

健康醫院管理的新紀元
***A New Era of Healthier Hospital Management:
The Sustainable Hospital
Good for Patients, Providers, and Their Communities***

健康照護與環境友善國際研討會（議程草案）

**The 2010 International Conference
Healthy Hospitals & Healthy Environment
Health Care in the Climate Change Era**

October 23, 2010

**Peter Orris, MD, MPH, FACP, FACOEM
Professor and Chief of Service
Occupational and Environmental Medicine
University of Illinois at Chicago Medical Center
Chair
Health Care Without Harm Research Collaborative**



World Health Organization Collaborating Center



Health Care Industry

- **World Wide:**

- 100,000,000 Health Care Workers
- 3% of Gross Domestic Product in 1948
- 7.9% of GDP in 1997
- Range 2% - Somalia to >14% - US



WHO, World Health Report, 2000

Health Care and the Environment: Global Trends

Environmental Impact of Health Care

Waste Management

Volume

Incineration

Sustainable Purchasing

PVC

Mercury

Safe Injections

Indoor Environment

Healthy Food

Institutional Design

Climate Impact



The 3 Safeties

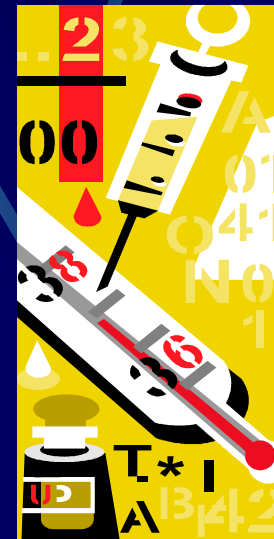
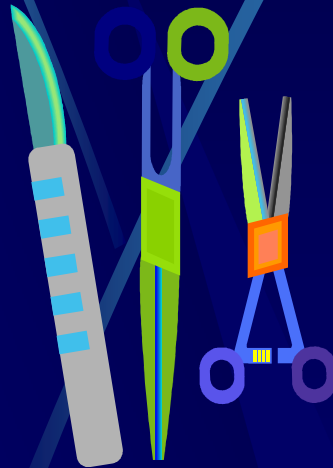
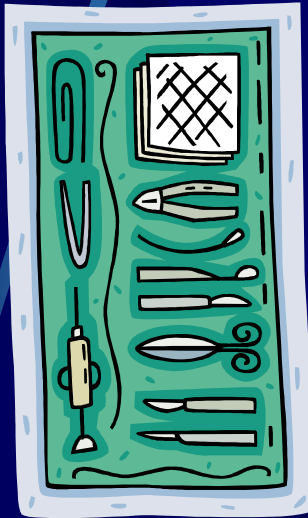
Patient – Worker - Community

INCREASING VOLUME

- Large amounts of single-use, disposable items
- Recycling not being utilized in many cases



Single Use Devices

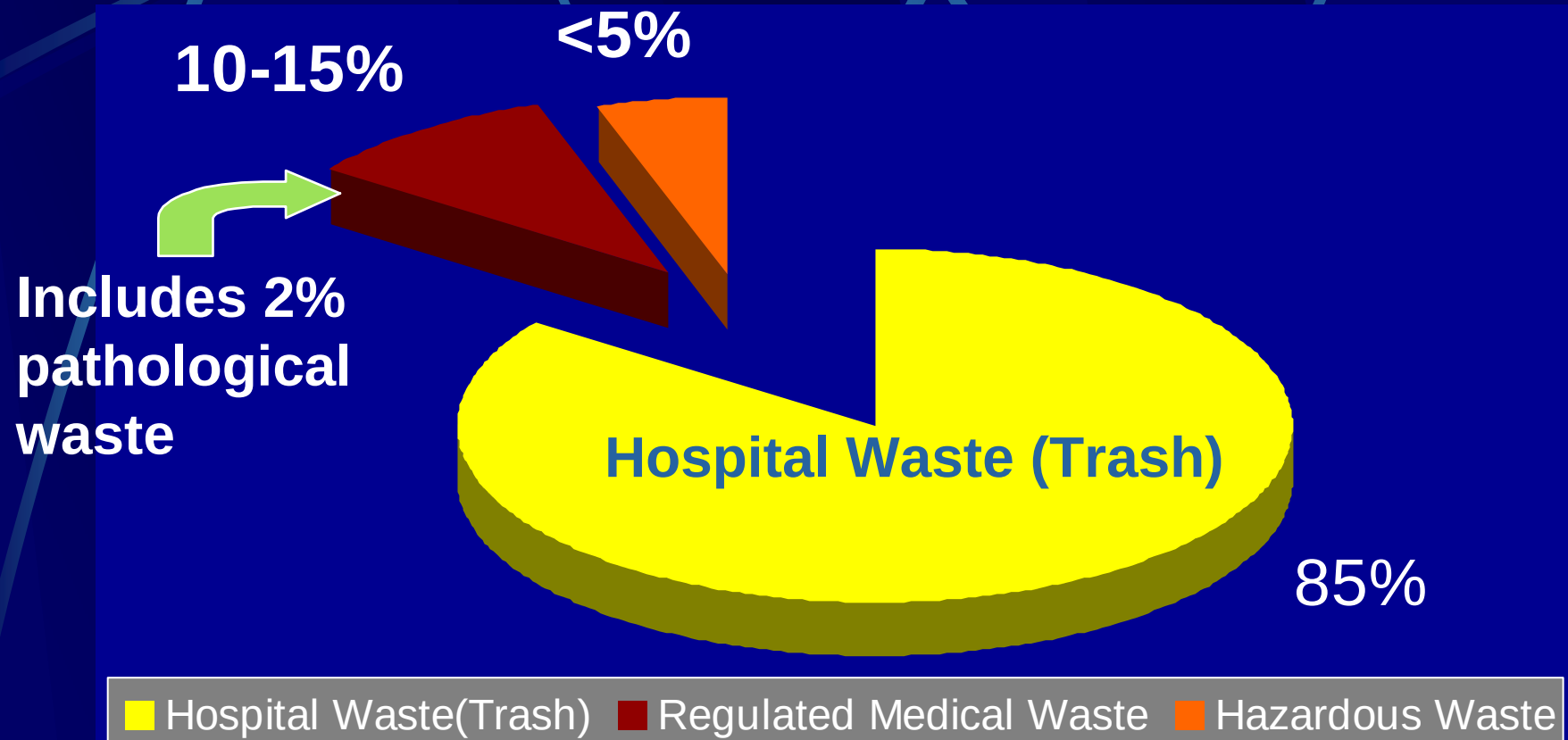


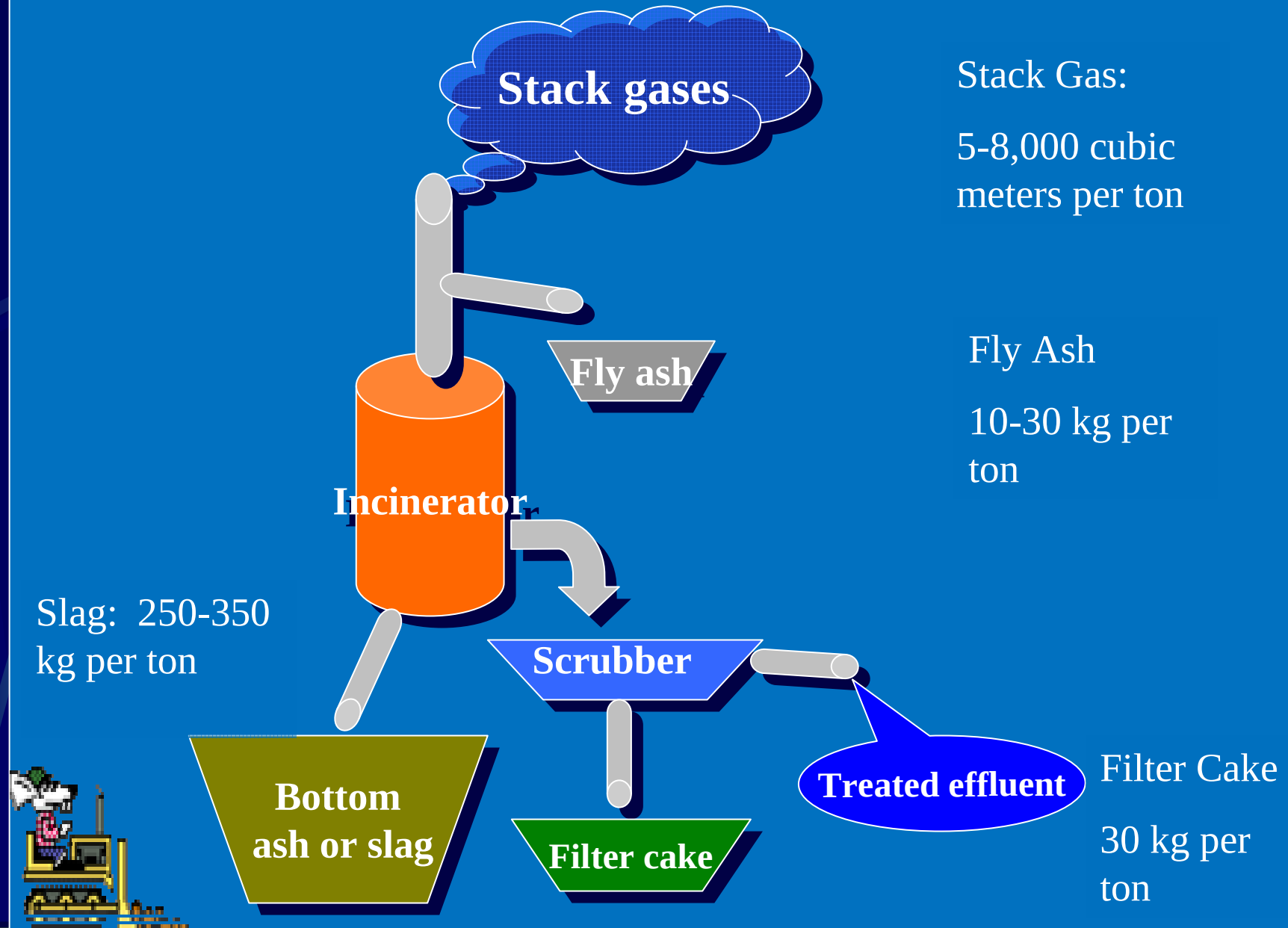






Most Hospital Waste Is Simply “Trash”





Source: unk

MOST WIDELY KNOWN INCINERATOR POLLUTANTS OF CONCERN

- DIOXINS
- PARTICULATE MATTER
- ARSENIC
- BERYLLIUM
- CADMIUM
- CHROMIUM
- LEAD
- MERCURY
- ACIDIC GASES

Source: National Research Council, 2000. Waste Incineration and Public Health, Washington, DC: National Academy Press

Chicago Tribune

● September 29, 2004

Gottlieb Hospital Sued Over Burning

By Michael Hawthorne
Tribune staff reporter

Emissions of cancer-causing dioxins from a Melrose Park hospital incinerator were more than 100 times higher than allowed by law, according to a lawsuit filed Tuesday by Illinois Atty. Gen. Lisa Madigan.



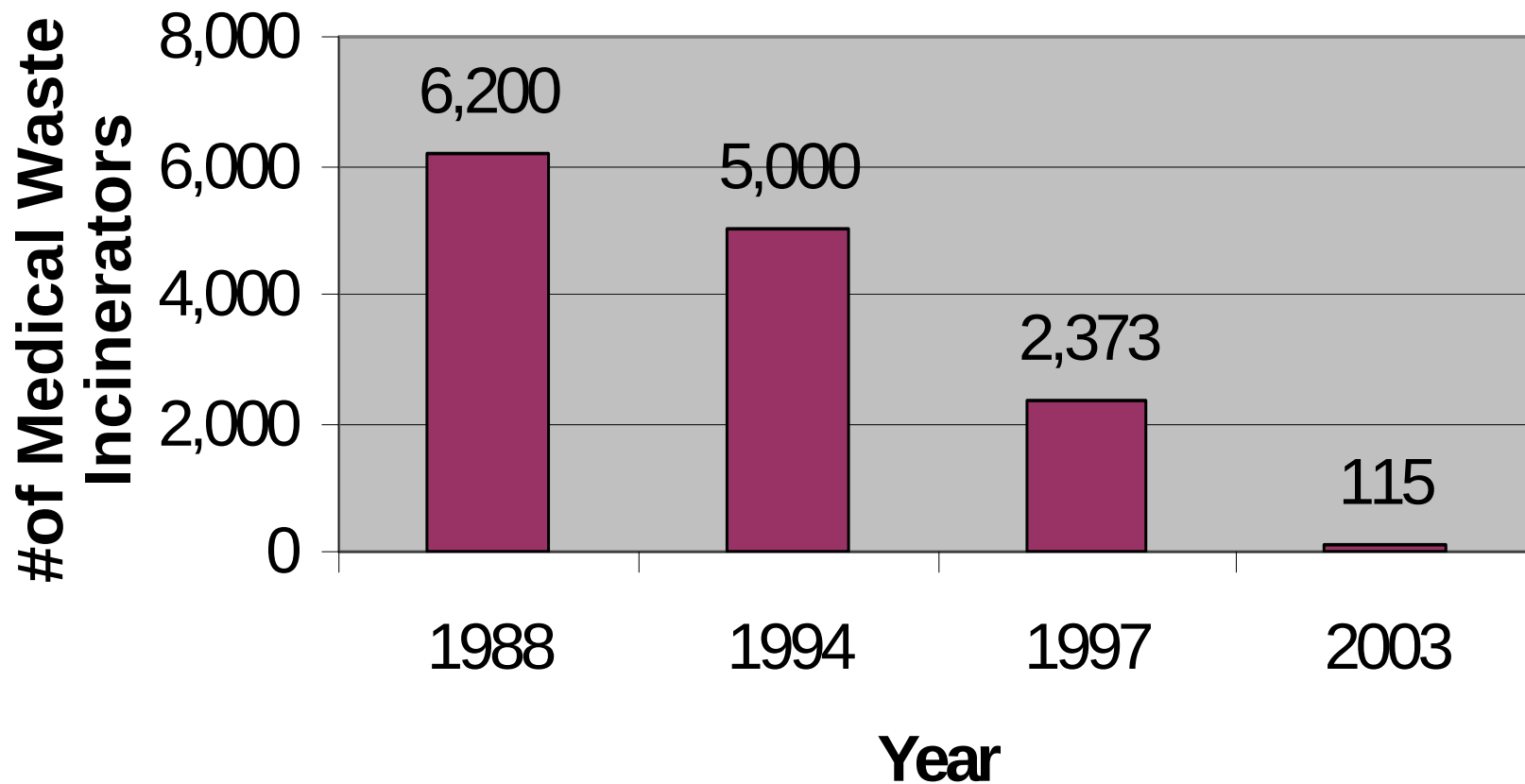
Cost Comparison (100 lb/hr)

Cost Item	Incinerator*	Autoclave**
Base equipment cost	150,000	70,000
Installation cost	22,500	6,500
Cost of pollution control technology to meet EPA emission limits for a 50 lb/hr incinerator	194,500	0
Cost of electric steam generator	0	16,000
Cost for monitoring and testing	16,600	2,400
TOTAL	\$383,600	\$93,100

*** US EPA estimate of annual operating cost for the air pollution control device = \$60,446 per year**

**** Based on San-I-Pak**

US Trends

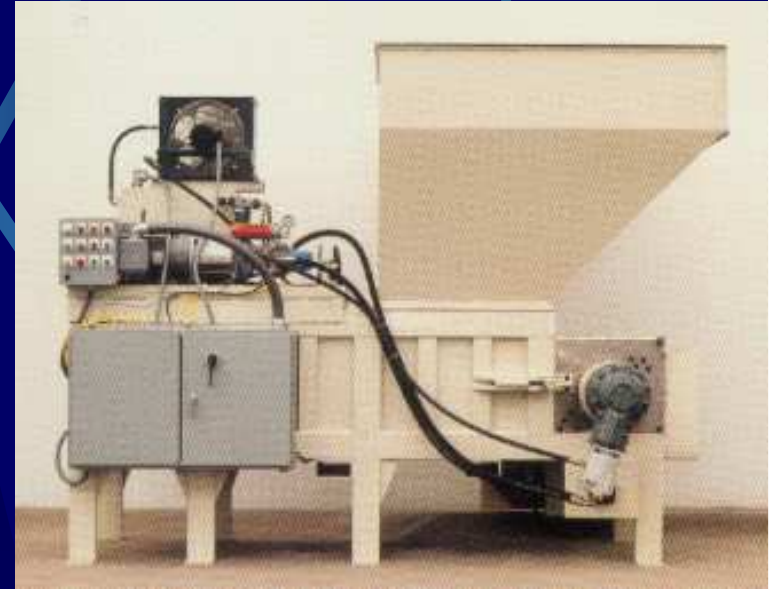


[1] "Hospital Waste Combustion Study-Data Gathering Phase," US EPA, December 1988; "Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Medical Waste Incinerators," US EPA, January 1996; "Status of Current HMIWI Efforts," Fred Porter, US EPA, presented at the Medical Waste Institute, June 2003.

Autoclave Example



Autoclave With Safety Interlocks on the
Door



Shredder/Grinder Unit

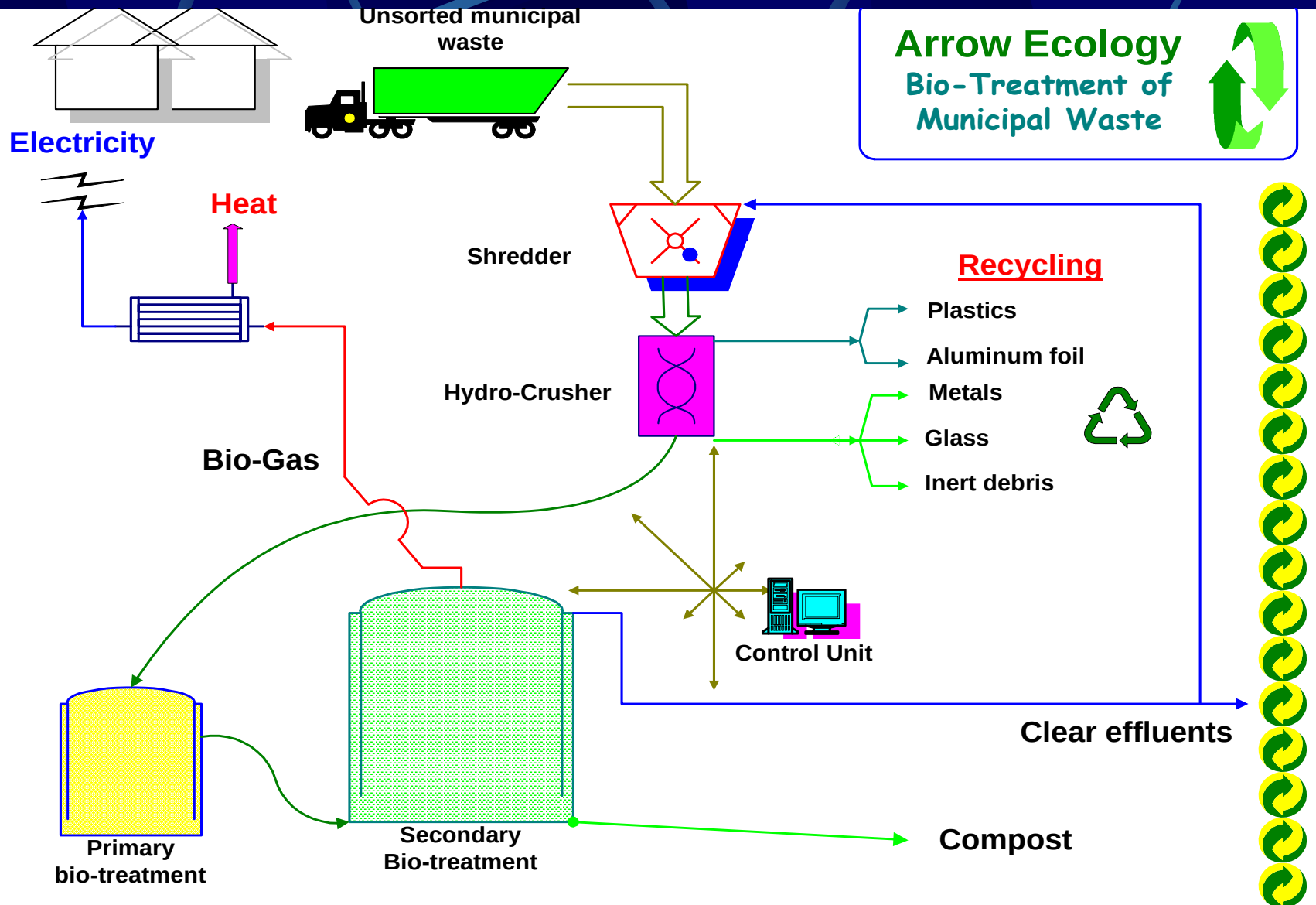
Process:

- Steam treatment**
- Shredding**
- Compaction**

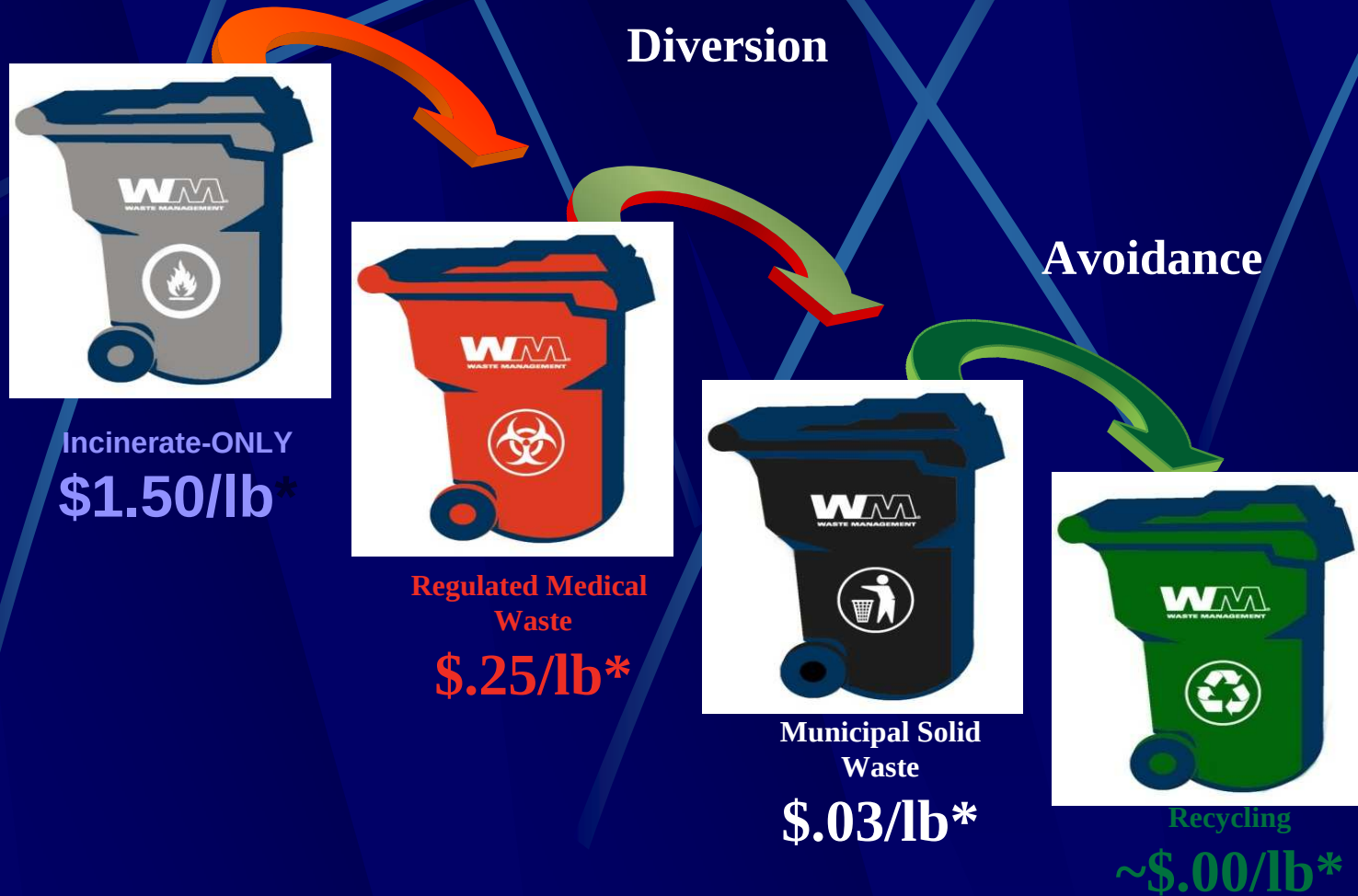
**Range of capacities: 200 -
750 lbs/hr**

Source: Sierra Industries, Santa Ana, California, USA

BioTreatment of Municipal Solid Waste



Reducing and Redirecting Waste is Key



*Amounts shown are hypothetical, only.

***The Sustainable
Alternative:***

***The ZERO WASTE 2020
Strategy***

San Francisco

- Population = 850,000
- Very little space
- 50% waste diverted by 2000
- 63% waste diverted by 2004
- 75% waste diverted by 2010 (goal)
- 100% (or very close!) by 2020 –
Zero Waste



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PVC in Medical Products

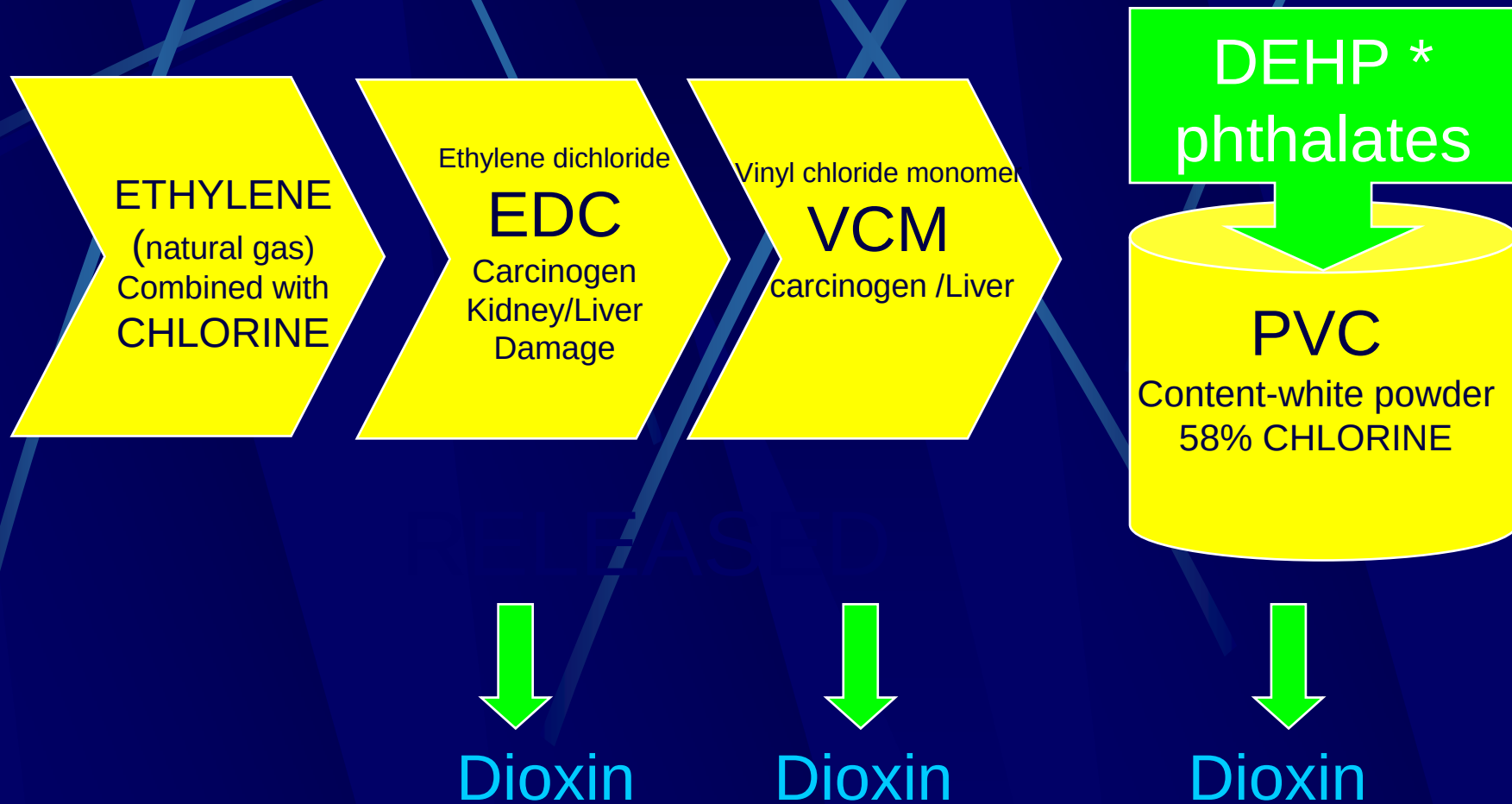
- IV bags
- Blood bags
- IV and respiratory therapy tubing
- Venodyne sleeves
- Patient ID cards
- Water bed liners
- Rigid packaging trays
- Mattress covers
- X-Ray folder holders
- Shower curtains
- Dialysis bags
- Thermal blankets

“serious concern” for the possibility of adverse effects on the developing reproductive tract of male infants exposed to very high levels of DEHP that might be associated with intensive medical procedures such as those used in critically ill infants...



National Toxicology Program Center for the Evaluation of Risks to Human Reproduction July, 2000

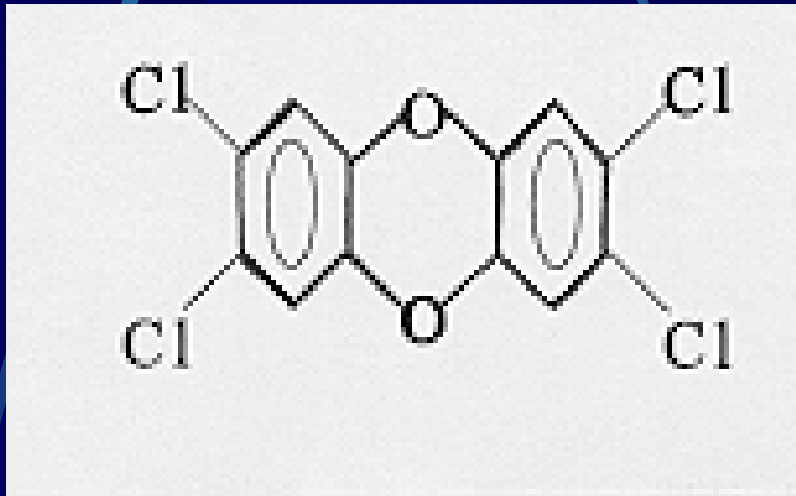
The PVC Life Cycle



* Di-2-ethylhexyl phthalate (DEHP) is used to make PVC flexible

Dioxin

2,3,7,8 tetrachlorodibenzo-para-dioxin (TCDD)



Most research is performed on TCDD because it has the greatest potency

- No commercial use
- Produced during production or destruction of chlorinated organic compounds
- 75 separate dioxin-like compounds

Viktor Yushchenko



TCDD

Human Health Effects of Dioxin

Cancer

- Known human carcinogen

Neonatal Abnormalities

- Change in sex ratio
- Altered level of thyroid hormone

Skin Disorders

- Porphyria cutanea tarda
- Chloracne

Neurologic Disorders

- Peripheral (animal)
- Central (PCB?)

Immune System

- Change in immune system parameters / modulation

Endocrine System Effects

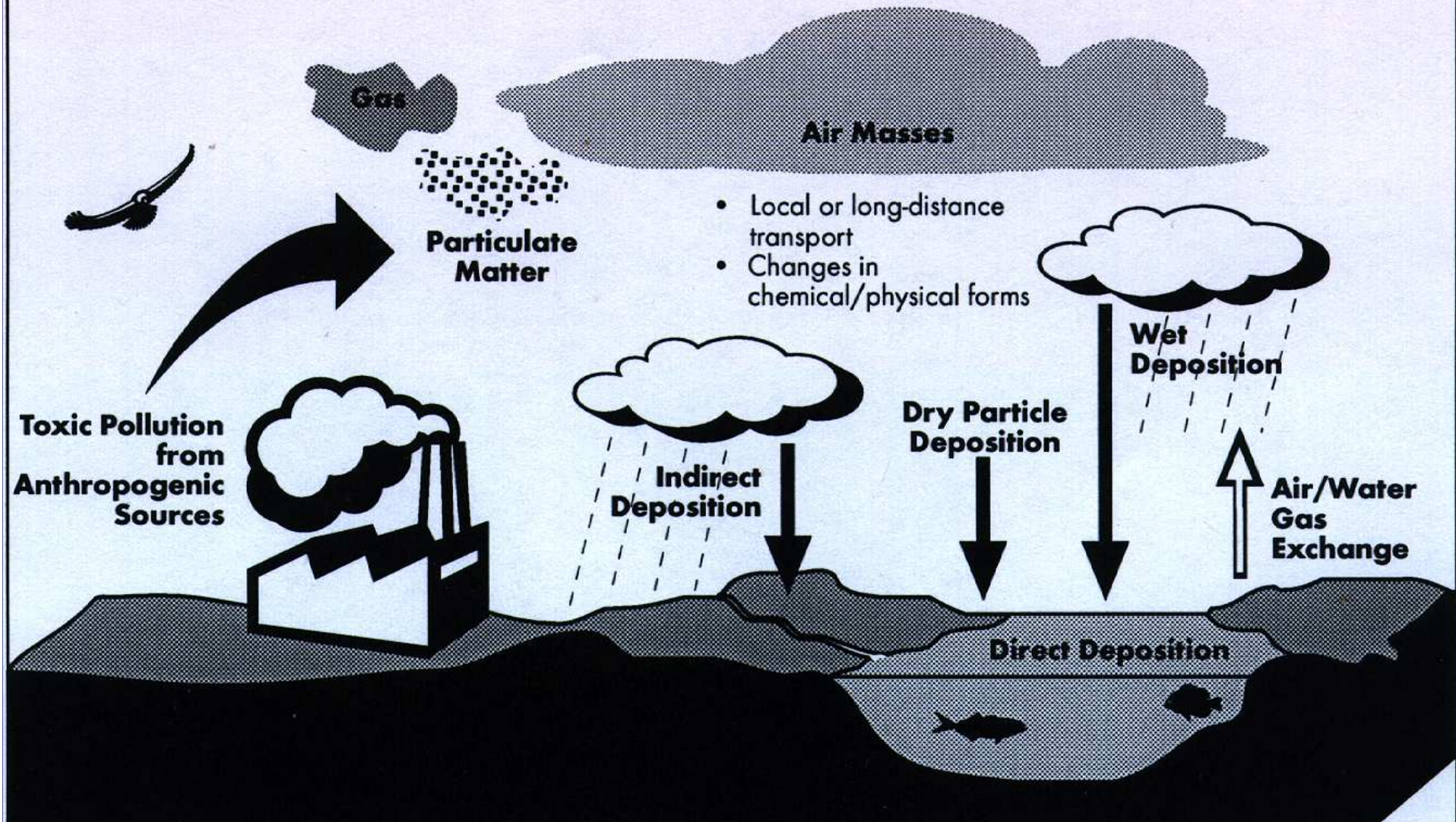
- Low levels of testosterone
- Increase glucose intolerance or diabetes
- Decreased estrogen & estrogen-receptor levels after fetal exposure

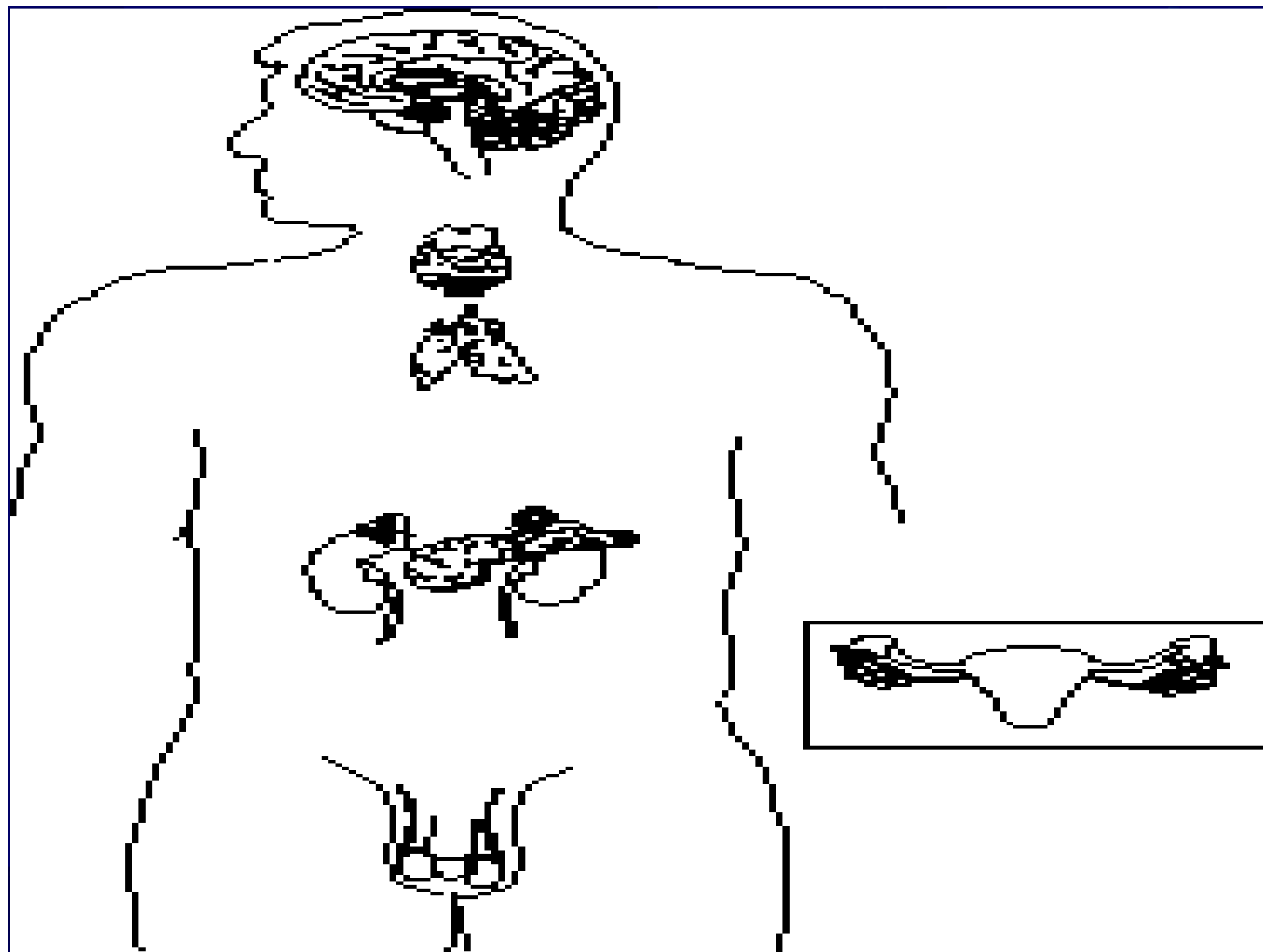
POPS

Chemicals which are persistent,
bioaccumulate and pose a risk of causing
adverse effects to human health and the
environment

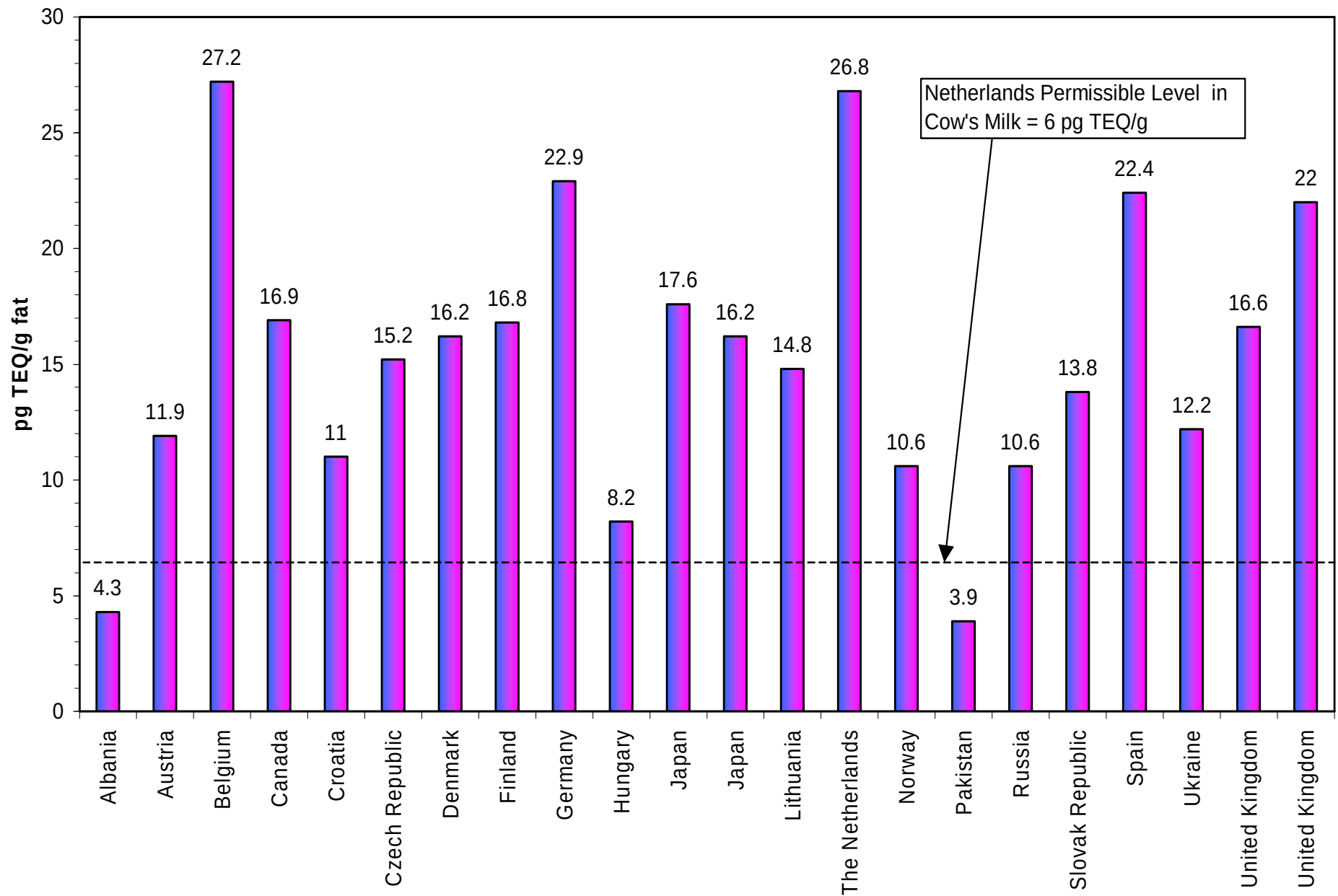


Persistent organic pollutants can be released into the environment, transported, and redeposited in water and on land far from their sources.





Dioxins in Breast Milk in Selected Countries



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Chemical Forms of Mercury

- Elemental

- Liquid metal



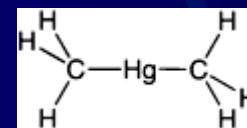
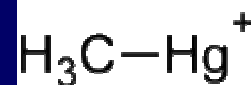
- Inorganic salts

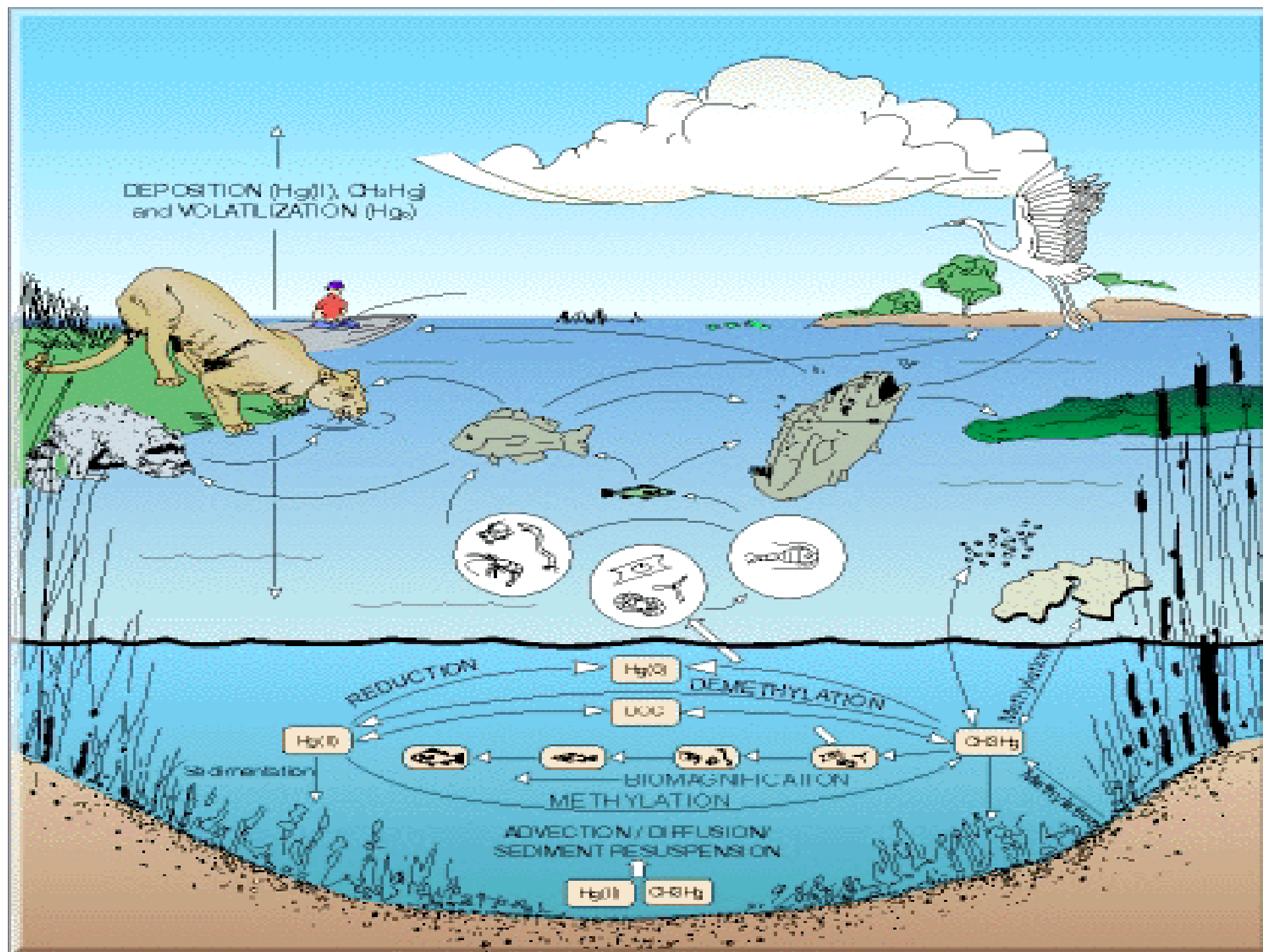
- Mercuric chloride



- Organic

- Methyl, ethyl, dimethyl
- Phenyl organic groups

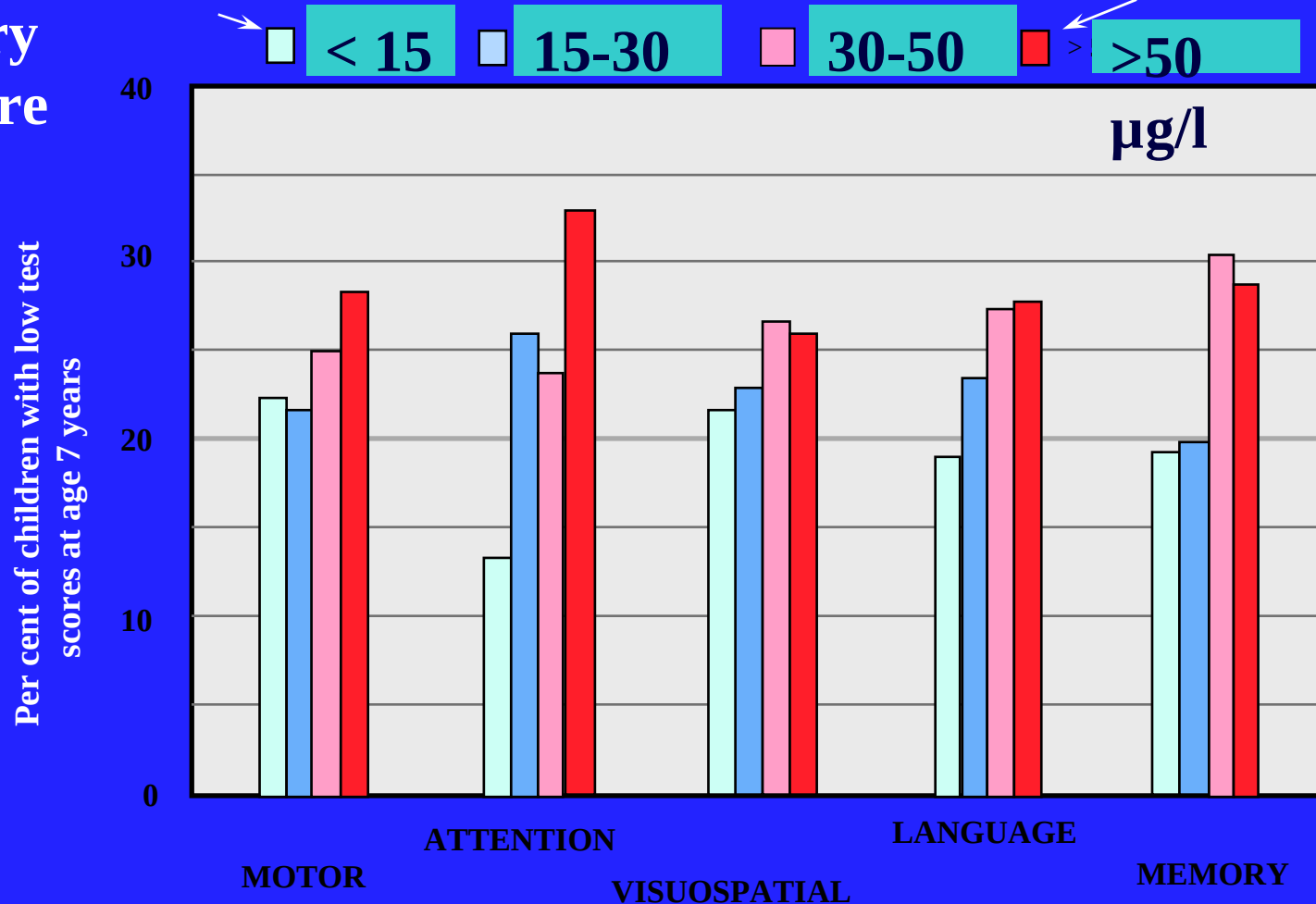




Mercury Effects of Low Dose Prenatal Exposure

Children with low prenatal
mercury
exposure

Children with high
prenatal
mercury
exposure



Source: Grandjean, et. al., "Cognitive Deficit in 7-year-Old Children with Prenatal Exposure to Methylmercury", Neurotoxicology and Teratology, Vol. 19, No. 6, 1997

Hg Exposure Potential from Seafood

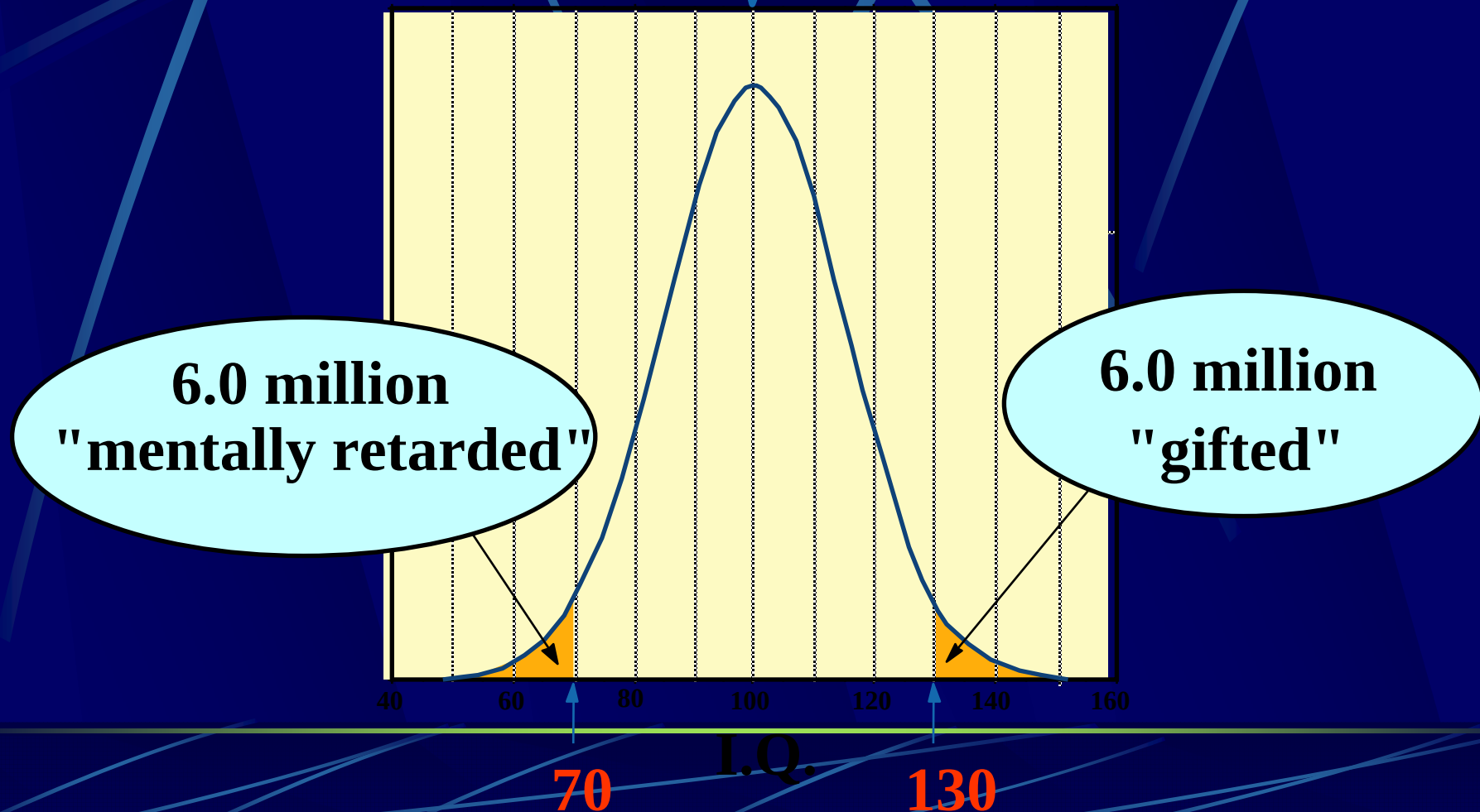
- Swordfish, shark $\geq$ 1 ppm
- Tuna steak about 0.3 – 0.5 ppm
- Canned tuna 0.1-0.3 ppm



The Significance of Small Effects:

EFFECTS OF A SMALL SHIFT IN IQ DISTRIBUTION IN A POPULATION OF 260 MILLION

mean 100



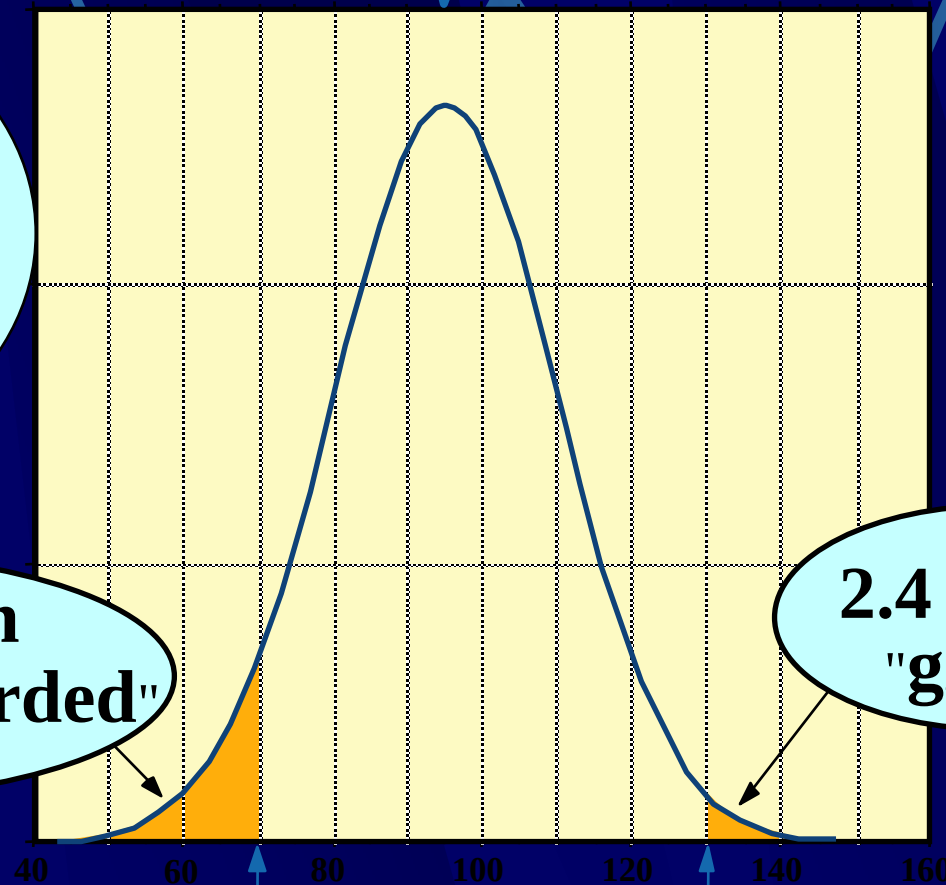
5 Point Decrease in Mean IQ

Mean 95

57% INCREASE
IN
"Mentally Retarded"
Population

9.4 million
"mentally retarded"

2.4 million
"gifted"



70

I.Q.

130

Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain

Leonardo Trasande, Philip J. Landrigan, and Clyde Schechter
Mount Sinai School of Medicine, New York, New York, USA

\$1.3 billion

each year is attributable to
mercury emissions from
American power plants.



GREAT LAKES **FISH** CONSUMPTION

ADVISORIES

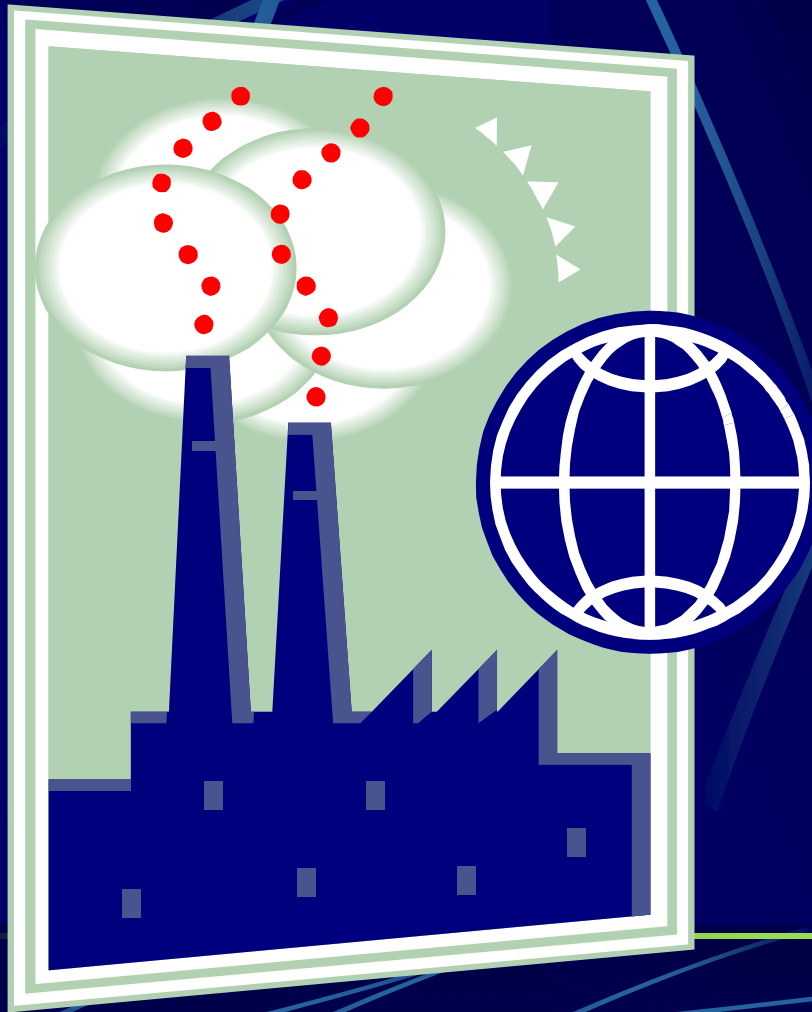


The Public Health Benefits and Risks

Discussion Paper prepared by the Health Professionals Task Force
for the International Joint Commission

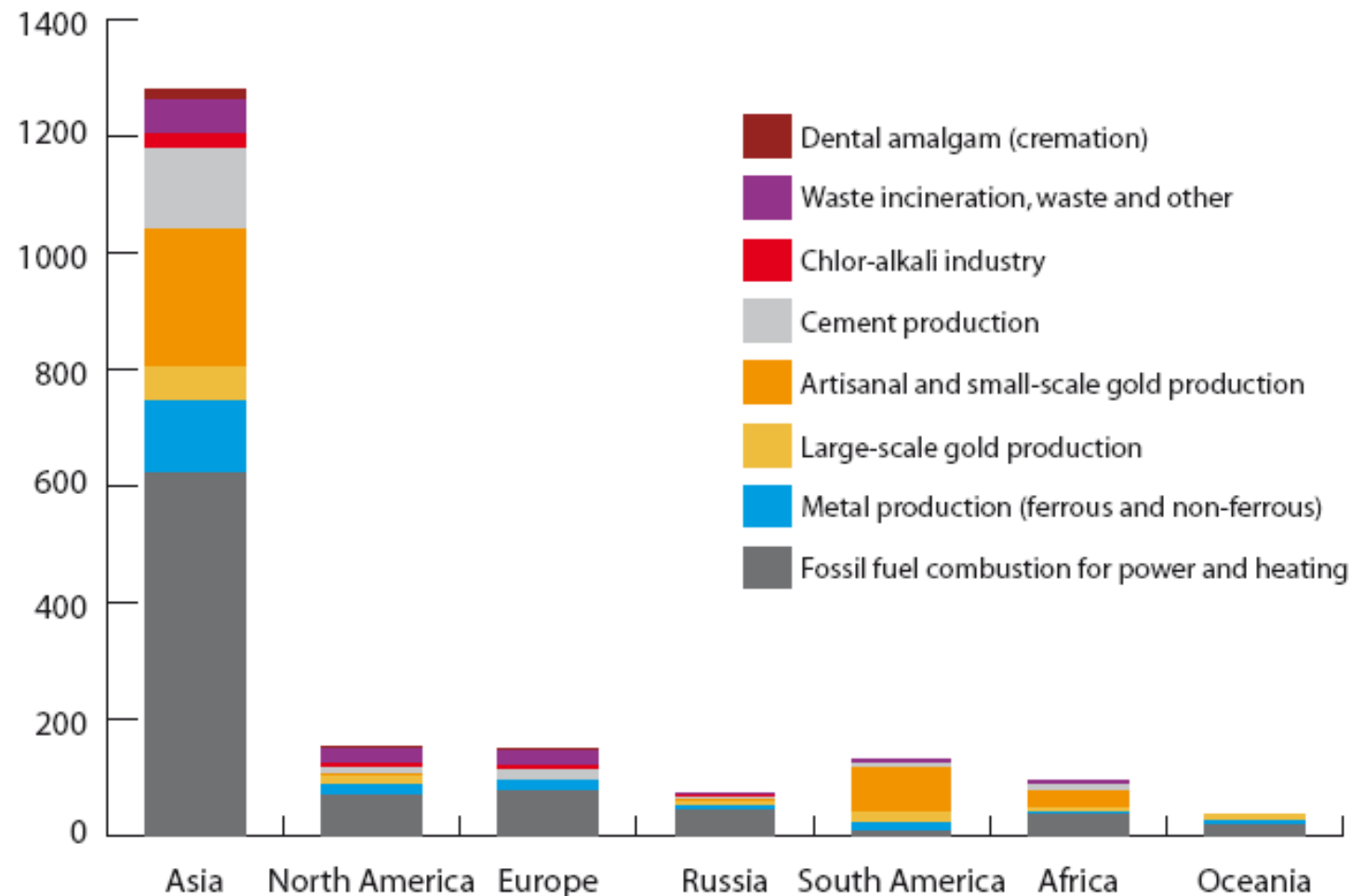
January 2004

Mercury Out Of The Fish Not Fish Out Of The Mother



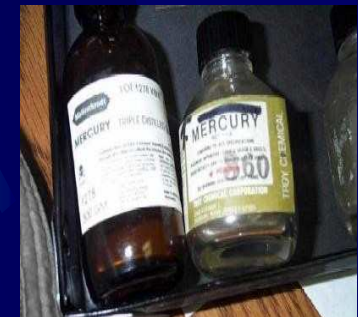
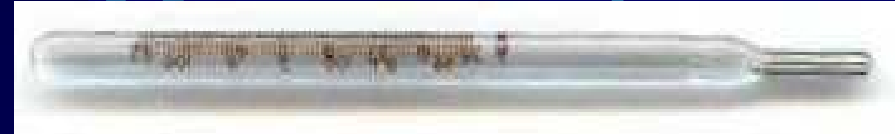
**Two-thirds
from Asian
sources
(mainly
China
and India)**

Mercury emissions, tonnes



Sources of mercury in health care

- Thermometers
- Sphygmomanometers
- Dental amalgam
- Gastrointestinal tubes
- Laboratory chemicals
- Pharmaceutical products
- Electrical applications
- Medical waste incineration, open burning, burning in barrels, gasification, pyrolysis, etc.





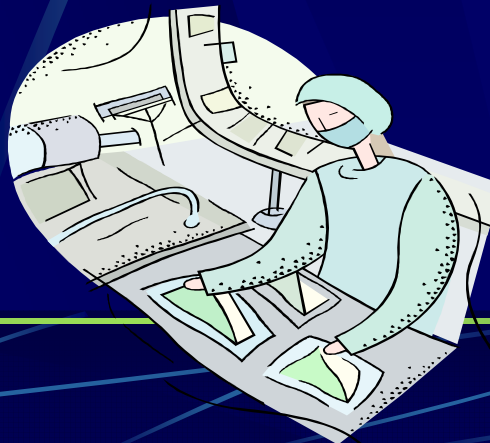
Thermometer Breakage

- A standard glass thermometer contains 1 gram of mercury
- Leaked mercury will evaporate and the mercury concentration in the air will be **22.2 mg/m³** in a 15 square meters large, three meter high room.
- China's provision of mercury maximum allowable concentration in indoor air is **0.01 mg / m³**. and in US workplaces the PEL is **0.1 mg/M³** & STEL is **0.03 mg/M³**.

Xueyu Li , Global village of Beijing: 12-20-2007

- Young Children have been poisoned after less than 2 weeks exposure to mercury vapor from a bedroom carpet after a single thermometer broke.

Poisindex, 2010





Don't take mercury lightly

MERCURY CONTAINMENT KIT

Should always be available in each ward

Gloves, face mask, eye shield, a syringe, two stiff pieces of cardboard, two plastic bags, packing tape, a flashlight and a container

IN CASE OF A MERCURY SPILL:

▲ DO NOT TOUCH THE MERCURY

Remove any jewellery/watch. Put on all protective gear. Use a flashlight to locate the mercury.

▲ COLLECT THE MERCURY CAREFULLY

Use cardboard sheets to push beads of mercury together. Use the syringe to suck the beads of mercury. Carefully place the mercury in a container with some water. Pick up any remaining beads of mercury with sticky tape and place contaminated tape in a plastic bag along with the syringe, cardboard, and gloves. Label the bag as mercury waste. Place this bag and sealed container in the second bag. Label it as mercury waste.

▲ NEVER USE A VACUUM CLEANER OR BROOM

▲ DISPOSE THE MERCURY PROPERLY

The collected mercury is hazardous waste and should either be disposed off at a hazardous waste facility or given to a mercury equipment manufacturer.



Toxics Link
for a toxics-free world

For more information on
mercury and its handling, please contact:

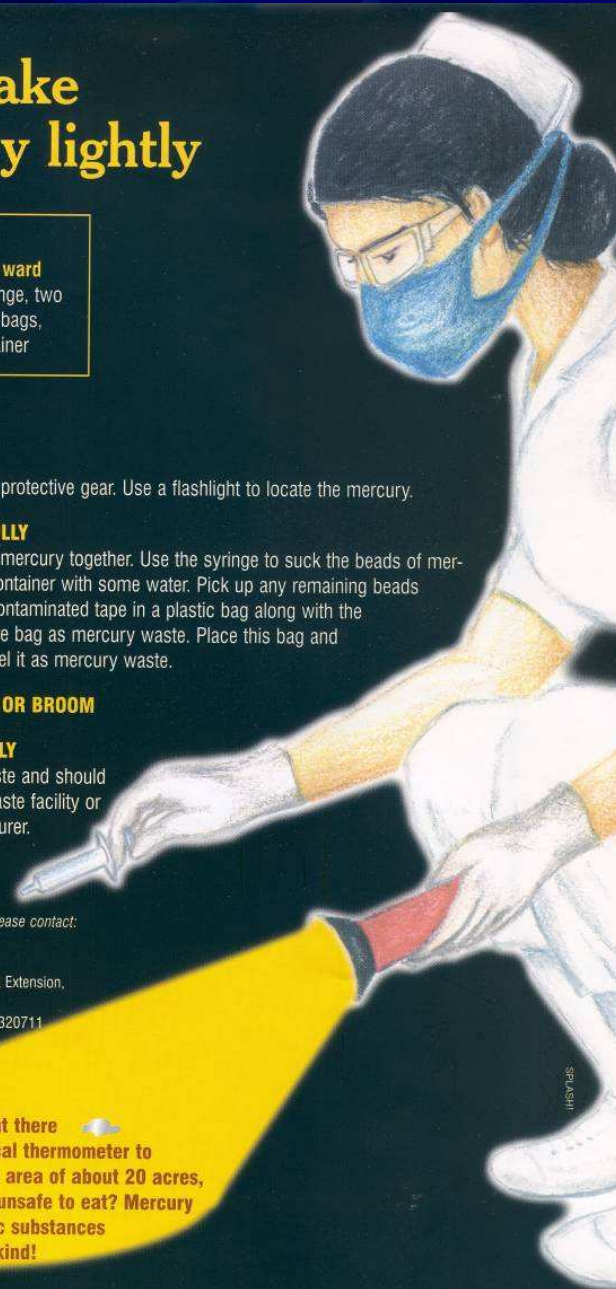
Ratna Singh,

Toxics Link - Delhi
H2 (Ground Floor), Jungpura Extension,
New Delhi 110 014.

T: +91-(0)11-24328006, 24320711

E: info@toxicslink.org

Did you know that there
is enough mercury in a typical thermometer to
contaminate a lake with a surface area of about 20 acres,
to the degree that fish would be unsafe to eat? Mercury
is one of the most toxic substances
known to mankind!







WORLD HEALTH ORGANIZATION

Mercury in Health Care

August 2005

POLICY PAPER

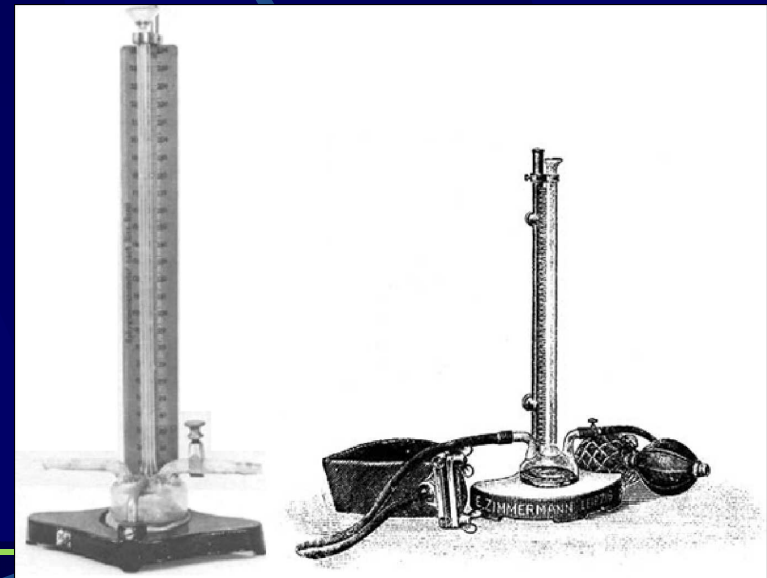
- The largest amount of mercury is used in mercury sphygmomanometers (80 to 100g/unit)
- The largest mercury reservoir in the health-care setting.



Recommendations for Blood Pressure Measurement in Humans

***American Heart Association Council on
High Blood Pressure Research***

It is surprising that nearly 100 years after it was first discovered, and the subsequent recognition of its limited accuracy, the Korotkoff technique for measuring blood pressure has continued to be used without any substantial improvement.



Gold Standard?

mm Hg = mm Hg

BP measurement with Hg = Accurate BP

??





“THE GOLD STANDARD”

- A survey of blood pressure devices used in a large teaching hospital in London in 2000 (n=469 devices)
 - 10% - the markings were difficult to read
 - 18% - either an obscured mercury column or faded markings,
 - 3 - were leaking mercury.
 - 8% - had “worn out”, damaged, or split cuffs
 - 35% - velcro cuffs did not stick well enough to resist bursting apart on inflation above 180 mmHg
 - 7 - cuffs contained the wrong size bladder for the size of the cuff.



“THE GOLD STANDARD”

- Electronic pressure gauges are more accurate and better for Y Tube calibration:
- Mercury sphygmomanometers
3 mm Hg variation
- Electronic pressure devices
0.005 mmHg variation

● Coleman AJ, 2005

Non Device Factors in BP Measurement Inaccuracy

The Health Care Provider

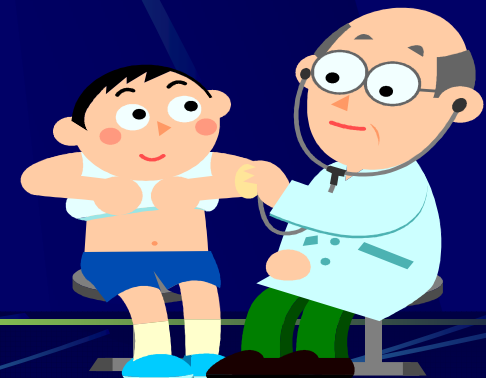


Table 4 Proposed values for correction of mean blood pressure (mmHg) to account for methodological differences of EPIC study centres compared with a standard procedure

EPIC Centre	Body position	Number of repeated measurements	Cuff size (cm)	Talking	Correction (without device) (mmHg)	Device
Standard	Seated	2	12 × 23	No	SBP: 0 DBP: 0	Mercury manometer
Denmark,	SBP: ± 0	SBP: −5.8	SBP: ≈ ± 0 to +7	SBP: ± 0	SBP: −5.8 to +1.2	SBP: −0.9 to +1.4
Aarhus	DBP: +2 to +8	DBP: −1.9	DBP: ≈ ± 0 to +3.5	DBP: ± 0	DBP: +0.1 to +9.6	DBP: −0.6 to +1.3
Denmark,	SBP: ± 0	SBP: −5.8	SBP: ≈ ± 0 to +7	SBP: ± 0	SBP: −5.8 to +1.2	SBP: −0.9 to +1.4
Copenhagen	DBP: +2 to +8	DBP: −1.9	DBP: ≈ ± 0 to +3.5	DBP: ± 0	DBP: +0.1 to +9.6	DBP: −0.6 to +1.3
England,	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: −13.2 to +3.1
Cambridge	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: −17.4 to −3.3
England,	SBP: ± 0	SBP: ± 0	SBP: ≈ +4 to +7	SBP: ± 0	SBP: ≈ +4 to +7	SBP: −0.9 to +1.4
Oxford	DBP: ± 0	DBP: ± 0	DBP: ≈ +2.5 to +3.5	DBP: ± 0	DBP: ≈ +2.5 to +3.5	DBP: −0.6 to +1.3
France	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: −0.9 to +1.4
	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: −0.6 to +1.3
Germany,	SBP: ± 0	SBP: ± 0	SBP: ≈ +4 to +7	SBP: ± 0	SBP: ≈ +4 to +7	SBP: ± 0
Potsdam	DBP: ± 0	DBP: ± 0	DBP: ≈ +2.5 to +3.5	DBP: ± 0	DBP: ≈ +2.5 to +3.5	DBP: +0.5
Greece,	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0
Athens	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0
Italy,	SBP: ± 0	SBP: ± 0	SBP: +7 ^a	SBP: ± 0	SBP: +7	SBP: ± 0
Florence	DBP: ± 0	DBP: ± 0	DBP: +3.5 ^a	DBP: ± 0	DBP: +3.5	DBP: ± 0
Italy,	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0
Milan	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0
Italy,	SBP: ± 0	SBP: ± 0	SBP: +7 ^a	SBP: −6.4 to −13.6	SBP: −6.6 to +0.6	SBP: ± 0
Ragusa	DBP: ± 0	DBP: ± 0	DBP: +3.5 ^a	DBP: −9.5 to −14.3	DBP: −10.8 to −6.6	DBP: ± 0
Netherlands,	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0	SBP: ± 0
RIVM	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0	DBP: ± 0
Netherlands,	SBP: ± 0	SBP: ± 0	SBP: +7 ^a	SBP: ± 0	SBP: +7	SBP: ± 0
Utrecht	DBP: ± 0	DBP: ± 0	DBP: +3.5 ^a	DBP: ± 0	DBP: +3.5	DBP: +0.5
Spain,	SBP: ± 0	SBP: ± 0	SBP: +7 ^a	SBP: ± 0	SBP: +7	SBP: ± 0
Granada	DBP: ± 0	DBP: ± 0	DBP: +3.5 ^a	DBP: ± 0	DBP: +3.5	DBP: +0.5
Spain,	SBP: ± 0	SBP: ± 0	SBP: +7 ^a	SBP: ± 0 to −13.6	SBP: −6.6 to +7	SBP: ± 0
Basque	DBP: ± 0	DBP: ± 0	DBP: +3.5 ^a	DBP: ± 0 to −14.3	DBP: −10.8 to +3.5	DBP: +0.5
Spain,	SBP: ± 0	SBP: ± 0	SBP: +7 ^a	SBP: ± 0 to −13.6	SBP: −6.6 to +7	SBP: −13.2 to +3.1
Murcia	DBP: ± 0	DBP: ± 0	DBP: +3.5 ^a	DBP: ± 0 to −14.3	DBP: −10.8 to +3.5	DBP: −17.4 to −3.3
Sweden,	SBP: ± 0	SBP: −5.8	SBP: ≈ +4 to +7	SBP: ± 0	SBP: −1.8 to +1.2	SBP: ± 0
Malmö	DBP: +2 to +8	DBP: −1.9	DBP: ≈ +2.5 to +3.5	DBP: ± 0	DBP: +2.6 to +9.6	DBP: ± 0

^aTentative estimate; an accurate value depends on the cuff size actually applied. SBP, systolic blood pressure; DBP, diastolic blood pressure (all mmHg).

End-digit preference in general practice:

a comparison of the conventional auscultatory and electronic oscillometric methods.

Burnier M, Gasser UE.

Service de Nephrologie et Consultation d'Hypertension, CHUV, Lausanne et Universite de Lausanne, and ClinResearch Ltd, Aesch, Switzerland.

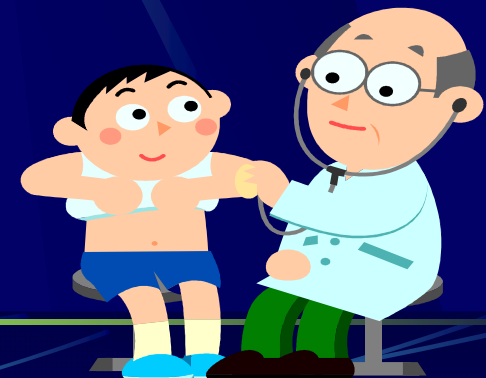
Very marked digit preferences were observed for both the conventional and the automatic measurements, being most prominent for the digit "0" (52% and 25%, respectively) followed by a preference for the digit "5" (19% and 15%).

Blood Press. 2008;17(2):104-9.



Non Device Factors in BP Measurement Inaccuracy

The Patient



Automated blood pressure measurement in routine clinical Practice

***Martin G. Myers
University of Toronto, Toronto,
Ontario, Canada***

Results:

- The mean initial automated reading (mmHg) taken with the observer present ($162 \pm 27/85 \pm 12$) was similar to the mean manual blood pressure taken in duplicate ($163 \pm 23/86 \pm 12$).
- Both values were higher ($P < 0.001$) than the mean of the next five readings taken with the automated recorder when the patient was resting quietly alone ($142 \pm 21/80 \pm 12$).
- Women exhibited a greater fall in blood pressure

Clinical Experience



Studies



Are Aneroid Sphygmomanometers Accurate in Hospital and Clinic Settings?

Vincent J. Canzanella, MD; Patricia L. Jensen, RN; Gary L. Schwartz, MD

Background: The aneroid sphygmomanometer is commonly used for the indirect measurement of blood pressure despite significant concerns about its accuracy. Although the mercury sphygmomanometer is highly accurate, there are concerns about the environmental toxicity of mercury. In response to various external pressures to become essentially mercury free, the Mayo Clinic, Rochester, Minn, has replaced many mercury sphygmomanometers with aneroid devices. Since 1993, a maintenance protocol has been in place to ensure proper function and accuracy of these devices.

Conclusion: Aneroid sphygmomanometers provide accurate pressure measurements when a proper maintenance protocol is followed.

2.0 Requirements for Aneroid Sphygmomanometers

Summary of requirements in ANSI/AAMI/ISO 81060-1:2007

Parameter	Summary of the Specification	Section
IDENTIFICATION AND MARKING		
Unit of measurement	mmHg or kPa	4.1
Legibility of markings	Should be clearly legible; see compliance test	4.2
Durability of markings	Should be sufficiently durable to remain clearly legible during the expected service life; see compliance test	4.3
Marking	Should include the name/trademark and address of manufacturer, model, serial or batch number if appropriate, proper disposal, etc.	4.4
Usability of reading	Should have an indication when the reading error due to parallax exceeds ± 2 mmHg (0.3 kPa)	4.5
Cuff marking	Should indicate the correct positioning and appropriate limb circumference	4.6
Marking on the packaging	Should include contents, special storage or handling if any, intended use of the cuff, and appropriate symbols or label for equipment or components that are sterile, have an expiration date, or are for single use	4.7
GENERAL REQUIREMENTS		
Test requirements	(type tests, samples, environmental conditions, etc.)	5
Electrical safety	Compliance with IEC 60601-1 if electricity is used	6.2
Mechanical safety	Should avoid rough surfaces, sharp corners and edges that could cause injury or damage	6.3
Mechanical strength	Should function properly after falling 25 cm (or 1 m for "shock resistant" sphygmomanometers) except for stationary devices; see compliance test	6.4.1
	Should function properly after shock and vibration; see compliance tests	6.4.2
ACCURACY AND OTHER KEY REQUIREMENTS		
Maximum error for the cuff pressure measurement over the nominal range	$\leq \pm 3$ mmHg (± 0.4 kPa) for the following conditions: temperature range of 15°C to 25°C, relative humidity range of 15% to 85% (non-condensing), and decreasing pressure; see compliance test $\leq \pm 3$ mmHg (± 0.4 kPa) or 2 % whichever is greater, for the following conditions: temperature range of 10°C to 40°C, relative	7.1.1

²⁰ "Medical Electrical Equipment—Part 2-30: Particular requirements for the basic safety and essential performance of automated non-invasive sphygmomanometers," NSI/AAMI/EC 80601-2-30:2009.

Criteria for Validating

Editorial review 187

Assessment of the validation of blood pressure monitors: a statistical reappraisal

Bruce A. Friedman^a, Bruce S. Alpert^b, David Osborn^c, L. Michael Prisant^d, David E. Quinn^e and John Seller^e

Protocols to determine the accuracy of noninvasive blood pressure monitors have been published by the Association for the Advancement of Medical Instrumentation, the British Hypertension Society, and the European Society of Hypertension (ESH). We compared the statistical basis for each of these protocols. Although the Association for the Advancement of Medical Instrumentation and British Hypertension Society protocols require a minimum of 85 participants, the ESH protocol requires only 33 participants. The reduced sample size results in a reduction in statistical power from 98 to 70%, which brings into question the applicability of the ESH (International) protocol. *Blood Press Monit* 13:187–191. © 2008 Wolters

Blood Pressure Monitoring 2008, 13:187–191

Keywords: Association for the Advancement of Medical Instrumentation, blood pressure measurement, British Hypertension Society, European Society of Hypertension, international protocol

^aGE Healthcare, Tampa, Florida, ^bUniversity of Tennessee Health Science Center, Memphis, Tennessee, ^cPhilips Healthcare, Andover, Massachusetts, ^dMedical College of Georgia, Augusta, Georgia and ^eWelchAllyn, Skaneateles Falls, New York, USA

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Tel: +1 813 887 2644; fax: +1 813 887 2552;
e-mail: bruce.friedman@med.ge.com

Received 10 March 2008; Revised 20 April 2008

BHS - Blood Pressure List - Microsoft Internet Explorer

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Address http://www.bhsoc.org/blood_pressure_list.stm Go Google European Hypertension



BHS
British Hypertension Society

British Hypertension Society

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Validated Blood Pressure Monitors List

Latest News

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[Automatic Digital Blood Pressure Devices](#)
(for Clinical use and also suitable for home/self assessment)

[Automated Blood Pressure Devices](#)
(for Clinical use)

[Aneroid Sphygmomanometers](#)
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[Ambulatory Blood Pressure Monitors](#)
- Oscillometric mode

[Ambulatory Blood Pressure Monitors](#)
- Auscultatory mode

[Manual Blood Pressure Devices](#)
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Statement to Manufacturers
If manufacturers have published evidence in the literature of their blood pressure devices having passed the BHS protocol or International protocol, and the device is not listed on our site and you would like it to be, please contact us at ;

BHS Information Service:
Jackie Howarth
BHS Administrative Officer
Clinical Sciences Building, Level 5, Leicester Royal Infirmary,
Leicester LE1 5RH

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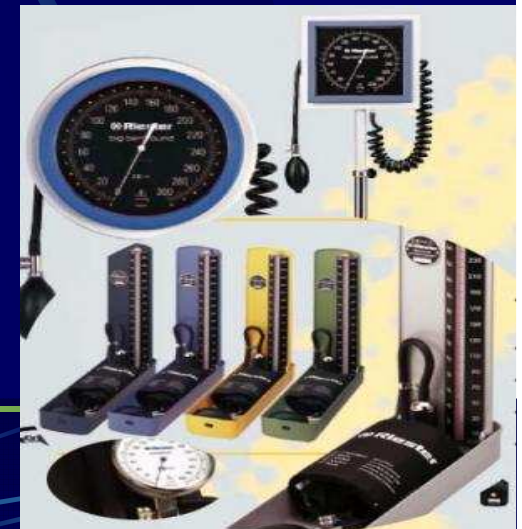
WORLD HEALTH ORGANIZATION

Mercury in Health Care

POLICY PAPER

August 2005

- Both mercury and aneroid sphygmomanometers have been in use for about 100 years, and when working properly, either gives accurate results.
- Aneroid sphygmomanometers provide accurate pressure measurements when a proper maintenance protocol is followed.



Health Care and the Environment: ***Global Trends***

Environmental Impact of Health Care

Waste Management

Volume

Incineration

Sustainable Purchasing

PVC

Mercury

Safe Injections

Indoor Environment

Healthy Food

Institutional Design

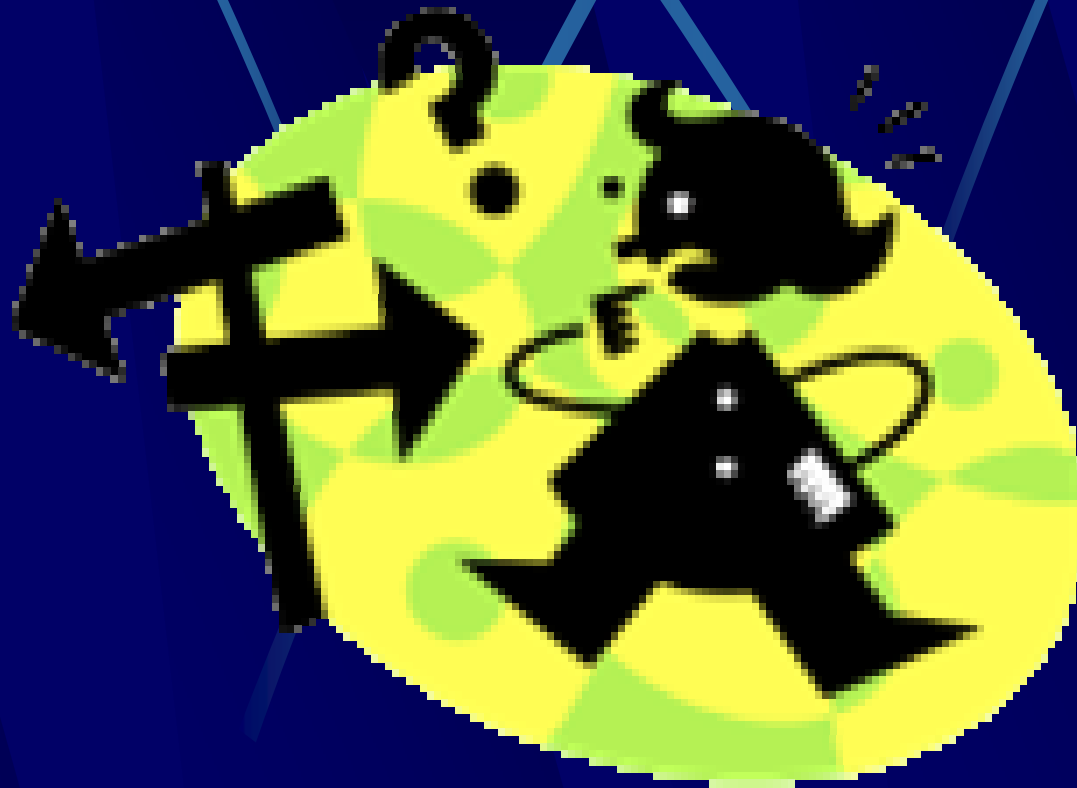
Climate Impact

The 3 Safeties

Patient – Worker - Community



Where do we start?
What do we do next?



Need CEO's Buy In:

Environmental Impact of Health Care

- "Environmental awareness in healthcare began and has been growing"
- "We think of environmental protection as preventive medicine on a grand scale."

David Lawrence, MD

CEO of Kaiser Permanente

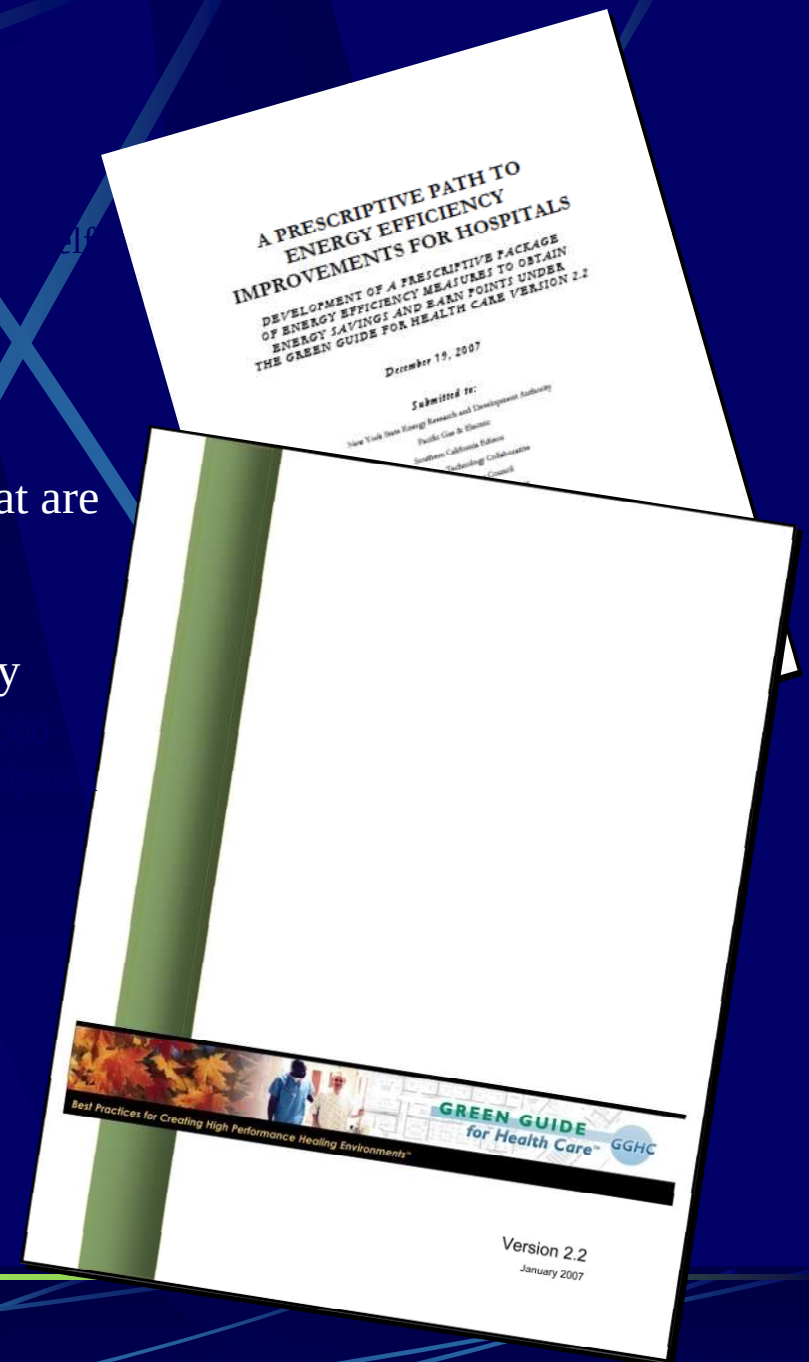
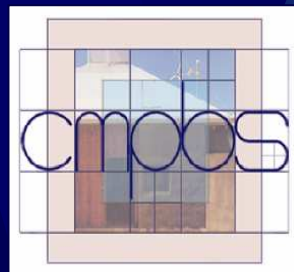




- First LEED Green Building tool, introduced in 2007
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- Green Guide for Healthcare

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• The Green Guide for Healthcare is a community of practice, a group of people who share information and best practices to improve the performance of the green building industry. The Green Guide for Healthcare is a community of practice, a group of people who share information and best practices to improve the performance of the green building industry.





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Access and download a broad range of resources about sustainable healthcare design, construction and operations, and the pillars of 21st century healthcare: carbon neutral, water balanced, toxic free, zero waste, socially just, and aspirational.

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Dell Children's Medical Center of Central Texas, Austin, TX.
Photo courtesy of John Durant

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GGHC Forum

GGHC Forums

	General Discussion Feel free to talk about anything and everything in this board.	10 Posts 6 Topics	Last post by Robin Guenther In Re: LEED or GGHC on October 14, 2010, 11:26:46 PM
	Projects	0 Posts 0 Topics	
	Operations Pilot Program	5 Posts 1 Topics	Last post by Robert Airo In Re: FM Prereq. 2 and Cre... on October 15, 2010, 12:18:11 PM

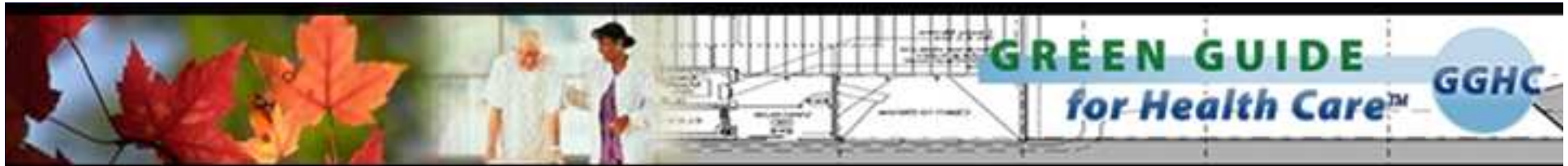
Child Boards: Integrated Operations & Education, Sustainable Sites Management, Transportation Operations, Facilities Management, Chemical Management, Waste Management, Environmental Services, Food Service, Environmentally Preferable Purchasing, Innovation in Operations.

GGHC Forum - Info Center

Forum Stats

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- 7 – Innovation in Design**

construction
section

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operations
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Health Care and the Environment: Global Trends

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Climate Impact



The 3 Safeties

Patient – Worker - Community

Addressing Climate Change in the Health Care Setting

Opportunities for Action

Online at:
[www.noharm.org](http://www.noharm.org/us)
/us





HEALTHY HOSPITALS HEALTHY PLANET HEALTHY PEOPLE

Addressing climate change
in health care settings



Discussion Draft

Online at:
www.noharm.org



http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

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Portfolio Manager Overview

Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment. Whether you own, manage, or hold properties for investment, Portfolio Manager can help you set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

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Anytown Health Facility - John Smith - 555-123-4567

East Central Area Reliability Coordination Agreement

kWh per Year:

Clean Energy Fraction:

Calculate how your energy use impacts health

Pollutants	Annual Emissions	People Affected	Cost
SO ₂ (Tons)	10.55	580,000	\$116,566
NO _x (Tons)	10.55	580,000	\$29,964
CO ₂ (Tons)	21,277.54	580,000	\$2 Picking
Mercury (Tons)	0.02	580,000	per year

Incidents

Incidents	Rate	People Affected	Cost
Premature Death	0.39	580,000	\$116,566
Chronic Bronchitis	0.39	580,000	\$29,964
Hospital Visit Incidents	0.39	580,000	\$5,934
Asthma Attacks	7.92	580,000	\$458
Respiratory Symptoms	377.20	580,000	\$17,938
Work Loss Days	69.67	580,000	\$11,894
Mercury Related	N/A	580,000	\$130,952
Totals:	N/A	\$2,884,504	\$306,445
Unintended Impacts/kWh:		0.1442	0.0151

Anytown Health Facility - John Smith - 555-123-4567

E-CAR Search Map

East Central Area Reliability Coordination Agreement

kWh per Year

Clean Energy Fraction Calculate

Calculate how your energy use impacts health

Pollutants	Air Quality Data	Health Impact Data
SO ₂ (Tons)	10.55	\$20,000 per year
NO _x (Tons)	10.55	\$20,000 per year
CO ₂ (Tons)	21,277.54	\$500,000 per year
Mercury (Tons)	0.52	\$50,000 per year

Incidents

Incidents	Health Impact Data	Medical Costs
Premature Death	0.39	\$116,565
Chronic Bronchitis	1.36	\$29,364
Hospital Visit Incidents	1.36	\$534
Asthma Attacks	7.92	\$458
Respiratory Symptoms	377.20	\$17,338
Work Loss Days	69.67	\$11,894
Mercury Related	N/A	\$130,352
Totals:	N/A	\$306,445
Unintended Impacts/kWh:	0.1442	0.0151

Try it Out!

For more information on purchasing
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As pressure for institutional transparency increases, "brown" energy may well be seen as carrying significant health costs and risks. By comparison energy efficiency and clean energy have advantages with respect to health, regulatory compliance, reliability, community benefits, reputation, fiduciary responsibility, liability, and climate change.

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The 3 Safeties

Patient – Worker - Community



Healthy Food

- Antibiotic-free meat/poultry
- rBGH-free milk
- Organic and other certified foods
- Certified coffees
- Locally-sourcing food
- Fast-food free zone
- Farmers' markets
- Hospital gardens
- Compost & reduction of food waste
- Hospital food policy
- Vending machine use

Menu of Change

Healthy Food in Health Care

A 2008 Survey of Healthy Food
in Health Care Pledge Hospitals



HEALTH CARE RESEARCH COLLABORATIVE



A Research Agenda for Advancing Patient, Worker and Environmental Health and Safety in the Health Care Sector

OCTOBER 2009

AUTHORS:

Susan Kaplan, JD
Peter Orris, MD, MPH
Rachel Machi



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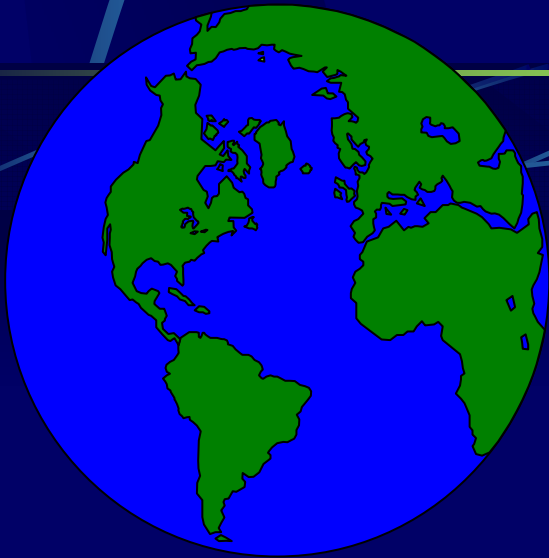
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165 hospital pilots

Health Care Without Harm

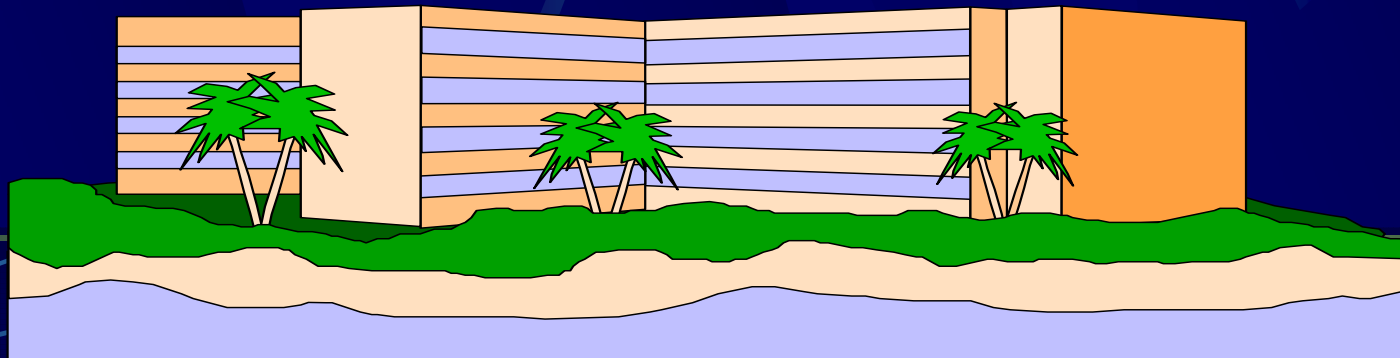
The Campaign for
Environmentally
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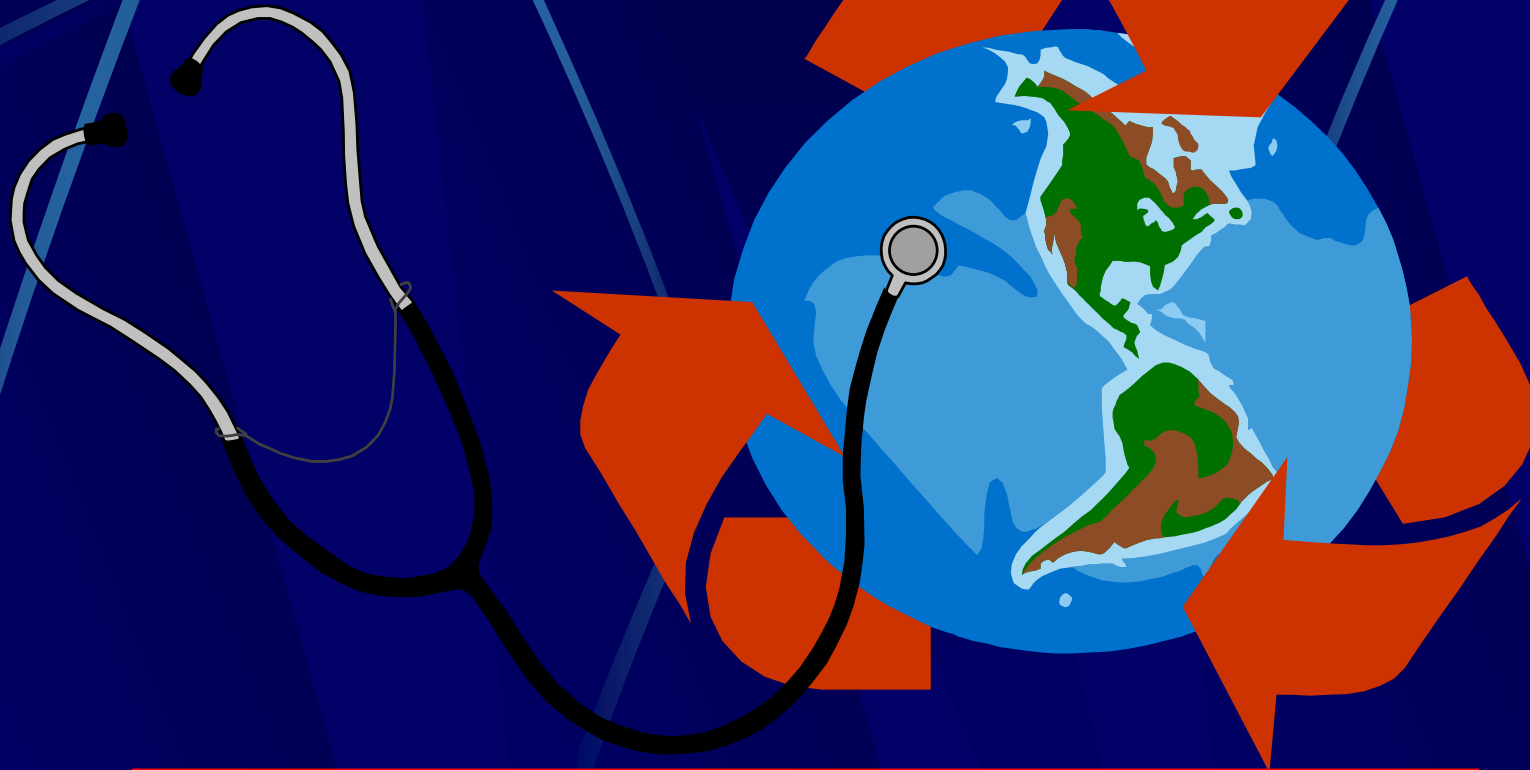
Web site: www.noharm.org

The Mission of Health Care Without Harm

To transform the health care industry so it is no longer a source of environmental harm by eliminating pollution in health care practices without compromising safety or care.



Global perspective



Partnership in collaboration

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September 22, 2010
Health Care Without Harm Press Release

Successful Implementation of Medical Waste Treatment in Tanzania

Health Care Without Harm and partners today released a report



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Thank you!

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Postings on the Internet***



Particularly
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Chief Technical Advisor, UNDP GEF Project

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and materials to be edited by me for presentation***

