihood of being stung by a scorpion is quite low and excellent treatment options are available, it's still wise to watch where you put your hands and feet.

After all, as Rare Disease Therapeutics says, "It's rare until it happens to you."

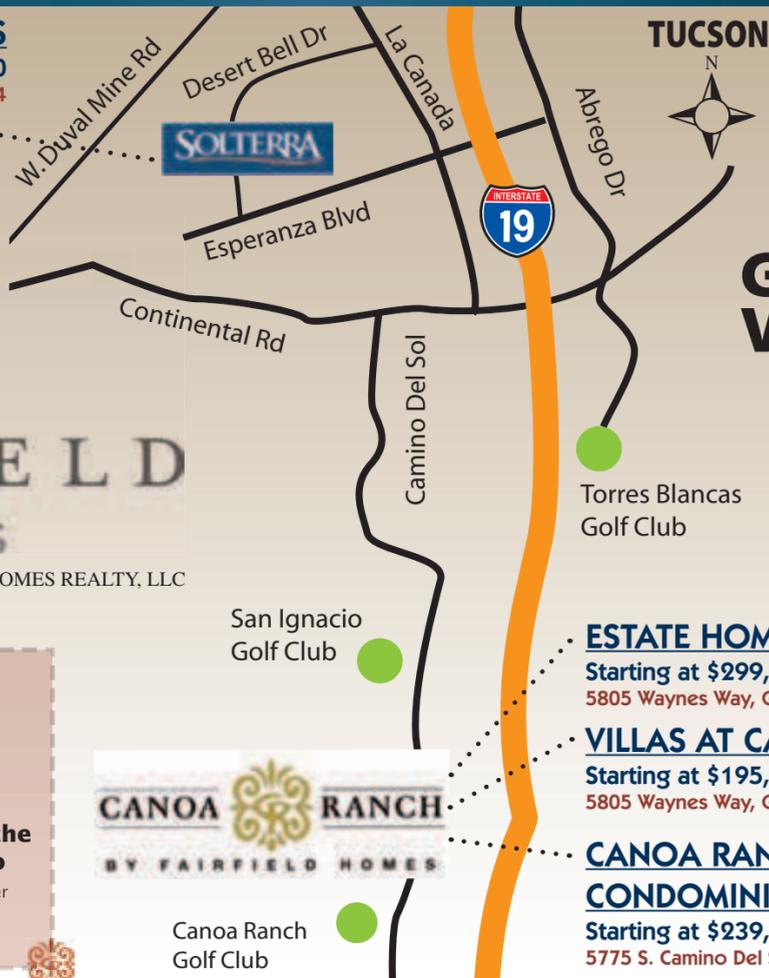
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