Single Use Detergent Sacs (SUDS): An Emerging Threat or Novel Nuisance?

Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) Multi-Centre Study

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No conflicts of interest
Background

Extent of the Problem

Toxicity

Methods

Knowledge Transfer
Background
What’s the problem?

Detergent pods have poison-control world on edge

CARLY WEEKS
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ILLUSTRATIVE CASE

Diffuse Corneal Abrasion After Ocular Exposure to Laundry Detergent Pod

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Concentrated Liquid Detergent Pod Ingestion in Children

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Original Contribution

Airway compromise in children exposed to single-use laundry detergent pods: a poison center observational case series

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Pediatric Exposure to Laundry Detergent Pods

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WHAT’S KNOWN ON THIS SUBJECT: Case studies, abstracts, and small-sample research studies have shown that laundry detergent pods pose important poisoning risks to young children.

WHAT THIS STUDY ADDS: From 2012 through 2013, 17,230 children exposed to laundry detergent pods were reported to US poison control centers. Among children exposed, 4.4% were hospitalized and 7.5% experienced a moderate or major medical outcome, including 1 confirmed death.

KEY WORDS
detergent pod, ingestion, NPDS, poisoning, poison control center
Aspiration Ingestion Ocular Derm

Respiratory depression & arrest
Esophageal necrosis, burns and strictures
Conjunctivitis Keratitis
Irritation, burns & paresthesias

Decreased LOC
TIDE PODS

what's inside

POLYVINYL ALCOHOL
This stuff forms the film that holds the other ingredients in a jolly, candy-like form. (Unfortunately, hundreds of kids have attempted to eat laundry packs like these.) It's a water-soluble polymer related to Elmer's Glue. Pop it in the wash and it dissolves, releasing ingredients good-for-nothing into the wash water.

CROSS-HEADED POLYESTER
This polyester is cross-linked, which means it's very tough. It's the backbone of the encapsulated enzyme technology. It's like a hard rubber.

FATTY ACID SALTS
These make it into soap. It works by attaching its hydrophilic head to the grease or oil in a clothing stain, allowing both to be washed away with water.

ALCOHOLETHOXYSULFATE
Any of several linear amines are attached to the molecule binds to grease and dirt that's stuck to your clothes. The other binds to acceptors in the washing machine. Agitation helps lift the stain off the fabric to be broken down by the enzymes.

DISSODIC DISTYRYLBIPHENYL DISULFONATE
This absorb the ultraviolet light and emits it in the visible range, providing a faint blue glow that counteracts the natural yellowing of old clothes to make them look whiter and brighter.

MANNANASE
An enzyme that can break apart gum and starch. It's a thickener used in ice cream and salad dressing—and is fluids for hydraulic fracking—that can leave behind hard-to-remove stains.

TERMAMYL AND NATALASE
Two types of amylase, which are enzymes that attack starch-based stains like those from gravy and balsamic. Termamyl is the high-temperature variant, which makes the low. Together they get the job done in hot, warm, and cold water.

XYLOG-LUCANASE
This enzyme digests starch. It also produces the formation of little pills or hits on natural-fiber materials like cotton and linen. The idea is that the enzymes chew up the fine, hair-like strands sticking out of the clothing—a process "Tide cells" polishing" the fabric.

DIETHYLENE-TRIACETIC PACID SODIUM
This is a chemical—a molecule that latches onto metals. If your wash water is hard, it softens it, enabling the enzymes and surfactants to work more effectively. It also lifts stains from fabric that contain iron—like the blueberries—and keeps them from adhering to your duds.

CALCIUM FORMATE
Enzymes will digest each other over time or become denatured when exposed to heat. To help ensure they're still around when you need them, this substance is added to keep the enzymes "folded" until the pack is used. When it hits the wash, the calcium formate separates from the enzymes and leaves them free to attack your bespattered clothing.

SUITILLISIN
Face it—some clothing stains come directly from your filthy human body. This protein enzyme breaks down stains caused by left-behind keratin. Found mostly in the dead outer layer of skin cells, which contributes to the grime of a previous generation know as ring around the collar.
Where are the gaps?

No Canadian data exists
Primary Objective

Determine the incidence of SUDS exposure causing injury amongst the paediatric population (age 0-17 inclusive) in three tertiary paediatric hospitals from July 1 2009-July 1 2014
Secondary Objectives

1. To compare epidemiology and morbidity when examining exposure to SUDS and traditional (liquid/powder) detergent
2. To determine the type of exposure to SUDS and their prevalence
3. To determine the type of exposure that is associated with the highest morbidity
4. To examine factors associated with exposure, including brand, location of exposure, location of the product
Methods

Multicenter retrospective chart review

The Hospital for Sick Children (Toronto)

Stollery Children’s Hospital (Edmonton)

Alberta Children’s Hospital (Calgary)

Canadian Hospital Injury Reporting and Prevention Program (CHIRPP) Database study with supplementation of data from local electronic patient charts and PICU databases
Outcome Data

MILD: minimally bothersome, rapidly resolving

MODERATE: systemic in nature, treatment usually required but not life threatening

SEVERE: life threatening or result in severe disability
Knowledge Translation & Advocacy

- Engineering
- Education
- Enforcement
- Economics
Knowledge Translation & Advocacy

Education

Health Canada, Industry, Media, Parents
Knowledge Translation & Advocacy

**Engineering**

- Requiring SUDS containers to have a child-proof lid
- Wrapping individual SUDS in unappealing wrapper
Questions?