



Poison HOTLINE

Partnership between Iowa Health System and
University of Iowa Hospitals and Clinics

January 2012



Did you know

Small magnets, like those found in children's toys, can cause significant injury when swallowed.

If two or more magnets, or a magnet plus a metallic object, are swallowed, they can attract to one another through intestinal walls. When tissue from the GI tract gets sandwiched between two magnets or between a magnet and a piece of metal, pressure necrosis and perforation may occur.

An x-ray to determine the number and location of the magnets and pieces of metal should be done emergently after ingestion. For questions about this or any other poison exposure, call the ISPCC at

1-800-222-1222.

Overdoses of Drugs That Cause Sodium Channel Blockade and Widening of the QRS

The flow of ions in and out of certain cardiac cells is necessary for the proper conduction of electrical signals in the heart. Sodium ions flow into these cells during systole, and potassium ions flow out of these cells during diastole.

Sodium channel blockers slow sodium flow through sodium channels of these cardiac cells during phase 0 of the action potential. This blockade causes a widening of the QRS complex on the electrocardiogram. There is a diverse group of medications that block sodium channels, and tricyclic antidepressants (TCA's) are a classic example of a sodium channel blocker.

A short list of common sodium-channel-blocking agents includes:

- Type Ia anti-arrhythmics: disopyramide, procainamide, quinidine
 - Type Ic anti-arrhythmics: encainide, flecainide, propafenone, moricizine
- Tricyclic antidepressants: imipramine, amitriptyline, nortriptyline, etc.
- Beta-blockers: propranolol, acebutolol
- Older-generation anti-psychotics: thioridazine, mesoridazine, etc.
- Older-generation antihistamines: diphenhydramine, chlorpheniramine, etc.
- Others: propoxyphene, quinine, carbamazepine, bupropion, venlafaxine

This list is by no means complete as there are many other medications not listed which block sodium channels when taken in overdose.

While overdoses of sodium channel blocking drugs produce a wide variety of symptoms including arrhythmias and seizures, they characteristically also cause a widening of the QRS. The normal QRS duration is up to 100 mSec. When the QRS is greater 100 mSec in the setting of a sodium channel blocker overdose, serum alkalization with sodium bicarbonate is recommended. Serum alkalization has been best studied with TCA overdoses and it has been shown that the combination of both alkalization and sodium loading act synergistically to reverse the sodium channel blocking effects.

The next time you have a patient who has taken an unknown overdose, is deteriorating and has a wide QRS on the monitor, you may want to consider giving a couple ampules of sodium bicarbonate if there is a suspicion the patient may have ingested a sodium channel blocking drug.

*Howard Burns, MD, FACMT
Associate Medical Director, ISPCC*

POISON
Help
1-800-222-1222

Post and share this edition of **Poison Hotline** with your colleagues. Send comments or questions to Poison Hotline, 712-234-8775 (fax) or nobletf@ihs.org. To subscribe or unsubscribe from this distribution list, contact the Iowa Poison Center education office at 712-279-3717. Read past issues of **Poison Hotline** at www.iowapoison.org.