

Implementing Environmentally Sustainable Practices in an Outpatient Oncology Clinic

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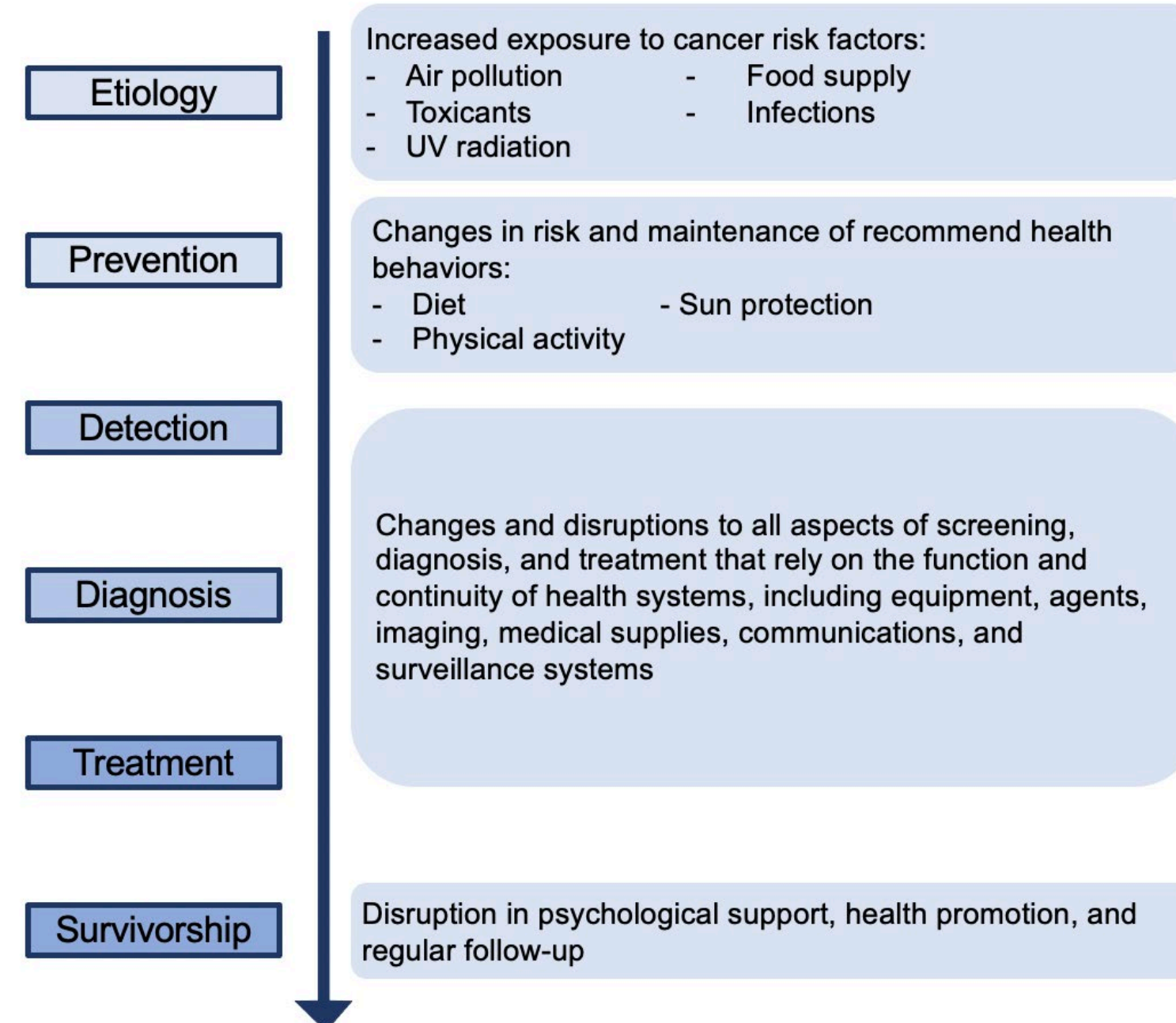


Learning Objectives

- 1) Describe examples of climate-related disruptions along the cancer control continuum.
- 2) Identify key drivers of waste within the healthcare supply chain and life cycle.
- 3) Develop sustainable, cost-effective interventions specific to your healthcare setting.

Issue: Climate Health is Patient Health

- The healthcare industry is responsible for ~10% of national greenhouse gas emissions (1)
- Climate change impact the cancer control continuum, while the cancer control continuum impacts climate change
- Of healthcare emissions, 71% is attributed to indirect, Scope 3 sources that derived from the healthcare supply chain (2)



Goal: Reduce the Climate Impact of Healthcare

Integrate climate-smart care into an outpatient radiation oncology center through multi-targeted interventions, with a focus on Scope 3 emissions

Sustainable Action Across the Cancer Control Continuum

REDUCE: Procedural waste audit

Problem: Procedures are a resource-intensive mode of healthcare delivery and generate significant amounts of waste; biohazardous waste is ~11% more costly to dispose

Intervention: Waste audit

- Assess waste sorting practices (solid vs biohazard)
- Determine single-use products that can be converted to reusable
- Eliminate use of extraneous products



Impact:

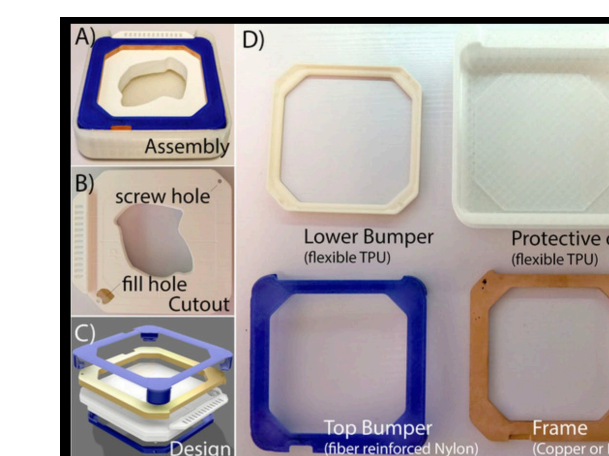
- Decreased waste generation
- Improved waste sorting efficiency

RECYCLE: Non-toxic recyclable 3D-printed collimators

Problem: Cerrobend electron blocks often contain toxic lead and cadmium

Intervention: 3D-printed collimators

- 3D printed shell for tungsten ball bearings = recyclable
- All other components = reusable



Impact:

- Reusable products reduce emissions associated with supply chain
- Reduce labor costs by 0.3-0.5 full-time-equivalents

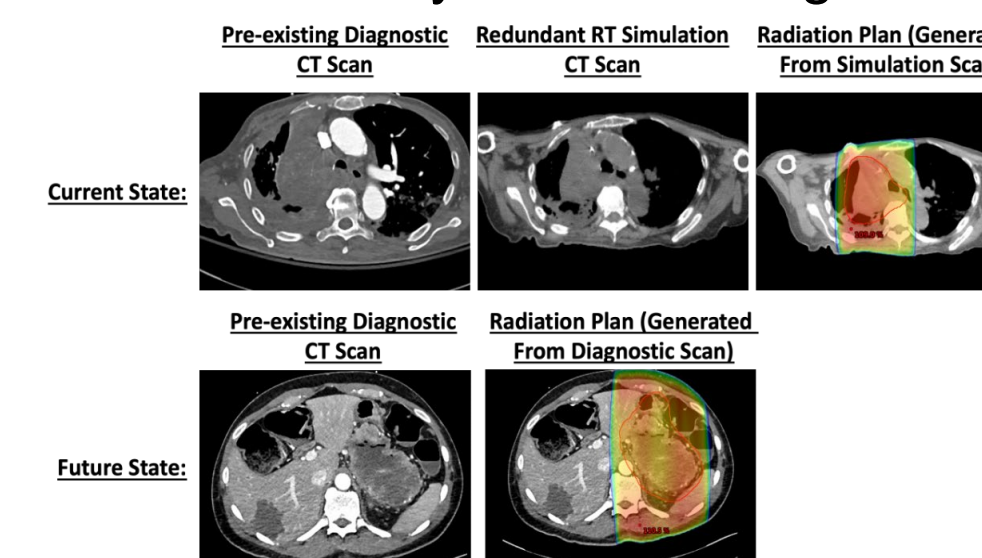
REUSE: Use of diagnostic imaging for palliative treatment planning

Problem: Imaging for palliative treatment planning purposes is often redundant to readily available diagnostic images and time-inefficient

Intervention: Implement workflow to use diagnostic imaging studies for palliative treatment planning

Impact:

- Decreased use of CT scans and appointments -> \$5k/y saved
- Reduced travel
- Quicker time to treatment



RETHINK: Telemedicine audit

Problem: Patient transport to myriad cancer care appointments contribute significantly to healthcare-related emissions

Intervention: Telemedicine audit

Impact:

- Savings of 339 metric tons of CO₂ equivalents
- Estimate travel- and opportunity-cost savings for patients by \$402,684 and \$530,588 per annum, respectively.



Actions and Future Directions

- ▶ Department level
 - Cancer center water and energy audit
 - Waste audit of therapy department
 - Re-examine sterile practices and need for barrier protection
 - Appropriate use criteria for telemedicine
- ▶ Hospital level
 - Climate health equity education
 - Dissemination of sustainable practices
- ▶ National level
 - Brachytherapy waste audit tool



Key Takeaways

- Climate-smart interventions are feasible and resource-efficient with quantifiable waste-and cost-savings
- Needs based on department, practice, and health care system are different, although fundamental concepts are often shared:
 - Reduce
 - Reuse
 - Recycle
 - Rethink
- Approaches identified here can and should be amplified across entire healthcare system

Disclosures

Both Drs. Frick and Baniel have no disclosures to report.

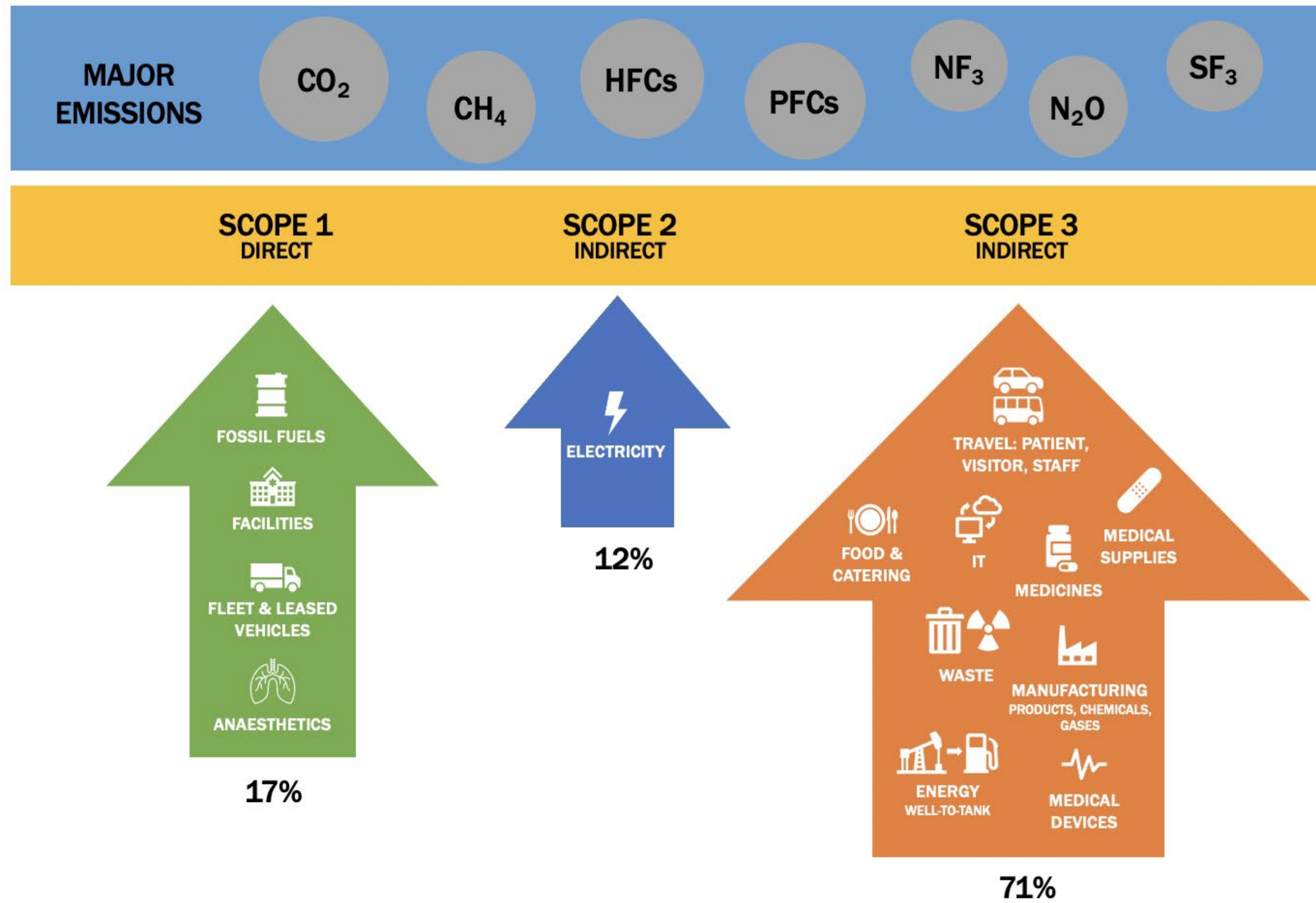
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References

- (1) Sherman J, MacNeill A, Thiel C. Reducing pollution from the health care industry. JAMA2019; 322: 1043-44
- (2) https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint_092319.pdf

The cancer control continuum impacts climate change

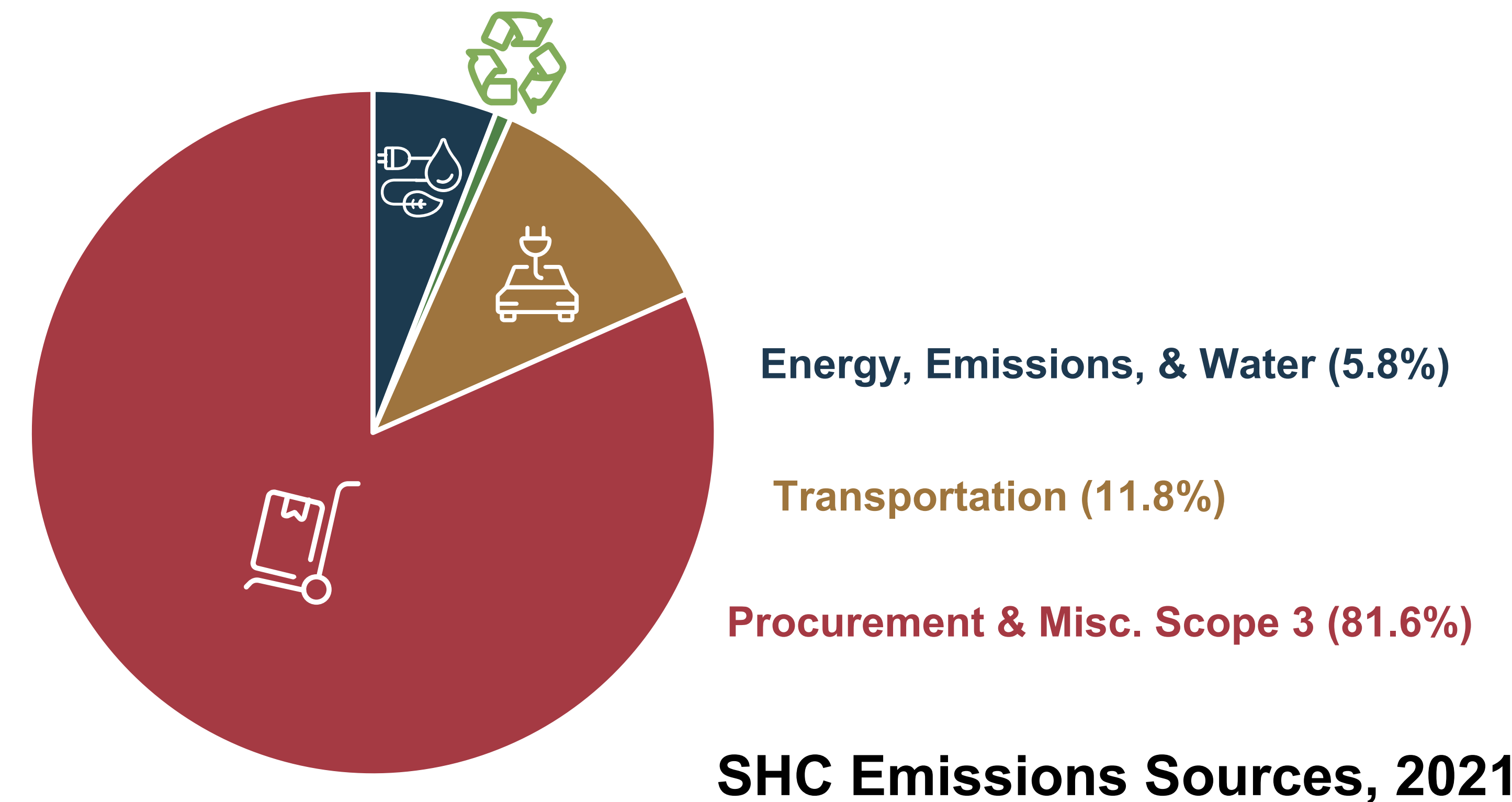


29lbs of waste generated per hospital bed, per day

x **6,093** Hospitals in the United States

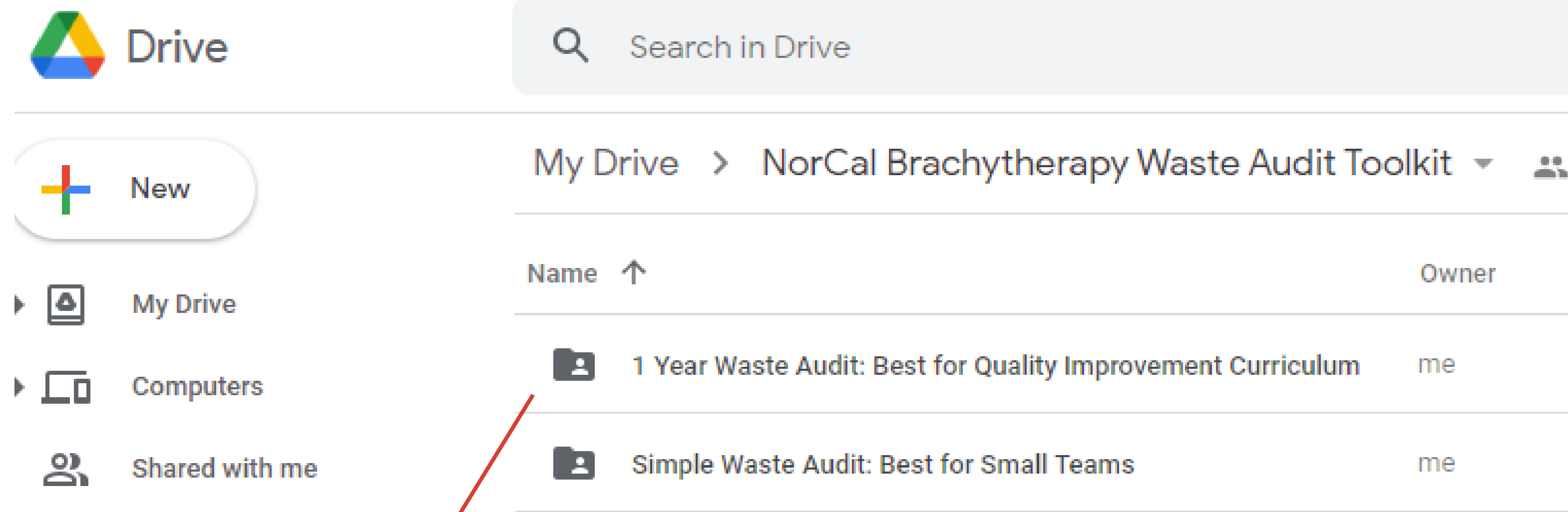
= **>5 Million Tons** of healthcare associated waste generated each year

\$10 Billion annual spending on waste disposal



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Norcal Brachytherapy Waste Audit Toolkit



Transitioning to Environmentally Sustainable Brachytherapy Care

Introduction

Climate change is the greatest global health threat of the 21st century.¹ Today, the healthcare sector is on the front lines of the climate crisis, with patients bearing the increasing burden of disease attributable to a changing climate. Equally important, healthcare significantly contributes to greenhouse gas (GHG) emissions. In the United States, health care is responsible for nearly 8.5% of GHG emissions and the loss of 388,000 disability-adjusted life-years annually.²

Increasingly, healthcare professionals and health systems are taking steps to promote and initiate the transition to sustainable, climate-smart practices.³⁻¹⁰ Brachytherapy is *uniquely poised* to play a pioneering and critical role within the field of radiation oncology in transitioning to environmentally sustainable radiotherapy care.

Simple Brachytherapy Waste Audit Toolkit Overview

What is this Toolkit? The goal of this toolkit is to provide a user with everything they might need to feel comfortable planning and implementing a Quality Improvement project; specifically, a brachytherapy waste audit.

What is a waste audit? A waste audit is a quality improvement process by which the current practices and supply usage of a department/team/unit are measured to identify ways to reduce waste and increase sustainability.

Examples

- [Dumpster Diving in the Emergency Department: Quantity and Characteristics of Waste at a Level I Trauma Center](#)
- [Waste generated during glaucoma](#)
- [Operating room waste disposal](#)
- [Auditing Operating Room Recycling](#)

Month 1: Getting Started

Welcome - we are so excited you are here. The purpose of this month is to learn about the intersection between climate/patient health, oncology, and sustainability. Today, climate change is the greatest threat to public health in the 21st century yet medical training lacks formal medical education on such topics.

In this folder we have compiled a collection of papers, podcasts, and resources we hope you might find useful as you embark on your climate health and quality improvement journey via a **brachytherapy waste audit**. Also included are resources for completing a quality improvement project. These resources are by no means required but rather hope you will find them useful in establishing QI skills/knowledge prior to starting your project.

The single most actionable document available for your reading would be that included in this folder - "[Why Sustainable Brachy Care](#)", which we invite you to peruse.

Happy reading! |



Simple: Data Collection and Run Chart

Case #	Date	Auditor	Physician	Resident?	APP?	Additional staff?	Type of visit (New, Return, Procedure etc)	Disease Site (GYN/GU)	Procedure type (GU; HDR/LDR; GYN: T&O, Cylinder, Syed)
1									
2	1								
3	2								
4	3								
5	4								
6	5								

Conduct your own waste audit today!



Month 1: Getting Started
Month 2: Assemble the Team
Month 3: Preparing for the Waste Audit
Month 4-6: Baseline Waste Data Collection
Month 7: Data Analysis
Month 8: Share with Key Stakeholders
Month 9: Prepare for Implementation
Month 10-11: Implement Changes, Begin Post-Intervention Audit
Month 12: Secondary Data Analysis, Team Feedback
Brachytherapy Waste Audit Toolkit: Overview and Timeline