Disposable vs. Reusable Gowns & Greenhouse Gas Baseline

Fairview Medical Center

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Fairview Medical Center

- Community-based health care system founded in 1906
- Fairview is partnered with the University of Minnesota Medical School in Minneapolis
- 2,500 licensed beds
- 7 hospitals, 50 primary care clinics and 37 specialty clinics
- Improve community health through core values of dignity, integrity, service and compassion
Motivations for Change

• Healthy environment
good for community
health

• Reduce environmental
impact
  – energy
  – resource
  – water
  – waste

• Possible regulation of
the healthcare industry
Reasons for MnTAP Assistance

• Corporate Green Charter goals
• Life cycle and infection prevention assessment of surgical and isolation gowns
• Carbon emissions baseline
• Cost savings
Gown Life Cycle Assessment

• Chemotherapy, isolation & surgical
• Environmental attributes: waste, resource consumption
• Costs: purchase, waste, maintenance
• Infection prevention
LCA Approach

- Gather cost, waste and resource data
- Compiling and compare
- Review literature
  - Infection prevention attributes
- Meet with vendors
- LCA database & software
## Gown Cost and Waste Assessment

<table>
<thead>
<tr>
<th></th>
<th>Purchase and Laundering Cost/Year</th>
<th>Waste Disposal Costs/Year</th>
<th>Total Cost</th>
<th>Total Waste (lbs/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reusable</td>
<td>$750,000</td>
<td>$3,500</td>
<td>$753,500</td>
<td>32,399</td>
</tr>
<tr>
<td>Kimberly-Clark</td>
<td>$950,000</td>
<td>$5,200</td>
<td>$955,200</td>
<td>178,115</td>
</tr>
<tr>
<td>Cardinal</td>
<td>$750,000</td>
<td>$5,200</td>
<td>$755,200</td>
<td>178,115</td>
</tr>
</tbody>
</table>

- **Switch to Reusable Gowns:**
  - From Kimberly-Clark ~ $200,000
  - From Cardinal ~ -$2,000
- **Waste Savings ~ 145,700 lbs/year**
Infection Prevention

- University of Minnesota online library database searches: journals, books, newspapers, magazines
- Found five related articles
  - 4 compare disposable vs. reusable
  - 1 discusses laundering impacts on reusable materials
- No statistically significant data to support disposable or reusable as better for infection prevention
- Laundering can affect reusable material
  - Use gowns made of 99% polyester, 1% carbon with plain, woven construction
Healthcare Buildings and Energy

Healthcare buildings are among the least prevalent commercial building types. The chart shows the number of buildings (thousand) across different types.

Energy Use in Healthcare

• Average energy use commercial buildings = 90.5 BTU/sq.ft.

• Healthcare uses ~240 BTU/sq. ft.

• About 40% more

How is energy used in healthcare?

- **Space Heating**: 129 trillion Btu (23%)  
- **Office Equipment**: 36 trillion Btu (25%)  
- **Water Heating**: 147 trillion Btu (25%)  
- **Lighting**: 92 trillion Btu (16%)  
- **Miscellaneous**: 80 trillion Btu (14%)  
- **Other**: 77 trillion Btu (23%)

* Other includes cooking (28 trillion Btu), cooling (28 trillion Btu), ventilation (17 trillion Btu), and refrigeration (11 trillion Btu).

Approach to the Greenhouse Gas Assessment

• Review calculators & databases
  – Used EPA Greenhouse Gas Conversion Calculator to determine current emission levels
• Determine appropriate data (2008)
  – Electricity and water use
  – Steam Use
  – Natural gas, oil and diesel se
  – Air and car miles
  – Solid waste tonnage
• Site tours and collection of invoices from all seven hospitals
### GHG Assessment Results

<table>
<thead>
<tr>
<th>Location/beds</th>
<th>Total MTCO$_2$e</th>
<th>Equivalent number of passenger vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southdale- 390 beds</td>
<td>33,220</td>
<td>6,160</td>
</tr>
<tr>
<td>Ridges- 150 beds</td>
<td>8,130</td>
<td>1,530</td>
</tr>
<tr>
<td>Lakes- 74 beds</td>
<td>8,030</td>
<td>1,500</td>
</tr>
<tr>
<td>Red Wing- 50 beds</td>
<td>4,790</td>
<td>900</td>
</tr>
<tr>
<td>Range-175 beds</td>
<td>9,980</td>
<td>1,860</td>
</tr>
<tr>
<td>UMMC- 800 beds</td>
<td>84,730</td>
<td>15,690</td>
</tr>
<tr>
<td>Northland- 54 beds</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

- Total MTCO$_2$e $\sim 148,900$
- Total Equivalent Passenger Vehicle GHG Emissions $\sim 27,600$ cars
# Medical & Societal Costs of GHG

<table>
<thead>
<tr>
<th>Location/beds</th>
<th>Direct Medical Costs</th>
<th>Societal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southdale- 390 beds</td>
<td>$209,151</td>
<td>$1,497,164</td>
</tr>
<tr>
<td>Ridges- 150 beds</td>
<td>$103,135</td>
<td>$738,270</td>
</tr>
<tr>
<td>Lakes- 74 beds</td>
<td>$76,522</td>
<td>$547,771</td>
</tr>
<tr>
<td>Red Wing- 50 beds</td>
<td>$50,401</td>
<td>$360,779</td>
</tr>
<tr>
<td>Range-175 beds</td>
<td>$93,245</td>
<td>$667,476</td>
</tr>
<tr>
<td>UMMC- 800 beds</td>
<td>$447,515</td>
<td>$3,203,415</td>
</tr>
<tr>
<td>Northland- 54 beds</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$979,969</strong></td>
<td><strong>$7,014,875</strong></td>
</tr>
</tbody>
</table>
Recommendations

• Switch to reusable surgical and isolation gowns
  – Annual Cost Savings: $199,700
  – Annual Waste Savings: 145,700 lbs (73 tons)

• Reduce amounts of energy usage within hospitals
  – Space and water heating (23% & 26%)
  – Lighting (16%)

• Reduce commuter car and airfare miles for employees
  – Live Meeting for executive green team
  – 500 lbs GHG and $5000.
Personal Benefits

• Gathering job experience in fields related to corporate environmental management
• Problem solving skill development
• Learning to define job expectations and creating a plan of action
• Expanding my personal and professional network
• Sense of accomplishment upon completion of the project
Questions?