



Department of Health and Social Services  
William J Streur, Commissioner

Division of Public Health  
Ward B Hurlburt, MD, MPH, CMO/Director

Editors:  
Joe McLaughlin, MD, MPH  
Louisa Castrodale, DVM, MPH

3601 C Street, Suite 540  
Anchorage, AK 99503

<http://www.epi.Alaska.gov>

Local (907) 269-8000  
24 Hour Emergency 1-800-478-0084

Bulletin No.27 October 6, 2011

## Psychoactive “Bath Salts” Toxicity in Alaska—A Case Series

### Introduction

This Bulletin presents case reports of three adults with presumed psychoactive “bath salts” (PABS) toxicity who were cared for at an Anchorage hospital in May 2011.

“Bath salts” is a term used to describe a class of designer drugs intended to have pharmacologic effects similar to controlled substances but to be chemically distinct from them, thus avoiding legal control.<sup>1</sup> Sold in powder form, they may be marketed under such names as plant food, research chemicals, or pond water cleaner, and labeled “not for human consumption” in order to avoid regulation. These drugs typically contain synthetic cathinones, which include the following central nervous system stimulants: 3,4-methylenedioxypyrovalerone (MDPV), mephedrone, and methylone (bk-MDMA).<sup>2</sup> They generally cause a considerable sympathomimetic effect, and desired effects include increased energy, euphoria, enhanced sexual sensation, and synesthesia. Documented adverse reactions include agitation, hyperthermia, hyponatremia, myocarditis, rhabdomyolysis, psychosis, and seizures. When PABS are taken orally, intranasally, intravenously, or rectally, their effects occur with doses as low as 3–5 mg, and the average dose ranges from 5–20 mg.<sup>3</sup> The risk of overdose is high, since packages contain up to 500 mg, and some labels recommend increasing dosages to >50 mg.<sup>3</sup> Because the desired effects of these drugs peak after 1.5 hours when taken orally and then tend to wane rapidly after 3–4 hours,<sup>3</sup> users may re-dose frequently, potentially leading to increased toxicity. The long-term use of PABS leads to tolerance, and abstinence results in psychologic withdrawal and craving.<sup>3</sup>

While many states have banned the sale of select synthetic cathinones commonly found in PABS, they remain unscheduled under the Federal Controlled Substances Act, and are widely available on the Internet. The Drug Enforcement Agency is working to register these compounds as Schedule I substances under its emergency scheduling authority.<sup>4</sup>

### Case Series

*Case 1:* A 24-year-old man on the general medical service was being evaluated for anxiety as a possible contributor to ongoing abdominal pain. Within 24 hours of admission, he displayed paranoia, tachycardia and restlessness. He denied substance abuse other than cannabis and hydrocodone. Laboratory results and physical examination were unremarkable, other than a resting heart rate of 115 beats per minute. A urine drug screen showed only cannabinoids and nonspecific opioids. His symptoms improved after a few hours, but then abruptly returned. A packet of “bath salts” was found when the patient went through his belongings with staff. A repeat urine drug screen 6 hours later was unchanged. The patient admitted to rectal administration of the “bath salts” a few hours prior to admission, and then insufflation during his hospital stay. Without access to this powder, no further tachycardia or restlessness were observed. He experienced no withdrawal symptoms other than fatigue and mild anhedonia. While his “bath salts” were not formally analyzed, the patient was under the impression that they contained MDPV.

*Case 2:* A 55-year-old woman was admitted to the critical care service following a cardiac arrest requiring defibrillation for ventricular fibrillation within 24 hours of ingesting crack cocaine and “bath salts.” On admission, a urine drug screen was positive only for cocaine. On evaluation, she had an anterolateral myocardial infarction. She recovered well following thrombectomy and coronary stenting.

*Case 3:* A 42-year-old man on the general medical service was being evaluated for delirium and concern for serotonin syndrome. On admission, he was delirious, mildly hyponatremic (sodium: 127 mEq/L), disoriented, and swatting at the air. His temperature was elevated at 100.2 °F. His outpatient medications included fluoxetine (40 mg daily) and loratadine. He took a dextromethorphan-containing cough syrup in small amounts for 2 nights prior to admission, reportedly for “allergies.” A urine drug screen was positive only for cannabinoids. Laboratory results and physical examination ruled out infection and serotonin syndrome. On interview, he admitted to regular abuse of “bath salts” labeled as containing methylone. He reported last using “bath salts” the day before admission. On discussion with the patient, the psychiatry service reviewed the possible interactions between methylone, dextromethorphan, and fluoxetine, the overlap between his lab findings, and the toxicity of methylone.

### Discussion

Abuse of “bath salts” has been rapidly increasing in the United States, with 303 calls to Poison Control Centers (PCC) nationwide in 2010, and 4,720 calls through August 31, 2011.<sup>5</sup> The Oregon PCC reported that so far in 2011, they have received 14 calls regarding PABS toxicity concerns in Alaska.

This case series demonstrates the wide age range of persons who choose to abuse these compounds, and highlights several potential dangers of “bath salts” abuse. First, severe overdoses may require treatment and monitoring in the intensive care unit.<sup>3</sup> Second, they are often abused in combination with other drugs, and their effects can be quite variable, as these drugs contain unpredictable types and amounts of psychoactive synthetic substances.<sup>3</sup> Finally, routine drug screens do not detect PABS.

### Recommendations

1. As the active substances found in “bath salts” are not detectable by standard drug screening, health care providers should always consider including “bath salts” in substance abuse screening discussions.
2. Providers should consider synthetic cathinones in the differential diagnosis for a possible sympathomimetic presentation or toxidrome, and be aware that these substances may be present in polydrug ingestions.
3. Because there is no specific antidote or reversal agent for these drugs, providers should treat these patients by appropriately managing symptoms, and remain aware that patients may need physical restraints and high doses of sedatives to prevent self-harm or harm to others.<sup>3</sup>
4. Providers are encouraged to call the Oregon PCC not just for medical toxicologic consultation, but also to report all “bath salts” intoxication cases they encounter (phone: 800-222-1222).

### References

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