

Decarbonizing the Operating Room

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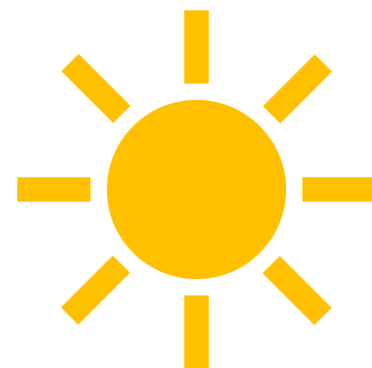
Introduction

I have no conflicts of interest or discloses.



Objectives

1. Provide brief overview of climate change and explain how climate change impacts human health
2. Describe how the healthcare sector contributes to climate change
3. Discuss opportunities to limit the environmental impact of surgery



CO_2

CH_4

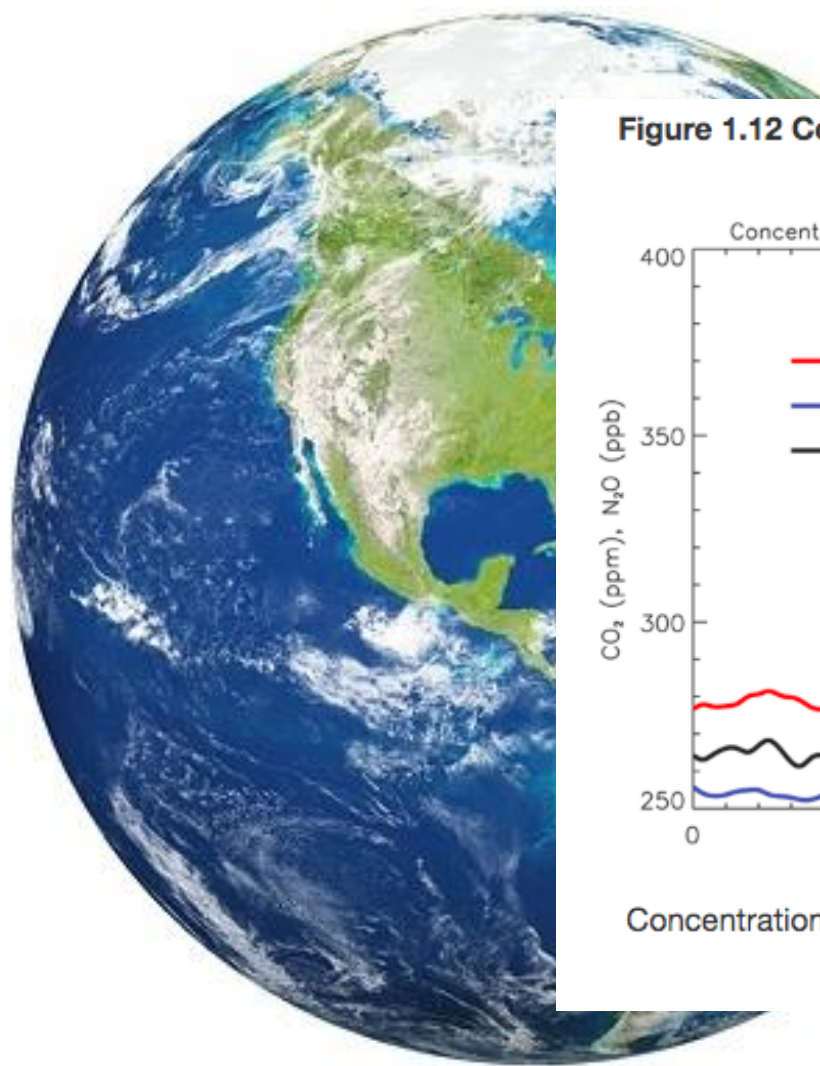
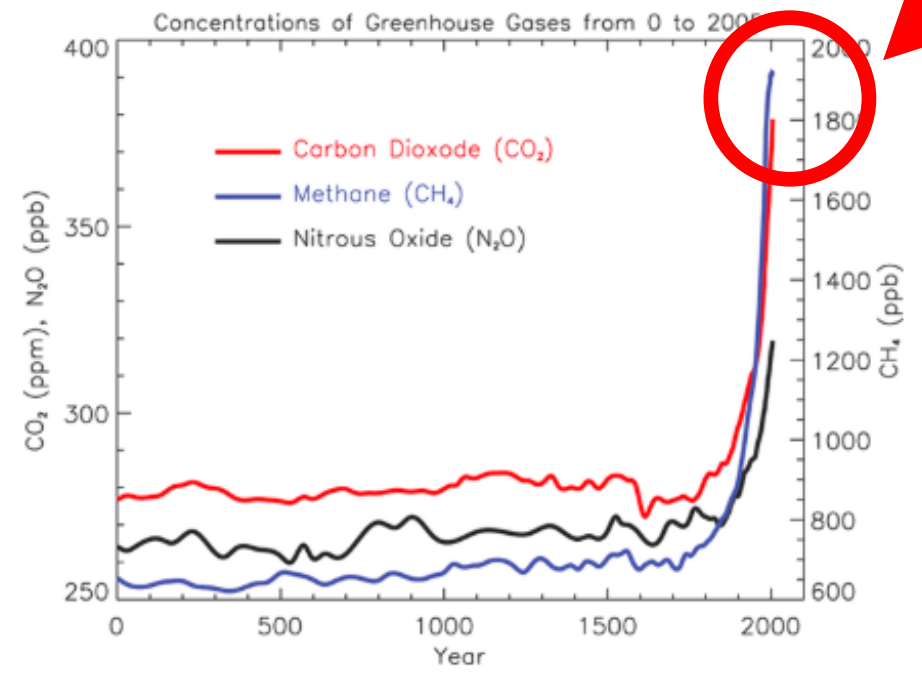


Figure 1.12 Concentrations of Greenhouse Gases from 0 to 2005



That's us!

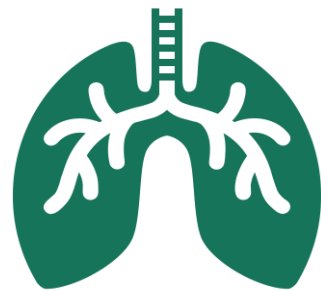


Concentration units are parts per million (ppm) or parts per billion (ppb)

Climate change & human health



Heat-related illness



Air quality & respiratory illness



Infectious disease



Extreme weather-related injury



Climate change will be the greatest threat to human health in the 21st century.

The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment



GlobalChange.gov
U.S. Global Change Research Program

U.S. Healthcare Sector



8-10% of U.S.
greenhouse
gases

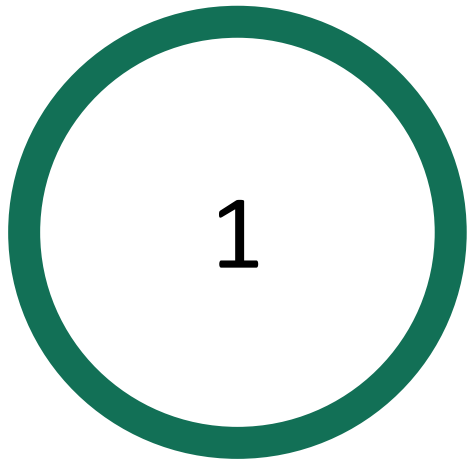


4 billion pounds landfill
bound waste annually

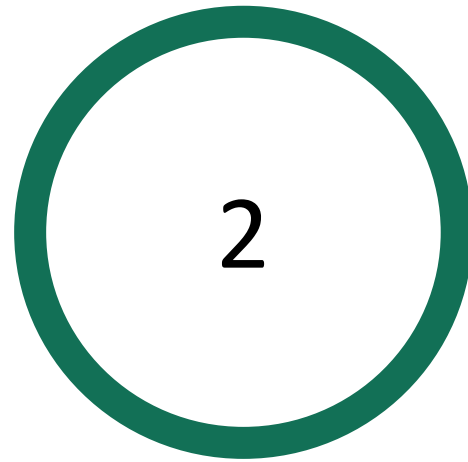


470,000 disability
adjusted life years lost
annually

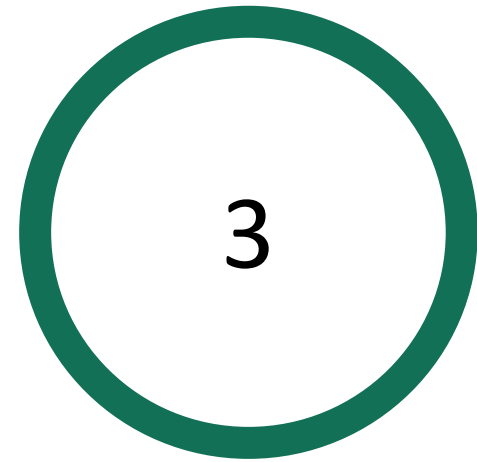
Greenhouse Gas Protocol *in the operating room*



Direct emissions
Anesthetic gases

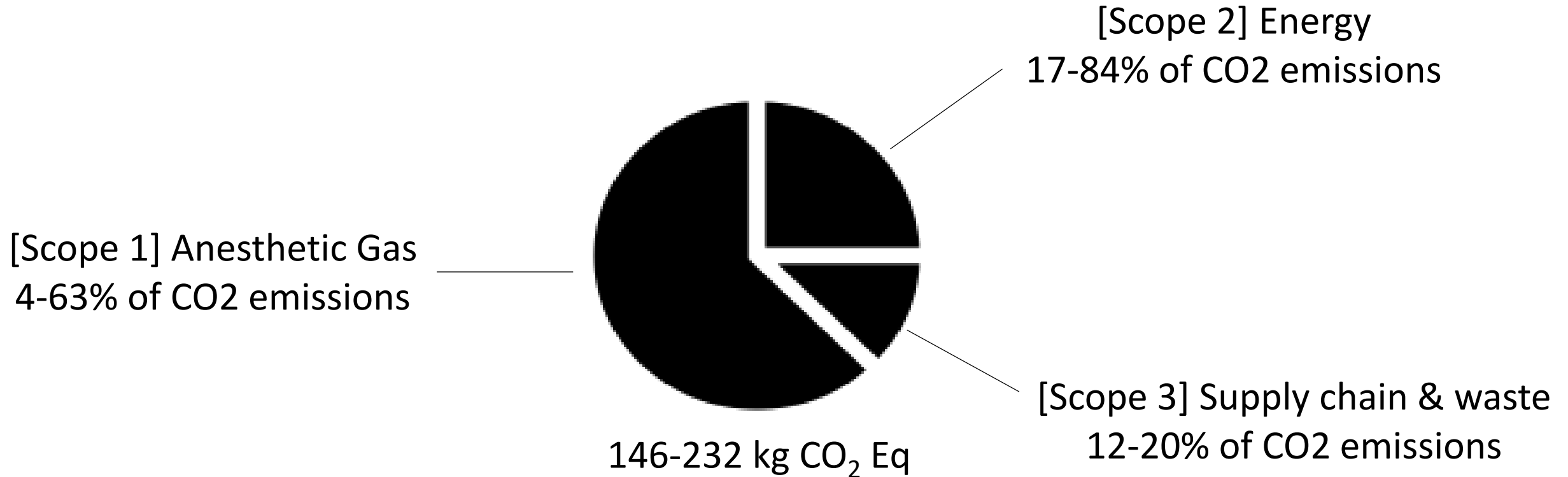


**Indirect emissions
from electricity**
HVAC, lighting



**Other indirect
emissions**
*Supply chain, waste
disposal*

Operating Rooms



1

Anesthetic Gases

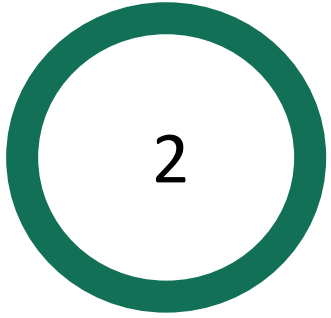
Inhaled Gas	GWP ₂₀
Carbon Dioxide (ref)	1
Sevoflurane	349
Isoflurane	1401
Desflurane	3714
Nitrous Oxide	289

- Lowest fresh gas flows
- Anesthetic choice
- Waste anesthetic gas capture/destruction

Quality Metrics



SUS 01 – Percentage of cases with mean fresh gas flow (FGF) equal to or less than 3L/min during administration of halogenated hydrocarbons or nitrous oxide.



Energy (HVAC*, lighting)

- Occupancy-based HVAC setbacks
- LED lighting
- Renewable energy investment

Median annual cost-savings

HVAC setback, per OR	\$2,585
HVAC setback, per facility	\$33,604
LED lighting, per OR	\$166
LED lighting, per facility	\$4,380

3

Supply chain and waste management

- Reduce, reuse, recycle
- Reprocess



16-25x lower emissions

Reduce/reuse opportunities

Reusable gowns, textiles & basins

Reusable hard cases for surgical instrumentation

OR kit reformulation

Reusable sharps containers

Reprocessed Devices



Metro Health

3

Supply chain and waste management

- Reduce, reuse, recycle
- Reprocess
- Biohazard waste management
- Environmentally preferred purchasing



8x more expensive
>90% miscategorized

Environmentally Preferred Purchasing

Reviewed June 2012

Procurement and Supply Principles



Environmentally Preferable Purchasing Principles

Statement

In support of Kaiser Permanente's (KP) mission to improve the health of our members and the communities we serve, the Procurement and Supply staff within KP are committed to applying guidelines and specifications of Environmentally Preferred Purchasing to all major, strategic, and critical purchasing decisions. KP's Sourcing Core Groups, supported by purchasing and environmental stewardship staff, will evaluate the environmental impacts (e.g., waste, toxicity) of products and services in their effort to select healthy and safe products and services that are also environmentally sound. KP personnel involved with product selection are required to communicate to the marketplace that KP expects suppliers to continuously develop price competitive products that conform to our EPP guidelines and specifications as defined in this document.

Use greener chemicals, chemicals that are inherently less hazardous and release little to no toxic by-products across their lifecycle.

products and services should.

Promote the use of renewable materials by increasing the use of sustainable, bio-based materials and reducing the use of fossil fuel-based materials.

- Support **healthy food systems** by sourcing food products that are local, seasonal, nutritious and produced in a way that minimizes degradation to human and environmental health and vitality.
- Promote **land stewardship** by cultivating healthy ecosystems and protecting natural resources.
- Promote **sustainable energy** by using renewable energy sources and reducing energy use.
- Protect **clean air** by minimizing pollutants.
- Contribute to the availability of **clean water** by minimizing water use and pollution, and avoiding bottled water products.
- **Minimize waste** by implementing the three "Rs": reduce, reuse and recycle.
- Use **environmentally sound waste disposal** technologies where reuse, reduction and recycling cannot be achieved.

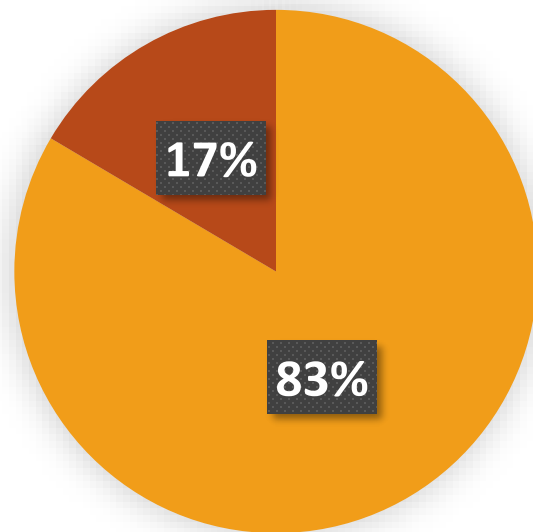
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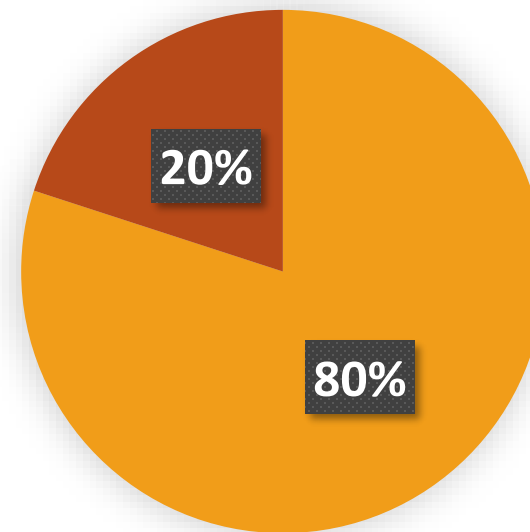
Environmentally Preferred Sourcing

Involving employees

Health System



Operating Rooms



Green teams & sustainability champions



Beaumont Hospital

Recommendations

1. Find out what already exists in your hospital
2. Review your hospitals current successes and opportunities for improvement
3. Target high impact, low energy input solutions
4. Work with leadership to implement deeper changes



Introduction of the Surgical Providers Assessment and Response to Climate Change (SPARC2) Tool

One Small Step Toward Reducing the Carbon Footprint of Surgical Care

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Thank you!

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