UNIVERSITY OF CALGARY

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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Presented by: Stephanie VandenBerg, MD CCFP-EM

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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
The Globe and Mail
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ILLUSTRATIVE CASE

Diffuse Corneal Abrasion After Ocular Exposure to Laundry Detergent Pod

Rachel E. Whitney, MD, Carl R. Baum, MD, and Paul L. Aronson, MD

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ILLUSTRATIVE CASE

Concentrated Liquid Detergent Pod Ingestion in Children

Natasha Sidhu, MD and Matthew W. Jaeger, MD

The American Journal of Emergency Medicine

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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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KEY WORDS

detergent pod, ingestion, NPDS, poisoning, poison control center

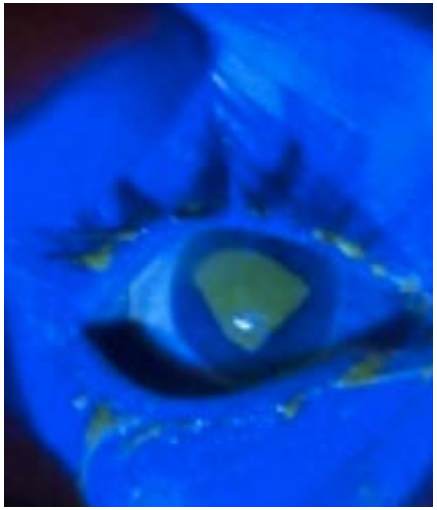
WHAT'S KNOWN ON THIS SUBJECT: Case studies, abstracts, and small-sample research studies have shown that laundry detergent pods pose important poisoning risks to young children.

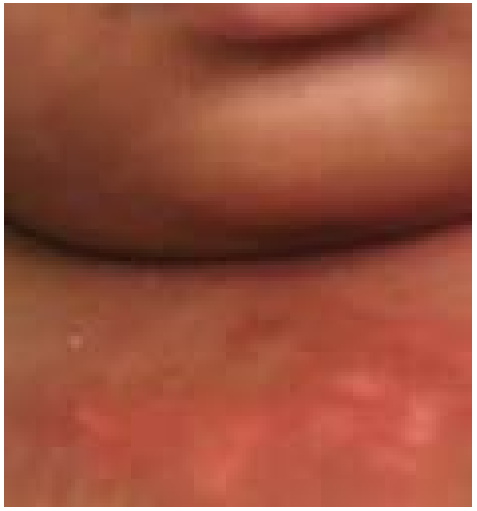
WHAT THIS STUDY ADDS: From 2012 through 2013, 17 230 children exposed to laundry detergent pods were reported to US poison control centers. Among children exposed, 4.4% were hospitalized and 7.5% experienced a moderate or major medical outcome, including 1 confirmed death.


Tide


Cascade
PLATINUM


Tide
PODS
Tide
PODS





Aspiration

Respiratory depression & arrest

Ingestion

Esophageal necrosis, burns and strictures

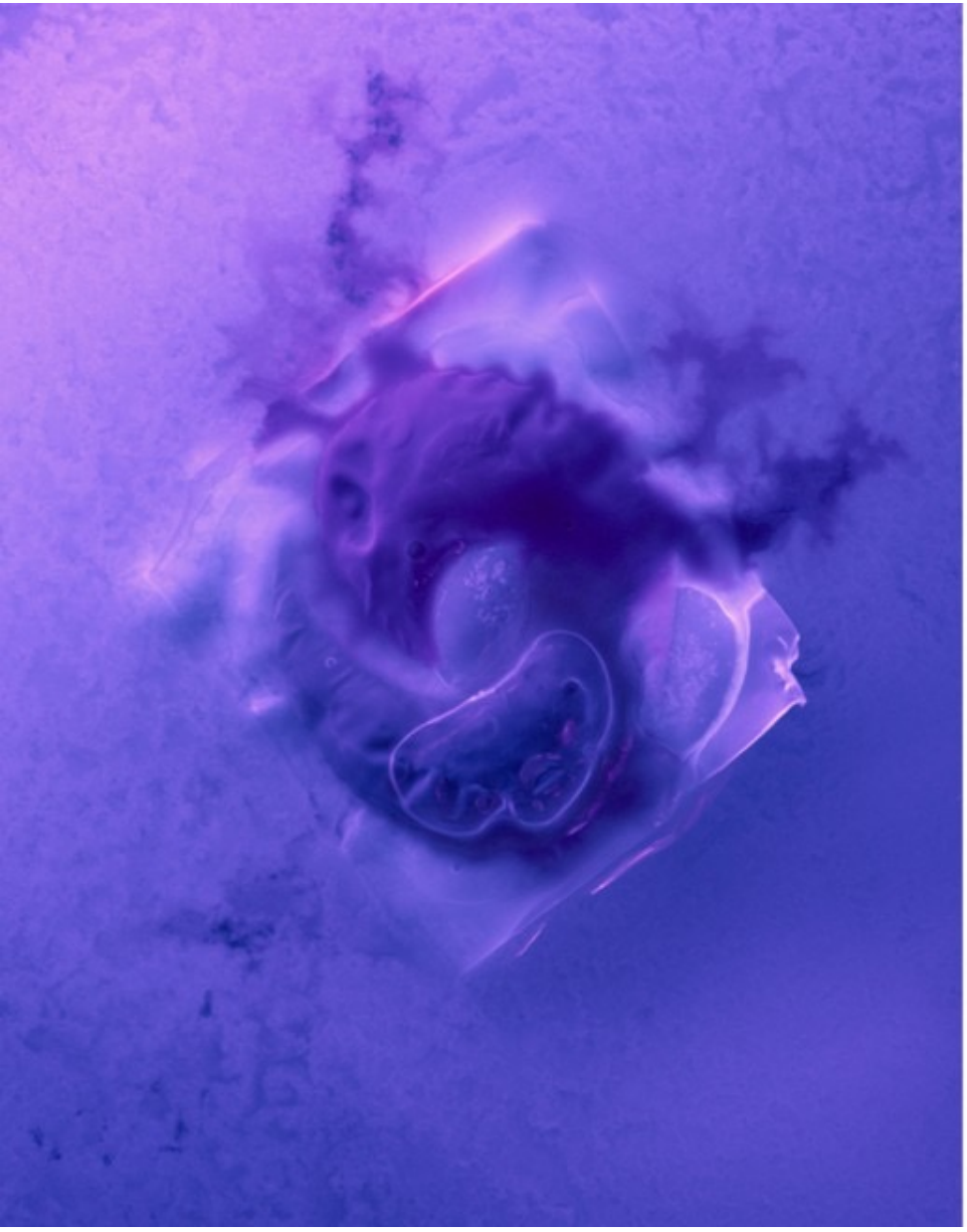
Ocular

Conjunctivitis
Keratitis

Derm

Irritation, burns & paresthesias

Decreased LOC



what's inside

TIDE PODS

Wash your clothes with fatty acid salts in a candylike package.

POLYVINYL ALCOHOL
This stuff forms the film that holds the other ingredients in a jolly, candylike form. (Reportedly, 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 detergenty goodness without any messy spills. Tide says its three-chambered design "maximizes the consumer experience," which probably means keeping the ingredients separated so that they don't neutralize each other while sitting on the shelf.

FATTY ACID SALTS
You may know it as soap. It works by attaching its hydrocarbon chain to the grease or oil in a clothing stain, allowing both to be washed away by water.

ALCOHOLETHOXY SULFATE
Any of several linear anionic surface acting agents. As with soap, one end of the molecule binds to grease and dirt that's stuck to your clothes; the other binds to water molecules in the washing machine. Agitation helps lift the stain off the fabric to be banished down the drain.

DISODIUM DISTYRYL-BIPHENYL DISULFONATE
DDD absorbs 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 guar gum, a thickener used in ice cream and salad dressing—and in 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 baby food. Termamyl is the high-temperature variant; natalase the low. Together they get the job done in hot, warm, and cold water.

XYLOGLUCANASE
This enzyme disintegrates the cellulose in plant cell walls. It also slows the formation of little pills or fuzz on natural-fiber materials like cotton and linen. The idea is that the enzyme chews up the fine, tendril-like strands sticking out of the clothing—a process Tide calls "polishing" the fabric.

SUBTILISIN
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 a previous generation knew as ring around the collar.

DIETHYLENETRIAMINE PENTAACETATE SODIUM
This is a chelant—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 that contain metal ions—like blueberries—and keeps them from re-adhering to your duds.

CALCIUM FORMATE
Enzymes will devour 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, leaving them free to assault your bespattered clothing.
—*Patrick Di Justo*

PHOTOGRAPH BY JONATHON KAMBOURIS

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

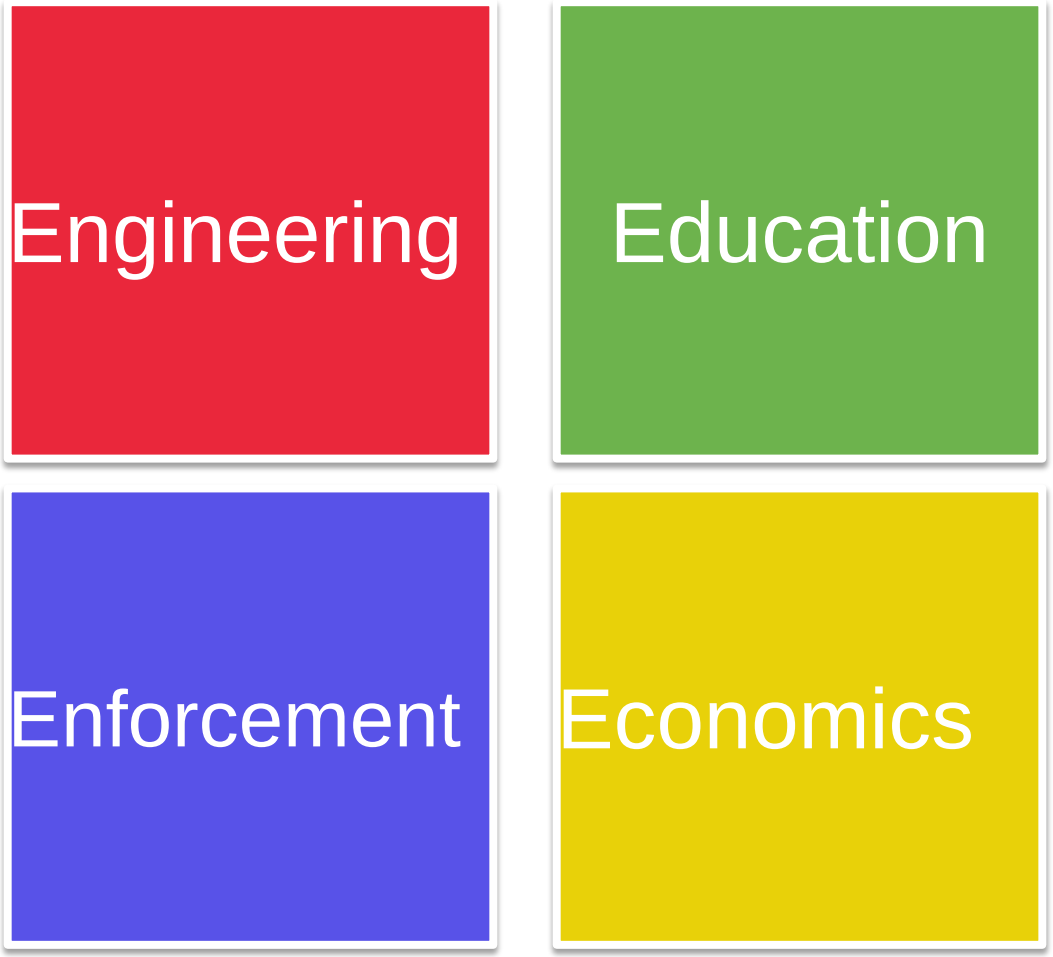
Outcome Data

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



Knowledge Translation & Advocacy

Education

Health Canada, Industry, Media, Parents

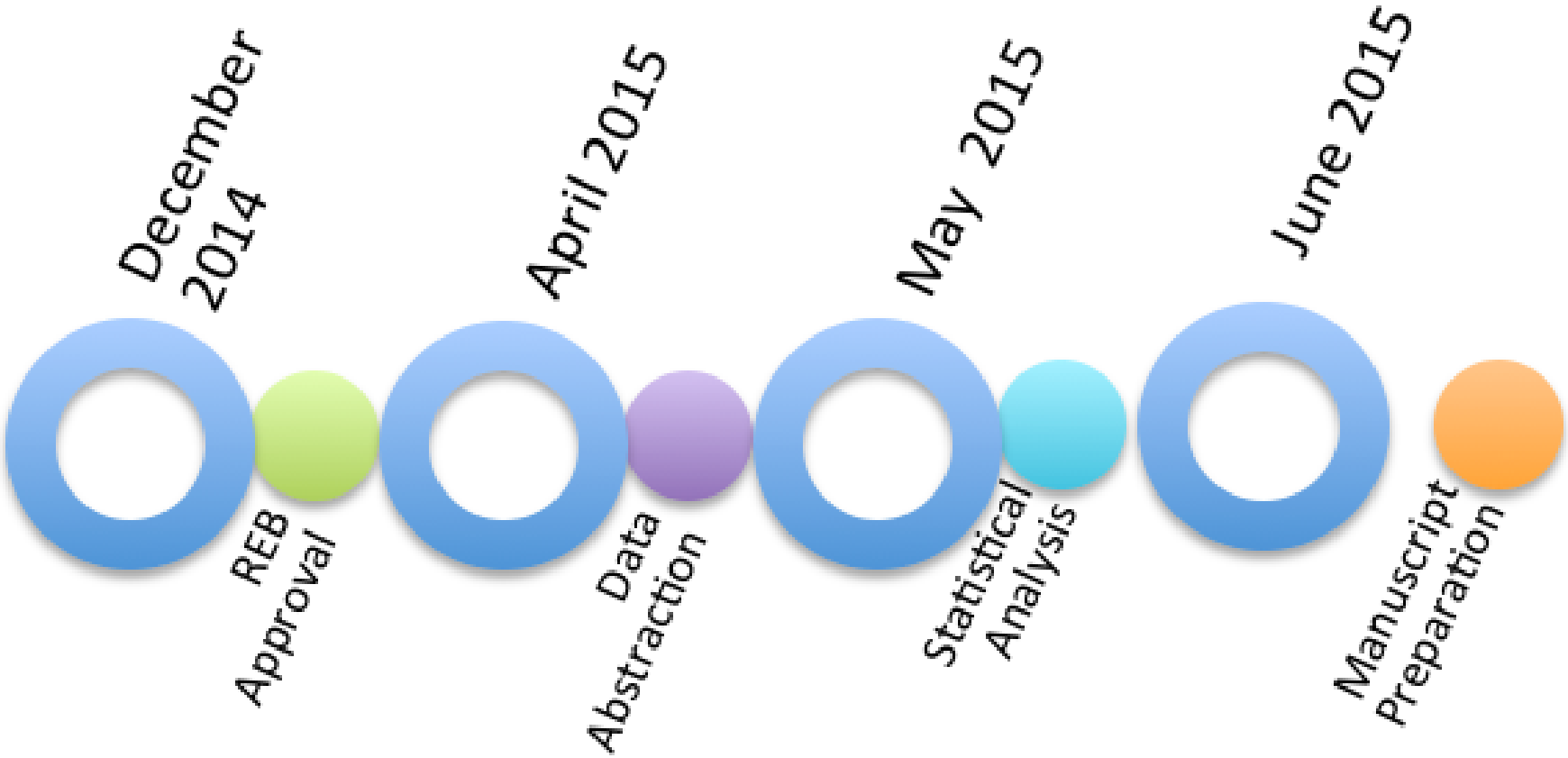
Knowledge Translation & Advocacy

Engineering

Requiring SUDS containers to have a child-proof lid

Wrapping individual SUDS in unappealing wrapper

Progress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May 2015
Statistical Analysis
June 2015
Manuscript Preparation

Questions?