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# CAN HOSPITALS SAVE MONEY AND BE CLIMATE LEADERS TOO?

*Yes they can! And here's how ...*



Association for Climate Health

[www.a4ch.org](http://www.a4ch.org)

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*“Health care is responsible for **10%** of US greenhouse gases. If U.S. health care were a country, it would be the **13<sup>th</sup>** largest emitter of greenhouse gases **in the world**. And it’s not just greenhouse gases, U.S. health care is also responsible for 9% of the country’s air pollution, 12% of acid rain emissions, and 10% of smog-forming emissions ... **It does not have to be this way.**” - Thiel and Whelan, Fortune, September 5, 2019.*

*“First, do no harm.” - Hippocrates*

# HOSPITALS STRUGGLE WHILE NEEDS GET MORE PRESSING

- Many hospitals were struggling even before COVID hit
- US hospitals lost over \$200 billion in the Spring of 2020 as the pandemic worsened
- More unemployment means more uninsured, with further loss of revenues for healthcare
- Yet the climate crisis worsens, and healthcare is a significant contributor
- Increasingly healthcare systems want to reduce their climate impact, but going green usually seems more expensive

***BUT IT ISN'T ALWAYS SO!***

***Because many climate-saving strategies can actually save money ...***



# IDENTIFY THE “LOW-HANGING FRUIT” – PROJECTS WHICH ARE COST-SAVING AND CLIMATE-POSITIVE



Some of our recommendations cover the entire hospital. Others focus on the Operating Room. Why? Because only a quarter of hospitals stays involve surgical procedures, yet ORs account for:

- Almost half a hospital’s overall costs
- Up to a third of a hospital’s waste
- Up to 60% of a hospital’s medical waste
- Up to 6 times more energy per square foot than the rest of the hospital
- The most harmful greenhouse gases come from anesthesia in the OR

So we shine a particularly strong light on those areas

## SAVINGS ON WHOLE HOSPITAL PROJECTS

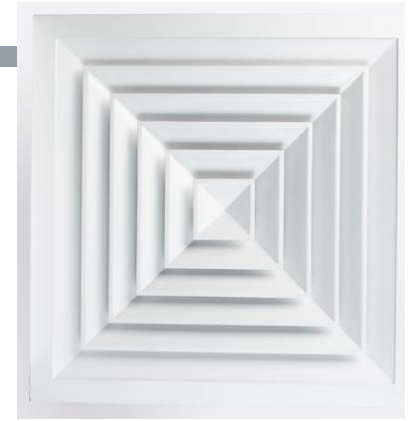
80 facilities did energy efficiency projects with a median annual savings of **\$ 49,000**

Various HVAC, lighting and energy projects resulted in more annual savings:

\$ Heating	\$20,400
\$ Cooling	\$24,900
\$ Lighting	\$15,200
\$ Information technology	\$ 6,500
\$ Water heating	\$ 2,400
\$ Medical technology	\$ 2,000

Planning some new construction? Keep long term energy costs low by building to LEED standards - <https://www.usgbc.org/>

# HIGH RETURN HVAC PROJECTS



- Schedule regular preventive maintenance to keep systems working at top efficiency
- Energy audits every 2-3 years – heating, cooling, lighting, water heaters, computers etc.
  - Your local utility may provide this for free
  - Or do it yourselves with free training from the AHA's <https://www.energytocare.org/educational-tools>
- Implement energy conservation programs from audit results
- When replacing equipment, select from *Energy-Star* labelled choices
- Create a contest inviting employees to share their energy and waste reducing ideas. Provide recognition and/or rewards for **all** good ideas
- Consider rooftop solar panels and lock in low energy costs for years to come

## CUT WASTE AND WASTE DISPOSAL COSTS

- ↑ Increase reuse of clinical products and equipment
- ↑ Increase reusable sharps use
- ↑ Increase recycling of medical plastics – bottles, basins, trays, blue wrap, etc.
- ↑ Increase donation of used furniture, linens, outdated equipment & supplies
  - ❖ Ask your staff for local nonprofits and schools that can use these discards
- ↑ Disinfect regulated medical waste onsite (autoclave or other technology)
- ↑ Recycle, reprocess and reduce buying of new solvents, alcohols and other chemicals for hospital labs
- ↑ Make double-sided printing the default setting for copies and printers
- ↑ Make electronic copies your go-to instead of paper reports
  - ❖ Ask your staff to suggest more ways to cut back



## COST SAVINGS OF MORE GREEN HOSPITAL PROGRAMS

Median Annual Savings	Small hospital (<200 beds)	Large hospital (>200 beds)
Reusable sharps container program	\$4,896	\$21,833
Solvent reprocessing	\$3,580	\$18,847

*Data drawn from Project Greenhealth, 2018-9*



# FOOD PRACTICES TO SAVE MONEY AND REDUCE CLIMATE IMPACT

- Establish a program to reduce food waste
  - ❖ Invite kitchen staff to suggest ideas based on their experience
- Reduce beef and lamb served to patients and in the cafeteria
  - ✓ Reduce portion size or ratio to other ingredients in dish
  - ✓ Reduce frequency on the menu
- Donate edible food waste to local food banks, soup kitchens, shelters
- Compost food waste for use on hospital grounds or in community
- Install filtered water stations and eliminate bottled water for patients and in the cafeteria



## BIGGEST SAVINGS ON GREEN PROJECTS IN THE OR

	Avg annual savings per hospital	Avg annual savings per OR
Reprocessing single use medical devices	\$215,000	\$12,000
Reusable medical products	\$185,000	\$15,600
HVAC setback in OR	\$112,000	\$7,400
Reusable sterilization containers	\$106,000	\$7,600
OR kit reformulation	\$84,000	\$9,500
Fluid management systems	\$51,000	\$3,600
LED surgical lighting in the OR	\$13,000	\$ 600
Reduce anesthesia gas use	can be substantial	varies

*Data drawn from Project Greenhealth, 2018-9*

# REUSE SINGLE-USE MEDICAL EQUIPMENT AND DEVICES



The Association of Medical Device

Reprocessors estimates reprocessing can:

- Reduce the cost of devices by 50%
- Divert an average 50,000 lbs of medical waste from landfills per hospital yearly

Reprocessing includes cleaning, restoring, sterilizing and repackaging for sale to institutions including the Mayo Clinic, which has been using reprocessed devices since 2015.

Hospitals can do some of this themselves. Or, send it out to 3<sup>rd</sup> parties, allowing more specialized devices to be reused, also passing accountability and liability to others well-trained in this work.

# TOP 10 REUSABLE ITEMS PURCHASED FOR SURGERY



- Patient positioning devices
- Patient linens
- Safety belts
- Surgical basins, pitchers, medicine cups
- Laryngoscope blades and handles
- Blood pressure cuffs
- Pulse-ox sensors
- Surgical towels
- Light handles
- Trocars

*Data from Project Greenhealth, 2018-9.*

# TOP 10 DEVICES SENT FOR REPROCESSING

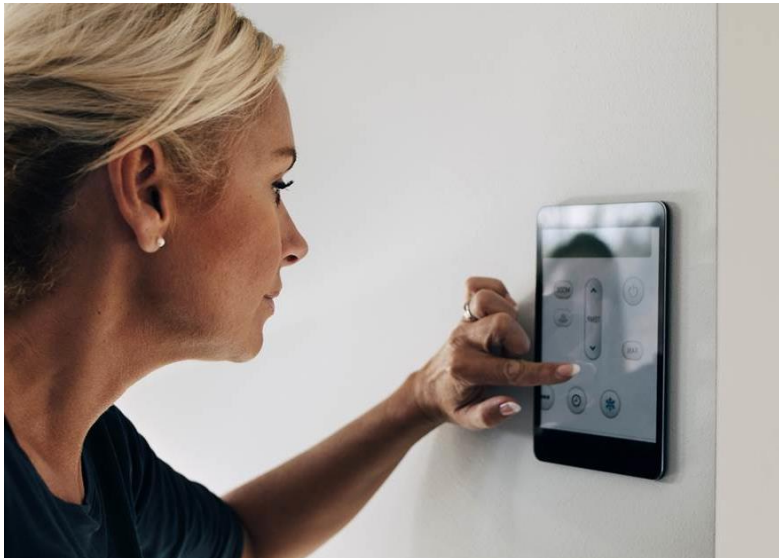
- Bits/burs/blades
- Ligature sealers/dividers
- Ultrasonic scalpels
- DVT sleeves/Sequential compression
- Arthroscopic wands and shavers
- Trocars
- Laparoscopic components: scissors/scissor tips, needle drivers/suture passers, dissectors and graspers
- ECG leads, cables and lead wires
- Multi-clip appliers
- Reamers





## REDUCE ENERGY USED IN THE **OR** WHEN VACANT

- ↓ Reduce number of air changes per hour when not in use (HVAC setting) via occupancy sensor, programmed schedules or other systems
- ↓ Install LED surgical lighting
- ↓ Reduce lighting when not in use



Energy use in the OR can be many times higher than in the rest of the hospital. So this is a good place to reduce energy waste.

## WASTE REDUCTION IN THE OR

- Divert OR waste which doesn't need special treatment
  - ✓ Pre-incision waste
  - ✓ Non-infectious solid waste created during the procedure
  - ✓ Non-infectious solid waste created after the procedure
- Send older medical devices for reprocessing
- Purchase reprocessed medical devices instead of new
- ❖ Invite suggestions from OR personnel on reducing unnecessary waste
- ❖ Encourage less costly low climate-impact anesthesia choices by clinicians



Anesthesia gas is a major source of global warming. As sedation wears off, patients breathe the gas out largely unchanged, to be vented outside to the atmosphere. Even with small total emissions, waste anesthesia gases cause more global warming than carbon dioxide or methane per molecule, partly because they do not degrade easily.

	Year introduced	Years in the atmosphere	Global Warming Potential (over 100 yrs) compared to CO <sub>2</sub>	Est emissions (tons/ year), in 2014
Halothane	1956	1	50 x	250
Isoflurane	1981	3.2	510 x	880
Desflurane	1992	14	2540 x	960
Sevoflurane	1993-5	1.1	130 x	1200
Nitrous oxide	1840s	114	298 x	5,300,000*

\* Some of this is from agricultural use.

*Data on widely used WAGs from Vollmer, et al, "Modern inhalation anesthetics: Potent greenhouse gases in the global atmosphere," AGU Pubs. Data on N2O from Chestney, Nina, Scientific American, 2013 and includes emissions from agricultural fertilizers and natural decay of plant material in forests, etc.*



Some forward-thinking health care systems in the US have begun to change their practices, with **excellent clinical results**:

- Providence Health & Services in Oregon reduced their anesthesia gas impact by 85% when they eliminated desflurane. Their patients **did not need more time** in the OR or the recovery room. This measure also cut gas costs by **more than half**.
- Yale-New Haven Health System removed desflurane from its formulary in 2013.
- Kaiser Permanente on the West Coast has been progressively eliminating desflurane since 2014.

Some individual clinicians have changed their practices, and if you know of any, we would love to hear their stories

Sherman et al, "Inhaled Anesthesia Challenge," *ASA Monitor*, April 2020.



## SOME COST-SAVINGS STRATEGIES FOR ANESTHESIA USE

- ❖ Educate clinicians on the high cost and climate harm of desflurane and other anesthesia gases. Involve them in discussing and planning a new approach.
- ✓ Reduce costly desflurane anesthesia gas use. Some common approaches:
  - Remove desflurane vaporizers from the OR
  - Remove desflurane altogether from the formulary
  - Encourage lower impact alternatives
- ✓ Reduce fresh gas flow rates
- ✓ Collect data and send their gas use to clinicians on a monthly basis
  - ❖ You can make a friendly contest out of this
- ✓ Reduce the use of nitrous oxide as an anesthesia choice and as a carrier gas for volatile anesthesia gas

# EASY ANESTHESIA SUBSTITUTIONS



- Choose **sevoflurane** instead of isoflurane or desflurane
- Use **O<sub>2</sub>/air mixture** instead of N<sub>2</sub>O/air mixture
- Where possible, use **propofol, IV anesthesia, neuraxial, regional or peripheral nerve blocks** instead of gas
- For childbirth, encourage **natural birth techniques** or **epidurals**

## EXAMPLES OF COST SAVINGS FROM ELIMINATING DESFLURANE

- \$ Oregon's Providence Health Systems saved **\$500,000** per year at its 8 hospitals
- \$ Virginia Mason Hospital saved **\$30,000** a year
- \$ The University of Wisconsin Hospital saved **\$120,000** annually by reducing though not eliminating desflurane
- \$ University of Utah Hospital stopped using desflurane when desflurane cost **\$14** per hour while isoflurane cost only **\$0.53**. Switching reduced the hospital's greenhouse gas emissions by 25%.



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## EQUIPMENT CAN ALSO BE USED TO REDUCE GAS EMISSIONS

- Use circle breathing systems to reduce fresh gas and emissions
- Set system alerts to warn if the flow rate exceeds a pre-set limit
- Add photochemical air purification system using UV light for ethers and N<sub>2</sub>O
- Install capturing systems to reclaim volatile gases for reuse
- Install catalytic converters to eliminate waste N<sub>2</sub>O
- Install anesthesia recycling systems
- Retrofit existing anesthesia equipment with supplemental waste gas trapping, destroying, scavenging or sequestering equipment

Adding new equipment will not reduce costs, but will preserve clinician's freedom to choose any anesthesia while still reducing the hospital's climate impact.

## SO LET'S GET GOING!



These 30+ ideas can save your hospital money every year, and also reduce greenhouse gases, pollution into the local water table and other good outcomes.

Right now - jot down what you need to kick-start a great new cost-saving green initiative:

- The 5 top ideas you just heard which can make a difference in your organization
- The people you can enlist to help
- The best format to get things started – email, meeting, share this presentation...

*And with that – goodbye and good luck!*



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