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# The nursing implications of bath salts abuse: A learning tool and curriculum for emergency department nurses

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The Nursing Implications of Bath Salts Abuse: A Learning Tool and Curriculum for Emergency

Department Nurses

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A Project Presented to  
the Faculty of the Undergraduate  
College of Health and Behavioral Studies  
James Madison University

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in Partial Fulfillment of the Requirements  
for the Degree of Bachelor of Science in Nursing

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by Molly Ann Brennan

May, 2014

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Accepted by the faculty of the Department of Nursing, James Madison University, in partial fulfillment of the requirements for the Degree of Bachelor of Science in Nursing.

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**Bath Salts Abuse Learning Tool (Pamphlet) sent in separate document**

## Senior Honors Project Reflection Essay

Molly Brennan

The development of my Senior Honors Project has been both a trying and tremendously rewarding experience. Over the course of this project, I have been able to investigate a topic that is near and dear to my heart, and to create a product that I hope will impact many nurses and patients in the future. My Senior Honors Project is focused on the nursing implications of bath salts abuse. The management of bath salts abuse has been both a challenge and a gray area within the healthcare system in recent years, and has affected me directly within my practice.

During December of 2011, while working as an Emergency Medical Technician in northern Virginia, I was dispatched on a call that opened my eyes to the challenges presented by drugs of abuse. In 30-degree weather, I found my patient naked in the middle of a busy highway intersection, crawling on all fours, growling at passing vehicles. Her words were incomprehensible, and she was extremely combative towards myself, my crew, and the law enforcement personnel on scene. This woman's skin was also notably hot to the touch. Upon our arrival at the nearest Emergency Department, I noted a visible deflation in the department staff's demeanor. I observed a lack of clarity among the staff about how to care for this woman, or what could possibly be wrong with her. Upon leaving the department, the patient was in restraints, accompanied by two security officers, and was still thrashing about and growling. Although I have wondered since that day, I will never know what happened to her.

Three months later, while completing my Mental Health Nursing clinical rotation at Rockingham Memorial Hospital, I had the privilege of sitting in on a continuing education presentation for hospital nurses and physicians. The presentation was given by representatives of

a local agency, which specializes in the rehabilitation of bath salts abuse patients. During this presentation, I had a bit of an “aha” moment. Although I of course could not be sure, I felt that I could finally understand what had happened to my growling, naked patient three months earlier. I was immediately interested in this topic, and the dangers of this drug to an individual’s physical and mental health. Conveniently, this occurred at about the time I was trying to develop an idea for my Senior Honor’s Thesis.

In May of 2013, I submitted my Senior Honor’s Project Proposal, with the full intention of completing a systematic review of the literature. This review was anticipated to cover the acute, chronic, and community health implications of bath salts abuse for nurses. I realized quickly when beginning my research that all three topics would be far too much information for one well-written review to cover. For this reason, I decided to narrow my research to focus on the acute implications of bath salts abuse. I continued in this research throughout the fall of 2013, scouring research databases, and developing the bones of my paper and the point I would be trying to make.

During the early spring of this year, my plans for the project changed dramatically. The development of my paper was lacking, as well as my motivation. I found myself toying with the idea of withdrawing from Honors 499C, as I felt that I did not have adequate time to put into the development of a quality research paper. However, my faculty advisor and the Nursing Honor’s Liaison presented me with other options regarding the final product of my project. Although discontinuing the project was on my mind, I had invested so much of my time and heart into research and the initial development of my paper that I was eager to learn of other options. I ultimately chose to transform my original plan for a systematic literature review into a learning tool and curriculum for Emergency Department nurses. This tool would take the shape of an

informative pamphlet, accompanied by a PowerPoint presentation to supplement learning. The learning materials that I have created are based on the information I obtained and collaborated through extensive research. My goal is to distribute my materials to local Emergency Department clinical educators in the coming weeks, and for these tools to aid them in teaching their nurses about the implications of bath salts abuse on their practice. I also will be presenting my materials to the nurses at Arbor House, a crisis intervention program for psychiatric illness patients.

Although the number of bath salts abuse cases is on the decline, the problem persists that Emergency Department staff members of many hospitals are unknowledgeable about the presentation and recommended care of these patients. Media coverage of cases of bath salts abuse appears far less often than it has in recent years, however patients continue to present to Emergency Departments and other clinical facilities for this problem. Nurses are in need of an understanding of how to care for these patients, and I am excited to be able to provide this learning tool to even a small fraction of them.

Slide 1

Bath Salts Abuse (BSA)

Molly Brennan  
James Madison University School of Nursing  
Class of May, 2014

This slide is a title slide for a presentation. It features a light blue header with the title "Bath Salts Abuse (BSA)" in a dark grey font. Below the header, the presenter's name "Molly Brennan" and affiliation "James Madison University School of Nursing, Class of May, 2014" are centered in a smaller, dark grey font. The slide has a thin white border and is set against a light blue background.

Slide 2

What are 'Bath Salts'?

- A drug comprised of a mixture of man-made "synthetic cathinones" as well as a multitude of other chemicals.
- The most common synthetic cathinones found in bath salts are mephedrone and methylenedioxypropylvalerone (MDPV).
- These chemicals are similar in makeup to MDMA, Ecstasy, and amphetamines.

This slide is titled "What are 'Bath Salts'?" and contains three bullet points. The text is in a dark grey font. The slide has a thin white border and is set against a light blue background.

Slide 3

What are 'Bath Salts'?

- Stimulate release of norepinephrine, serotonin, and dopamine, as well as block reuptake
- Alter the characteristics of serotonin
- Cause psychoactive effects

This slide is titled "What are 'Bath Salts'?" and contains three bullet points. The text is in a dark grey font. The slide has a thin white border and is set against a light blue background.

Slide 4

### What are 'Bath Salts'?

- Produce a stimulant effect - similar to a combination of LSD, cocaine, and heroine
- Have a lasting effect on the body and the brain, unlike LSD, cocaine, or heroine

Slide 5

### History of 'Bath Salts' Production

- Synthetic cathinones are derived from the properties of khat, a naturally occurring stimulant
- Leaves of khat plant are chewed customarily in Eastern Africa and the Arabian Peninsula
- Production originated in Israel, where cathinone "Hagigat" first appeared in the early 2000s

Slide 6

### History of 'Bath Salts' Use

- First evidence of usage in the U.S. in 2007
- First clinical reports of synthetic cathinone use as drugs of abuse appeared in 2008, with a dramatic increase in 2009

Slide 7

### Legality of 'Bath Salts'

- Originally legal and marketed as "safe"
- By April 2011, all states within the U.S. placed a ban on bath salts use and sale
- In July 2012, President Obama signed a bill that banned bath salts and all derivatives of bath salts
- Even so, bath salts are still available throughout the U.S., Europe, and the Internet

Slide 8

### Trends of 'Bath Salt' Use

- Originally were sold legally in head shops, smoke shops, and gas stations under the names "bath salts", "plant food", and others
- Common street names include Super Coke, Ivory Wave, White Lightning, and others
- Sold in small packages labeled "not for human consumption" which contain a fine white or off-white powder

Slide 9

### Trends of 'Bath Salt' Use

- In 2009, U.S. Poison Control Centers received no calls about bath salts intoxication
- In 2010, there were 304 calls across the country
- In 2011, this number increased to 6,138
- The number of calls decreased from 2011 to 2012 with the enactment of legislation

(The number of calls to Poison Control is only an indication of use patterns, and does not necessarily represent the total number of cases of use)

Slide 10

### Trends of 'Bath Salt' Use

- Typical user is male between ages of 20-29 with history of substance abuse or psychological illness
- Accidental intoxication in children under the age of 12, 16% of these were life-threatening
- Neonatal withdrawal reported in the infants of women who consumed the drug while pregnant

Slide 11

### Trends of 'Bath Salt' Use

- Bath salts are often used with other drugs (tobacco, alcohol, cannabis, cocaine) complicating effects and diagnosis
- Users report drug to be "addictive" despite reports of unwanted effects

Slide 12

### Routes of Administration

- Insufflation ("snorting")
- IV injection
- IM injection
- Ingestion
- Rectal
- In a study of 35 cases of BSA evaluated by the Michigan Department of Community Health, there was **no correlation between route of administration and the severity of resulting illness**

Slide 13

| Signs and Symptoms (S/S) of BSA   |   |
|---|---|
| Psychological S/S   | Physiological S/S   |
| <ul style="list-style-type: none"><li>• Paranoia</li><li>• Insomnia</li><li>• Hallucinations</li><li>• Memory Loss</li><li>• Delusions</li><li>• Fear of nonexistent threats to self</li><li>• Combativeness</li><li>• Severe Agitation</li></ul> | <ul style="list-style-type: none"><li>• Sweating</li><li>• SOB</li><li>• Muscle Spasms</li><li>• Dizziness/Vertigo</li><li>• Blurred Vision</li><li>• Headache</li><li>• Chest Pains</li><li>• Hyperthermia</li><li>• Tachypnea</li><li>• Palpitations</li><li>• Dry Mouth</li><li>• Nausea/Vomiting</li><li>• Hypertension</li></ul> |

Slide 14

| Diagnosis of BSA   |
|--|
| <ul style="list-style-type: none"><li>• Suspect BSA if previous signs are present, and history includes substance abuse</li><li>• Diagnosis of relies on ruling out other possible causes of signs and symptoms (differential diagnoses)</li></ul> |

Slide 15

| Diagnosis of BSA   |
|--|
| <ul style="list-style-type: none"><li>• Standard drug screens cannot detect bath salts</li><li>• Although tests have been developed for the detection of MDPV and mephedrone, very few labs have them</li><li>• Tests are very expensive, and not available to most U.S. hospitals</li><li>• Physicians must rely on absence of differential diagnoses to diagnose BSA</li></ul> |

Slide 16

### Possible Differential Diagnoses

- Delirium
- Infection
- Psychiatric Illness
- Traumatic Brain Injury
- Electrolyte Imbalance
- Metabolic Disorders
- Endocrine Disorders

Slide 17

### Treatment of BSA

- **Largely supportive** and guided by symptoms and complications
- Assessment of cardiac injury is imperative (troponin, CK)
- **Benzodiazepines** recommended for treatment of psychotic symptoms
- N-Acetylcysteine has been used to minimize hepatic damage - further evaluation of indication needed

Slide 18

### Serious Complications of BSA

- **Excited Delirium**
  - “an agitated delirium with skeletal muscle damage proceeding in some cases to renal failure and death.” – Penders et. al
  - Delirium, severe agitation, and physiological excitation which develops over a short period of time
  - Associated with drug use and psychiatric illness
  - Has been noted in cocaine use with fatal effects

Slide 19

### Serious Complications of BSA

- **Compartment Syndrome**
  - Has been noted in at least three cases
  - One case of compartment syndrome of the back muscles which is extremely rare
  - No apparent link to route of administration
  - No other precipitating factors

Slide 20

### Serious Complications of BSA

- **Necrotizing Fasciitis**
  - One case noted of rapidly progressing necrotizing fasciitis associated with IM injection
  - Presented originally as cellulitis, rapidly deteriorated
  - This patient lost her entire arm, and part of her abdominal and chest wall
  - A risk with all injectable drugs, often difficult to diagnose

Slide 21

### Serious Complications of BSA

- **Disseminated Intravascular Coagulation (DIC)**
  - At least four documented cases of confirmed DIC resulting from bath salts abuse.
  - No apparent link to route of administration
  - Two cases resulted in death, confirmed by the medical examiner to be "death by toxic effects of MDPV"

Slide 22

### Serious Complications of BSA

- Rhabdomyolysis
  - Breakdown of muscle tissue releases myoglobin into blood, which is toxic to the kidneys
  - Causes decreased urine output, dark red urine, general weakness, and muscle aching
  - Serum creatine phosphokinase (CPK) level will be elevated
    - Normal range: 10-120 mcg/L
  - Found in numerous case reports of BSA. Some patients have recovered on dialysis, others have died

Slide 23

### Serious Complications of BSA

- Persistent psychosis and hallucinations
  - Last up to years after use, in some cases not yet resolved
  - Some of these users have been first-time users, while others had used the drug multiple times
  - Electroconvulsive therapy used in one case, led to improvement

Slide 24

### Serious Complications of BSA

- Multiorgan Failure
  - Renal and hepatic failure noted in multiple case reports
  - Respiratory failure has been reported
  - Organ system failures may be due to hyperthermia (up to 109°F) and agitation, or the effects of the drug itself

Slide 25

### Nursing Implications of BSA

- Continued education by nurses is vitally important to staying up to date on these drugs and others
  - Bath salts are only one of a multitude of new “designer drugs” available to users that are not well known in healthcare
  - Continuing education and research keeps nurses up to date on current risks and issues affecting their patients

Slide 26

### Nursing Implications of BSA

- Ensure safety of self and staff
  - These individuals can be highly aggressive and exhibit brute strength
  - Security personnel whenever possible
  - Very difficult, if not impossible to “talk down” these individuals

Slide 27

### Nursing Implications of BSA

- Thorough initial and ongoing assessment is key to the patient’s survival
  - Evidence of route of administration
    - Track marks, irritated nasal passages, needle marks
  - Assess for cardiac, renal, hepatic, respiratory, musculoskeletal, and psychological complications
  - Assess for changes in mental status and vital signs

Slide 28

### Nursing Implications of BSA

- Be aware of the patient's risk for harm to self and others
  - One to one monitoring
  - Security personnel
  - Restraints

Slide 29

### Nursing Implications of BSA

- Obtain detailed history of substance abuse from the patient/family
  - History of Bath Salts use
  - History of other drug use
  - Were other drugs used simultaneously?

Slide 30

### Nursing Implications of BSA

- If restraints needed – reassess per protocol to minimize risk of complications
- Due to musculoskeletal complications associated with excited delirium, **restraints may increase risk of death in BSA patients**

Slide 31

## Nursing Implications of BSA

- Patient education
  - Educate about the dangers of these drugs
  - Educate about addictive properties and deadly complications

Slide 32

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## **Evaluation of Learning Questions for use by Clinical Educators**

- 1) What characteristics define the typical user of bath salts?
- 2) What routes of administration are used for bath salts?
- 3) What are the two most common synthetic cathinones found in bath salts?
- 4) What are some psychological symptoms of bath salts intoxication?
- 5) What are some physical symptoms of bath salts intoxication?
- 6) What are possible serious complications of bath salt intoxication?
- 7) How is bath salts intoxication treated?
- 8) What is the most important consideration for nurses with regards to BSA?

## Answers to Evaluation of Learning Questions

- 1) Age 20-29  
Male  
History of substance abuse  
History of psychiatric illness
- 2) IM/IV injection  
Insufflation  
Ingestion  
Rectal
- 3) Mephedrone  
MDPV
- 4) Delirium  
Hallucinations  
Paranoia  
Severe Agitation  
Combativeness  
Fear of nonexistent threats to self
- 5) Hyperthermia  
Hypertension  
Tachycardia  
Tachypnea  
Sweating  
Shortness of Breath  
Dry Mouth  
Nausea/Vomiting  
Chest Pains/Palpitations  
Headache
- 6) Cardiac injury  
Kidney injury  
Liver injury  
Compartment syndrome  
Necrotizing fasciitis  
DIC
- 7) Treatment is supportive  
Benzodiazepines are recommended for psychotic symptoms
- 8) The safety of self and staff!

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