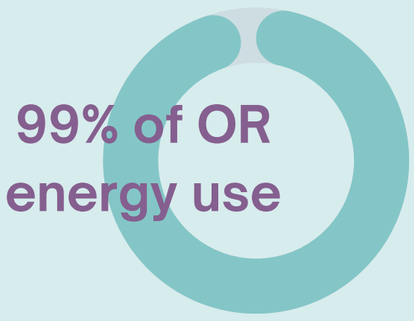
CLIMATE CHANGE & SURGERY
HOT TOPICS

Improving Operating Room HVAC efficiency

Heating, ventilation, and air conditioning (HVAC) systems are responsible for*:



Yet most ORs are <u>not</u> in use for **40%** of the time

There is scope for significant energy and cost saving with more efficient HVAC use

1 UNOCCUPIED SETBACK

REDUCE AIRFLOW...

to each OR when not in use (nights and weekends)

ORs are required to maintain **20** air changes per hour (ACH) when in use, but just **6** ACH when not in use §

STRATEGIES...

for achieving **effective setback** include:

- Placement of occupancy sensors in each OR
- Use of mushroom button
- Automated setback scheduling system

2 OPERATING ROOM SET POINTS

MAINTAIN TEMPERATURE...

between **65** and **72 F**

MAINTAIN RELATIVE HUMIDITY...

between **30** and **60%**

3 RECIRCULATION

Employ air recirculation for systems with capability or those that can be readily retrofitted

This requires capture of anesthetic gases & maintenance of outside air while the OR is in use

4 MONITORING & CALIBRATION

MONITORING

Install continuous local and central temperature, humidity, and relative pressure (OR vs adjacent areas) monitoring

CALIBRATION

Test & verify systems monthly-yearly (system specific) §

Trends can be analyzed to optimise OR enironment control

BARRIERS TO IMPLEMENTATION

Two main barriers

- **Seen as outwith remit of clinical staff**
- **Concerns around clinical safety**

SOLUTIONS TO WIDENING REMIT

Employ multi-disciplinary approach
Including involvement of management and engineering department (biomedical engineers / health systems engineers)

Identify a champion
Ideally a senior member of the team who can act as contact point for other members of the multidisciplinary team

SOLUTIONS TO SAFETY CONCERNS - INCREASE AWARENESS

Surgical site infection
There is no significant difference in bacterial contamination with 6 ACH vs 30 ACH ¶

OR utilisation
It takes just **30mins** from HVAC start up, to achieve acceptable levels of bacteria & airborne particles for operating

BENEFITS

MacNeill et al. achieved a 50% reduction in HVAC energy use with weekend and night time setback in 19 of 22 ORs *

COST SAVINGS

Reducing OR ventilation from 6 ACH to 30 ACH can reduce energy costs by 70% ¥

Combined with other energy saving strategies, hospitals can save on average $125k per year #

COAST

* § ¶ ¥ #

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