“Bright” ideas from Medical Students on Clinical Placements

Topic Area(s)

* Greenhouse gasses: linkages, emissions;
* Estates and facilities (buildings, energy, waste, water);
* Digital transformation;

Please specify your project approach

Mitigation only

Key message / aim

Our aim was to save energy and carbon emissions by reducing the screen brightness of all monitors on an NHS ward and hospital library to 40%. This was achieved in a measurable way, as the decrease in energy (kWh) we measured could be converted exactly to carbon (kg CO2e) savings.

This was done over the course of an 8 week placement block, culminating in presenting our results to consultants across the hospital with the aims of increasing awareness of sustainability in healthcare, incentivising senior doctors to replicate the project at a hospital-wide level and showing that medical students can make impactful steps towards sustainability on placement and inspire staff to do the same.

What was the problem?

The healthcare sector contributes heavily to climate change, producing 4.4% of global carbon emissions. (1) Medical students in the UK are required to engage in Quality Improvement Projects (QIP) and projects that reduce carbon emissions have the potential for financial, environmental and public health benefits. (2)

With the increasing digitisation of healthcare, more electricity will be required to power computers - a major source of carbon emissions. (3) However, computer usage can be optimised to reduce the electricity required to function, particularly reducing screen brightness.

1. Healthcare’s climate footprint [Internet]. 2019 [cited 2024 Jan 21]. Available from: https://www.arup.com/perspectives/publications/research/section/healthcares-climate-footprint

2. GMC. Outcomes 1 - Professional values and behaviours - Patient safety and quality improvement. In: Outcomes for graduates.

3. Powlesland D, Joyce C [Internet]. Neil Davies ; 2021 [cited 2024 Jan 21]. Available from: https://www.gov.wales/sites/default/files/publications/2021-03/nhs-wales-decarbonisation-strategic-delivery-plan.pdf

What was the solution?

We are five final year medical students, supervised by one doctor (DAUK’s sustainability lead).

The only resource we needed was a voltmeter, to measure energy use (kWh) for the computer model used throughout the hospital.

From planning to hospital-wide presentation of results, this project was completed over an eight week clinical placement.

This was a student-led project so there were no staffing requirements.

The only cost to this project was the voltmeter which cost around £10.

What were the challenges?

The aspect of the project staff were most apprehensive about was reducing screen brightness on the screens used to interpret radiology. When discussing our results, this was something doctors of all levels were concerned about, with the belief that reducing screen brightness on any of the screens may impact clinical care.

We overcame this by reassuring staff that we did not change the brightness of the radiology screens. We also conducted a qualitative survey with staff on our ward to quantify the impact on clinical care of reducing brightness on the non-radiology screens and found no members of staff noticed the brightness was turned down. We were also able to reassure staff that the reduced screen brightness would be directly beneficial to them by reducing visual strain/ fatigue, so they were reassured that the benefits outweighed any potential risks.

What helped the intervention implementation/success?

We were fortunate to have the support of doctors of all levels across many departments who were keen to replicate the project on their wards.

The positive culture around sustainability at our placement hospital helped us gain a better understanding of the background to the project - with fortnightly meetings concerning sustainability in healthcare being accessible to students.

Most staff had a very good level of knowledge about climate change and a real interest in their roles both personally and professionally in sustainability - for example many of the consultants drove electric cars to reduce their carbon emissions so were keen to learn how the same could be achieved on their wards.

What were the results/Impact?

Patient outcomes:

There was no impact on patient care - we confirmed this with a qualitative survey on the ward where staff told us none of them noticed the screen brightness had been reduced. We also did not alter the brightness of radiology screens to ensure interpretation of important imaging could not be affected.

Population outcomes:

Reducing carbon footprint will reduce the health effects of carbon emissions- which are both direct effects on humans and indirect via climate change.

An example of a direct health effect of carbon emissions is fossil fuel air pollutants causing and contributing to asthma exacerbations. Indirect examples include: increase in global temperatures causing heat stress and shift in infectious disease epidemiology, rising sea levels causing flooding and frequent, more extreme weather events causing injury and death.

The effects of climate change are disproportionately felt by the most vulnerable and disadvantaged. Therefore these are the groups that will benefit the most from reducing carbon emissions.

Environmental impact:

Carbon saving of 311 kg of CO2e per annum- the equivalent of driving 2,157 kilometres.

Social impact:

We had encouraging verbal feedback from senior doctors, with one representative from Cardiff University Medical School commenting: "Applicable across many settings + very simple change with wide benefits."

Our hope is that the hospital wards which replicate this project will feel a sense of participation in sustainability in healthcare, and that if the project is again led by medical students it will help them feel empowered as a junior and raise their awareness of climate change and the role in which the healthcare system plays in it early on in their careers.

Financial impacts:

Financial saving of £282 per annum.

What were the learning points?

This project was useful for our personal, professional development as learning how to complete an ecoQIP as future doctors, from planning to presentation, helped us develop skills we will surely use throughout our careers in similar sustainability-focused projects.

We learned the value of qualitative opinion surveys to prove how an intervention in a PDSA cycle affects the work of staff and patient care.

The key to our success was making the methods replicable to incentivise staff and other students to complete the initiative on a hospital-wide and trust-wide scale.

We recommend that others planning a similar project use the same covert methodology (i/e do not tell staff on the ward you are planning on reducing the brightness) so they are not subject to bias when asking for their feedback on the effects on clinical work afterwards - if they do report any impact it will therefore then be one they have truly noticed.

Next steps

We have now left the placement hospital, so our clinical supervisor has access to the energy usage we measured using the voltmeter for the specific computer model used in the hospital.

The consultants we presented our results to told us they would be interested in replicating this project across the hospital on their wards, and across the health board.

This project can be applied to any setting where healthcare staff are using computers - ranging from general practice to psychiatry to surgery. It is a truly replicable, versatile project that can be done with no equipment, taking only seconds to reduce the screen brightness per computer.

Feedback

"Applicable across many settings + very simple change with wide benefits."

Want to know more?

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Location & Region:UK - Wales

Partner organisations involved:

* Cardiff University School of Medicine
* Glan Clwyd Hospital - Betsi Cadwaladr University Health Board
* EcoMedics

Has this case study or story been made public in any form before?Yes

Due to present at AMEE conference 2024, pending funding approval from medical school.

Resources and Refereces

1. Healthcare’s climate footprint [Internet]. 2019 [cited 2024 Jan 21]. Available from:

<https://www.arup.com/perspectives/publications/research/section/healthcares-climate-footprint>

1. GMC. Outcomes 1 - Professional values and behaviours - Patient safety and quality improvement. In: Outcomes for graduates.
2. Powlesland D, Joyce C [Internet]. Neil Davies ; 2021 [cited 2024 Jan 21]. Available from: <https://www.gov.wales/sites/default/files/publications/2021-03/nhs-wales-decarbonisation-strategic-delivery-plan.pdf>
3. NHS Wales Decarbonisation Strategic Delivery Plan [Online] Available at: <https://www.gov.wales/publications> [Accessed: 1 November 2023a].
4. EcoMedics drive with computer brightness QIP template:

<https://drive.google.com/drive/folders/1gehEDCe_Tb0tuevHLHaS6GBzEZO0ryN8?usp=sharing>