

Building Scale (1)

The impact of buildings on health, well-being and productivity

Jan Stensland
Inside Matters



The background of the slide features a close-up of vibrant green leaves with prominent veins, overlaid with a semi-transparent white rounded rectangle. Below the leaves, the bottom portion of the slide shows a light blue-green water surface with gentle ripples. The text is centered within the white rectangle.


Evidence-based Design and the Development of Healthy Building Material Standards

Jan D. Stensland
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Green Material “Myths”

- ✿ “No one else is doing it.”
- ✿ “Only those Northern California nuts are doing it.”
- ✿ “C’mon, if it was that bad, the companies wouldn’t put it in their products.”
- ✿ “The products/materials are too hard to get.”
- ✿ “They aren’t durable.”
- ✿ “They cost more.”

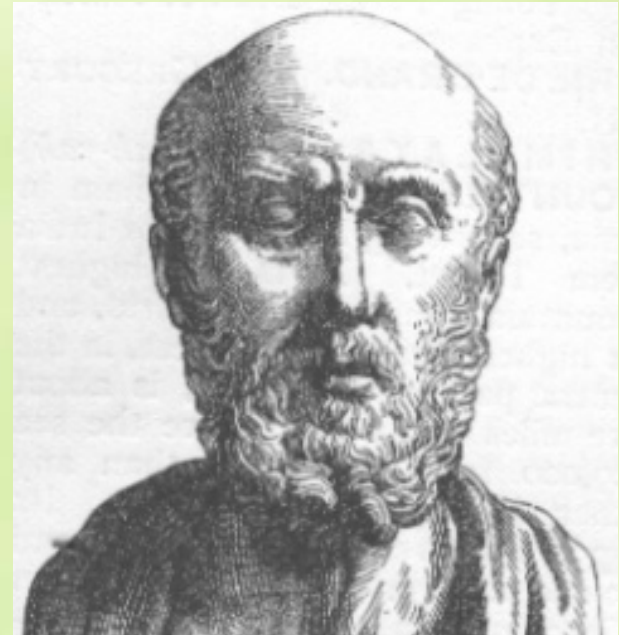


Objectives of This Talk

- ✿ Business Issues
- ✿ Health Impacts of Materials
- ✿ Key Criteria for Material Selection
- ✿ What's Worked
- ✿ What Needs Improvement

Hippocratic Oath

“First, do no harm.”



Evidence-Based Design Matrix for Healthcare

Outcomes	Single Patient	Patient Grouping	All Patients	Community	Staff	Organizational Culture	Family
Clinical							
Safety							
Economic							
Patient, family, staff based							
Sustainability							

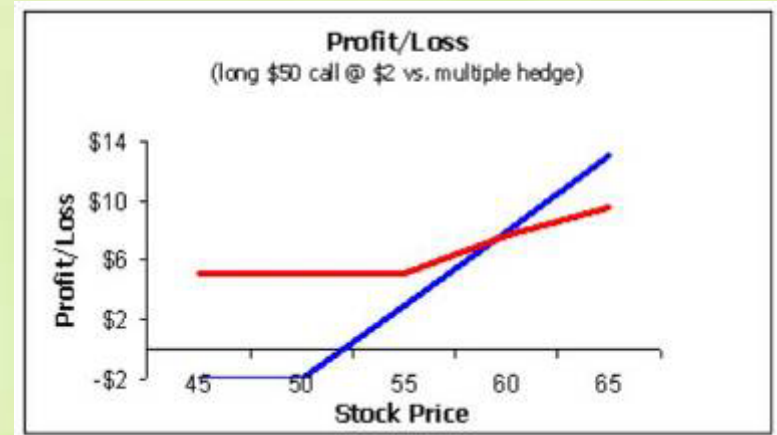


Materials Research Protocol

- ✿ Literature Review
- ✿ Product Review
- ✿ Specialist/expert Interviews
- ✿ Pilot Installations and Follow-up
- ✿ Analysis

Linking Health Issues and Healthcare Business Issues

- ✿ Respiratory Illness
- ✿ Slips/trips/falls
- ✿ Acoustics
- ✿ Mold
- ✿ Chemical and Particulate Exposures



Asthma in the Board Room

Why formaldehyde and phthalates are business issues



Annual Costs of Asthma

	2004
Indirect Costs	\$ 11.5 billion
Direct Costs	\$ 4.6 billion
Medications	\$ 5 billion
Annual Totals	\$ 20.1 billion

Slips/trips/falls: Shiny floors = more costs

- ✿ More chemicals
- ✿ More time for maintenance
- ✿ More costs for maintenance
- ✿ More noise for maintenance
- ✿ Patient perception issues
- ✿ Coefficient of friction & flooring



Acoustics

- ✿ NICU's
- ✿ Faster recovery times
- ✿ Personal experience



Mold

- ✿ Aspergillus niger & construction
- ✿ Unique solutions



University of Texas - Houston School of Nursing



Volatile Organic Compounds (VOCs)

- ✿ Formaldehyde

- ✿ Asthma, known carcinogen

- ✿ Naphthalene

- ✿ Anemia, possible carcinogen

- ✿ Styrene

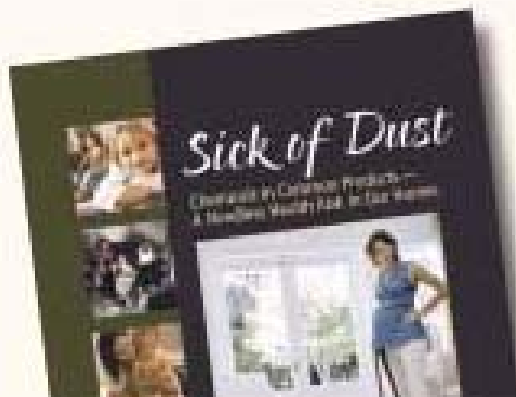
- ✿ Nervous system damage, possible carcinogen

- ✿ Toluene

- ✿ Nervous system and kidney damage

- ✿ *Hundreds* of other VOCs

- ✿ Endocrine disruption, liver damage, more.....



Sick of Dust

Chemicals in Common Products—
A Needless Health Risk in Our Homes

Pat Costner, Beverley Thorpe
& Alexandra McPherson

70 household dust samples - 10 states

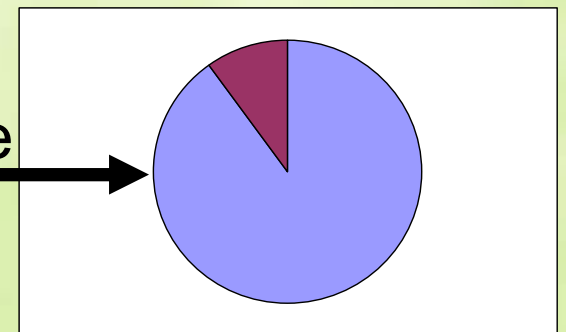
Phthalate plasticizers ubiquitous

Reproductive toxicant

asthma trigger



90% of phthalates are
used to soften PVC



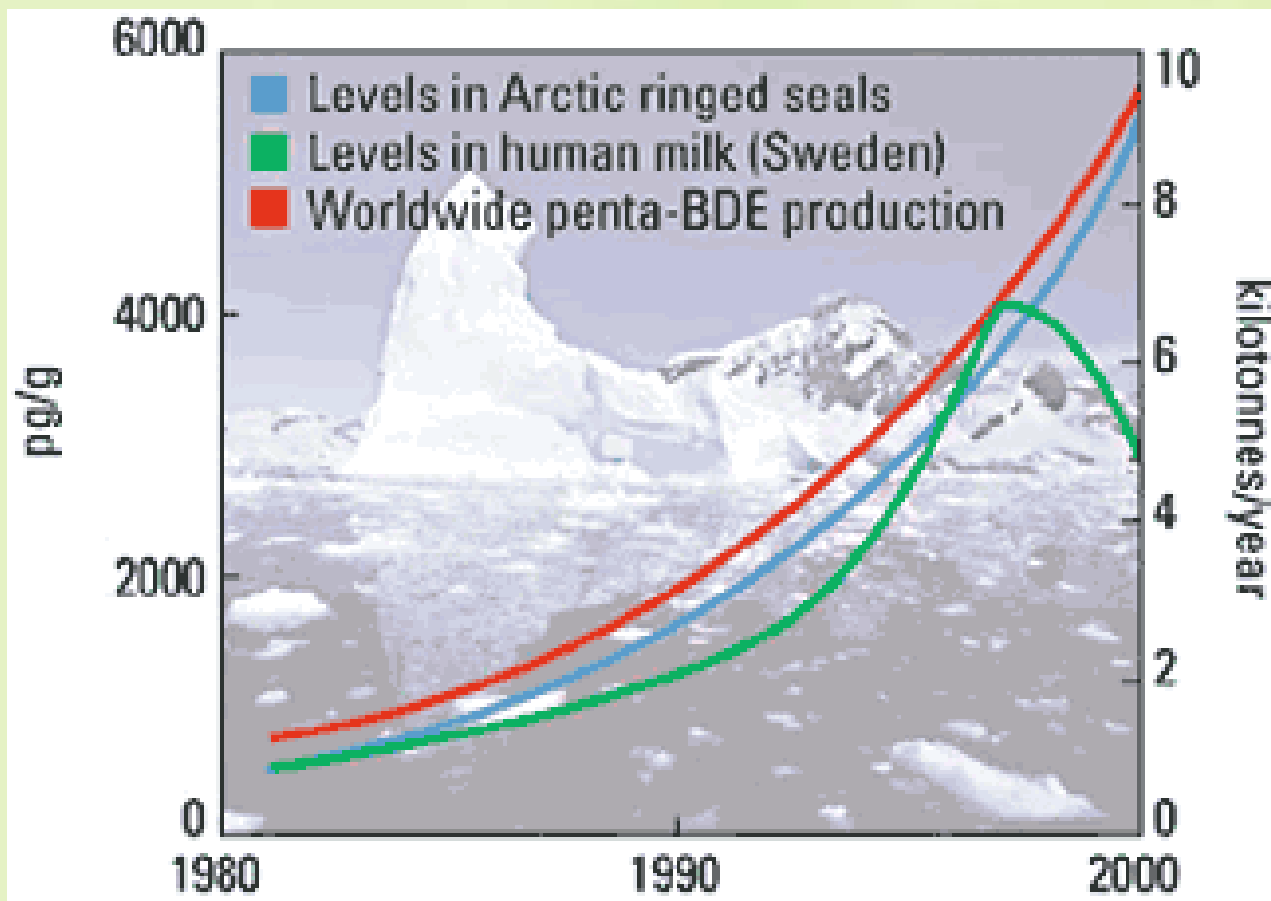
Green Production Action 2005

VOCs & Semi Volatile Organic Compounds (SVOCs)

- * **Phthalates** – Plasticizers in PVC
- * **Organotins** – Stabilizers in PVC & polyurethane foam
- * **Polybrominated Diphenyl Ether (PBDE)** – Brominated flame retardant (BFR) in foam, fabric, plastic
- * **Perfluorinated chemicals (PFCs)** – PFOA, Teflon, Scotchguard, Stainmaster, Zonyl
- * **Alkyphenols** – Cleaners, paints, paper, fiberglass & polyurethane, carriers for pesticides
- * **Pesticides**

Hormone disruption & cancer

Body burden





Four Key Criteria

- ✿ Do not use materials that contribute to the formation of **Persistent Organic Pollutants (POPs)**
- ✿ Do not use materials that **contain or emit highly hazardous chemicals**
- ✿ Use **sustainably sourced biobased or recycled and recyclable** materials
- ✿ Do not use materials **manufactured with highly hazardous chemicals**



PVC-free Resilient Flooring

Background Research

- ✿ 2 1/2 year study
- ✿ Committee of experts
- ✿ Studied variety of resilient flooring
- ✿ Manufacturers evaluation (product performance, healthcare product line, and environmental criteria)
- ✿ Pilot projects at several sites
- ✿ In-house testing for VOC's (volatile organic compounds) and staining
- ✿ Reference checks & site visits

What We Learned

Advantages of Rubber Flooring

- ✿ Better traction
- ✿ More comfort underfoot
- ✿ Better acoustics
- ✿ Better stain resistance
- ✿ Better infection control properties in OR's
- ✿ Better durability in OR's
- ✿ Better maintenance
- ✿ Faster patient room turn around

Business Case

Examples in Process or Completed

- ✿ PVC-free carpet backing
- ✿ PVC-free resilient flooring
- ✿ PVC-free wall and corner guards
- ✿ PVC-free cool roofing
- ✿ PVC-free upholstery fabrics
- ✿ HCHO-free particle board
- ✿ HCHO-free straw board
- ✿ HCHO and fiberglass free insulation
- ✿ Cadmium, lead, and mercury-free buildings
- ✿ No Halogenated Flame Retardants
- ✿ No or low VOC paint
- ✿ Sustainable electronics



Cost Implications of Healthy Materials

- ❖ Most alternatives are cost effective now.
- ❖ Some have paybacks over time.
- ❖ Some cost effectiveness perspectives are related to *health* issues.
- ❖ Exceptions if cost effectiveness not comparable to non-preferable products.



Modesto Medical Center

Examples of Valuation

- ✿ Finance - Return on Capital
- ✿ Design & Construction - Planning Commission
- ✿ Occupant Organization - image, vision, identity, brand, social responsibility, staff retention
- ✿ Public Realm - Civic pride, local health, neighborly behavior



Implementation Issues

- ✿ Staff health and safety
- ✿ Staff retention & recruitment
- ✿ Patient outcomes
- ✿ Maintenance realities
- ✿ Operational realities
- ✿ Rebates and donations
- ✿ Patient/customer satisfaction

Are we there yet?

✿ Iterative Process

✿ More research on materials

- ✿ Short term acute impacts (paint, etc.)
- ✿ Synergistic effects of chemicals
- ✿ Long term emissions
- ✿ Semi-volatile organic compounds

✿ Knowledge Management

- ✿ Information gathering tools
- ✿ Turning information into action
- ✿ Organizational learning
- ✿ Industry learning



Thank you!