



Chatbot as a method for socially sustainable mental health care

Kuosmanen, L., Nieminen, H., Vartiainen, A-K., Kostenius, C., Malcolm, M., Potts, C., Bond, RR., & Mulvenna, M. (2021). *Chatbot as a method for socially sustainable mental health care*. 1-2. Abstract from Sustainable Healthcare Academic Research and Enterprise

[Link to publication record in Ulster University Research Portal](#)

Publication Status:

Published (in print/issue): 07/05/2021

Document Version

Peer reviewed version

General rights

Copyright for the publications made accessible via Ulster University's Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The Research Portal is Ulster University's institutional repository that provides access to Ulster's research outputs. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact pure-support@ulster.ac.uk.



7 May 2021

[Conference website](#)

Sustainable Healthcare Academic
Research and Enterprise Conference

Abstracts:
Oral presentations



University of Brighton

School of Health Sciences



CENTRE *for*
SUSTAINABLE
HEALTHCARE
inspire • empower • transform



brighton and sussex
medical school

Table of Contents

Oral presentations overview	4
Concurrent session 1	6
Using a global climate change negotiation simulation workshop to build motivation and advocacy skills with students of health disciplines: a pilot study	7
Planetary Health Report Card – Brighton and Sussex Medical School	8
Sustainable healthcare in medical education: the student perspective.....	10
Envirodent: Driving sustainable action and reform in a major UK dental hospital.....	11
Concurrent session 2	12
Nature and nursing: A critical interpretive synthesis.....	13
How can nurses better adopt environmentally sustainable practices within hospitals and contribute to plastic waste reduction	14
Is there need for educating Finnish nurses about climate change and health	15
The Nurses Climate Challenge Europe.....	16
Concurrent session 3	17
Greener inhaler use.....	18
Addressing the carbon footprint of inhalers prescribed to patients discharged from an acute respiratory ward	19
Exploring challenges and opportunities to improve the quality and sustainability of respiratory care in one NHS Trust	20
Oxygen: life-saver, toxic-causer - a retrospective audit.....	22
Concurrent session 4	23
An evidence-based approach to reducing the environmental impact of the operating theatre	24
Comparative analyses on the ecology and health impact of single-use and reuse ureteroscopes.....	26
EYefficiency app: a novel worldwide quality improvement project tool to create sustainable cataract surgery pathways	27
Concurrent session 5	28
Sustainable quality improvement education project	29
Attitudes towards adherence and resistance to healthcare workplace sustainability initiatives	30
Facilitating sustainable consumption in the workplace using an app-based information tool	31

Concurrent session 632

Dumpster diving in the emergency department: Quantity and characteristics of waste at a Level 1 trauma center	33
The gloves are off - safer in our hands: changing glove use at an acute children's Trust	35
Towards plastic-free healthcare in Europe.....	36

Concurrent session 737

One person's trash is another's treasure: our journey to reduce carbon waste and resource loss through appropriate waste disposal	38
Environmental sustainability of intensive care service provision	40
The Royal Devon and Exeter's Green Team experience: reducing nitrous oxide use	42
Sustainability in anaesthesia	43

Concurrent session 844

Singing for wellbeing: A qualitative study comparing how singing can affect women in choirs in the UK and Norway	45
Chatbot as a method for socially sustainable mental health care.....	46
Health for all? An assessment of transparency and labour rights risk in the supply chains of a UK Hospital.....	48
The triple bottom line: European states struggle to see the health benefits from sustainable development.....	49

Concurrent session 950

Climate protection in German ambulatory healthcare	51
Declaring a climate emergency: how a Trust can help incorporate sustainability into its core ethos.....	52
How to get an NHS Trust to Go Green	53
Sustainability Transition Experiments: The case of the health sector.....	54

Oral presentations overview

Each oral presentation will be 7 minutes.

The chair will then facilitate a round-table discussion of questions and comments with the presenters and audience.

The concurrent sessions will also include an online message board for people to share resources and network.

10:35-11:35 - Choose 1 session from 1, 2 or 3:

Session 1	Session 2	Session 3
Medical and dental education	Nursing	Respiratory
<p>Majel McGranahan Using a global climate change negotiation simulation workshop to build motivation and advocacy skills with students of health disciplines</p>	<p>Sarah Howes Nature and nursing: A critical interpretive synthesis</p>	<p>Alfred Ball Greener inhaler use</p>
<p>James Lee and Janani Muruges Planetary Health Report Card – Brighton and Sussex Medical School</p>	<p>Hayley Kenyon How can nurses better adopt environmentally sustainable practices within hospitals and contribute to plastic waste reduction</p>	<p>Bethan Davies Addressing the carbon footprint of inhalers prescribed to patients discharged from an acute respiratory ward</p>
<p>Dhruv Gupta and Lahvanya Shantharam Sustainable healthcare in medical education: the student perspective</p>	<p>Iira Tiitta Is there need for educating Finnish nurses about climate change and health</p>	<p>Katherine Smith Exploring challenges and opportunities to improve the quality and sustainability of respiratory care in one NHS Trust</p>
<p>Arefeh Ahmadifard Envirodent: Driving sustainable action and reform in a major UK dental hospital</p>	<p>Anna Fuhrmann The Nurses Climate Challenge Europe</p>	<p>Charmaine Cuenca Oxygen: life-saver, toxic-causer - a retrospective audit</p>

12:15-13:00 - Choose 1 session from 4, 5, or 6

Session 4	Session 5	Session 6
Surgery	Quality improvement and staff engagement	Reducing plastic and petroleum-based waste
<p>Chantelle Rizan An evidence-based approach to reducing the environmental impact of the operating theatre</p>	<p>Siobhan Parslow-Williams Sustainable quality improvement education project</p>	<p>Sarah Hsu Dumpster diving in the emergency department: Quantity and characteristics of waste at a Level 1 trauma center</p>
<p>Marlene Thöne Comparative analyses on the ecology and health impact of single-use and reuse ureteroscopes</p>	<p>Pranav Jayaraman Attitudes towards adherence and resistance to healthcare workplace sustainability initiatives</p>	<p>Helen Dunn The gloves are off - safer in our hands: changing glove use at an acute children's Trust</p>
<p>Alexander Chiu Eye efficiency app: a novel worldwide quality improvement project tool to create sustainable cataract surgery pathways</p>	<p>Yulia Omer Facilitating sustainable consumption in the workplace using an app-based information tool</p>	<p>Arianna Gamba Towards plastic-free healthcare in Europe</p>

14:15-15:15 - Choose 1 session from 7, 8 or 9

Session 7	Session 8	Session 9
Intensive care and anaesthesia	Social sustainability and sustainable development	Organisational and strategic approaches
<p>Yoshimi Ito and Eleanor Damm One person's trash is another's treasure: our journey to reduce carbon waste and resource loss through appropriate waste disposal</p>	<p>Sarah Andersen Singing for wellbeing: A qualitative study comparing how singing can affect women in choirs in the UK and Norway</p>	<p>Nikolaus C.S. Mezger and Marlene Thöne Climate protection in German ambulatory healthcare</p>
<p>Heather Baid Environmental sustainability of intensive care service provision</p>	<p>Lauri Kuosmanen Chatbot as a method for socially sustainable mental health care</p>	<p>Rosanna Spooner Declaring a climate emergency: how a Trust can help incorporate sustainability into its core ethos</p>
<p>Claire Swarbrick The Royal Devon and Exeter's Green Team experience: reducing nitrous oxide use</p>	<p>Jasmin Abbott Health for all? An assessment of transparency and labour rights risk in the supply chains of a UK Hospital</p>	<p>Nathaniel Duke How to get an NHS Trust to Go Green</p>
<p>Victoria van der Schyff and Pei Jean Ong Sustainability in anaesthesia</p>	<p>Graham Bickler The triple bottom line: European states struggle to see the health benefits from sustainable development</p>	<p>Fiona Miller Sustainability Transition Experiments: The case of the health sector</p>

Concurrent session 1

Medical and dental education

10:35-11:35

Presenter	Title
Majel McGranahan	Using a global climate change negotiation simulation workshop to build motivation and advocacy skills with students of health disciplines: a pilot study
James Lee Janani Muruges	Planetary Health Report Card – Brighton and Sussex Medical School
Dhruv Gupta Lahvanya Shantharam	Sustainable healthcare in medical education: the student perspective
Arefeh Ahmadifard	Envirodent: Driving sustainable action and reform in a major UK dental hospital

Using a global climate change negotiation simulation workshop to build motivation and advocacy skills with students of health disciplines: a pilot study

Abstract author, designation, institution and contact email

Dr Majel McGranahan

Public Health Specialty Registrar, University of Warwick

majel.mcgranahan@nhs.net

Co-author name(s), designation and institution

Abstract

Aims/objectives

In 2020, Glasgow will host the 26th UN global climate negotiations. Health advocacy is essential, locally and globally, both to avoid the health impacts of climate change and to maximise the benefits to health of mitigation. In recognition of this, many health professional bodies have incorporated sustainability into their education standards. However, research suggests medical educators often do not feel confident teaching sustainability.

Methods

The World Climate Interactive (WCI) exercise, created by the thinktank Climate Interactive™, offers the opportunity to role-play different regions of the world in global climate negotiations. Participants are grouped by country or region and briefed, and then enter into two rounds of negotiations. Each region seeks to establish what pledges they will make to emissions reduction, reforestation, and the Global Climate Fund. At the end of each round, each region's pledges are entered into software, *c-roads*, which models the emissions pathway that the commitments will lead to and the consequent global warming.

Results

We piloted the exercise with ten facilitators with no specialist knowledge of climate change, and three student cohorts of health-related disciplines. A qualitative evaluation explored whether WCI provides an effective and accessible tool to support sustainable healthcare related learning outcomes.

Discussion and relevance to / impact on the triple bottom line

Using thematic analysis of data collected we found the exercise:

1. Generated a deeper understanding of urgency and the need for a global approach.
2. Generated motivation to act for both students and facilitators.
3. Provided an opportunity to develop negotiation skills.
4. Was an accessible teaching tool for facilitators with no specialist knowledge of climate change.

Planetary Health Report Card – Brighton and Sussex Medical School

Abstract author, designation, institution and contact email
James Lee and Janani Murugesh 3rd Year Medical Students, Brighton and Sussex Medical School j.lee3@uni.bsms.ac.uk and j.murugesh1@bsms.ac.uk
Co-author name(s), designation and institution
Blair Chen , 1st Year Medical Student, Brighton and Sussex Medical School Pratibha Srikanthan , 1st Year Medical Student, Brighton and Sussex Medical School Jeremiah Samkutty , 1st Year Medical Student, Brighton and Sussex Medical School Nailah Akhtar , 1st Year Medical Student, Brighton and Sussex Medical School Maria Barbot , 2nd Year Medical Student, Brighton and Sussex Medical School Francisca Marsh , 2nd Year Medical Student, Brighton and Sussex Medical School Kathy Bog , 2nd Year Medical Student, Brighton and Sussex Medical School James Slaven , 2nd Year Medical Student, Brighton and Sussex Medical School James Chu , 3rd Year Medical Student, Brighton and Sussex Medical School Olivia Thompson , 3rd Year Medical Student, Brighton and Sussex Medical School Holly Morley , 3rd Year Medical Student, Brighton and Sussex Medical School Jordache Ellis , 3rd Year Medical Student, Brighton and Sussex Medical School Shaily Mehta , 5th Year Medical Student, Brighton and Sussex Medical School
Abstract
Aims/objectives The Planetary Health Report Card (PHRC) is a student led international initiative to inspire the development of planetary health and sustainable healthcare education within medical schools. We present here the report for Brighton and Sussex Medical School (BSMS).
Methods The report assesses 5 sections: Curriculum, Interdisciplinary research, Community outreach, Campus sustainability and Support for student led initiatives. We assessed all taught content in the undergraduate course at BSMS from the academic year 2019/20 using the PHRC framework made up of numerical metrics. Additionally, for

other sections we sourced evidence from publicly available sources as well as support from various members of faculty

Results:

Curriculum: 36/58 = 62% (B)

Research: 15/19 = 79% (B)

Community: 2/12 = 25% (D)

Support for Student initiatives: 9/15 = 60% (B)

Campus sustainability: 18/29 = 62% (B)

Total = 81/133 = 61%

Overall Grade: B

Discussion

The report has highlighted the work already being done by BSMS to include planetary health teaching within the curriculum. The report has identified the following key areas for improvement with specific recommendations to be made on completion: Community engagement, student representation and building on current planetary health teaching.

Relevance to / impact on the triple bottom line:

We hope to work with the faculty to implement our recommendations, developing the planetary health and sustainable healthcare education at BSMS.

Sustainable healthcare in medical education: the student perspective

Abstract author, designation, institution and contact email
Dhruv Gupta and Lahvanya Shantharam St George's, University of London dgupta2498@gmail.com
Co-author name(s), designation and institution
Dr Bridget Kathryn MacDonald , Consultant Neurologist, St George's Hospital
Abstract
Aims/objectives To identify: <ul style="list-style-type: none">• Whether current medical students have been taught what sustainable healthcare (SH) is.• Whether current SH teaching (SHT) is sufficiently incorporated into the medical curriculum.• The importance of SH from the perspective of current medical students.• Preferred approaches to include SHT in the medical curriculum.
Methods A questionnaire was circulated to clinical year medical students and students intercalating after completing at least one clinical year in a London university.
Results 163 students completed the questionnaire. 93% believed that climate change is a concern in current society, but only 1.8% thought they had been formally taught what SH is. 3.1% felt they would be confident answering SH-related exam questions, and 89% agreed more SHT is needed.
Discussion Our study identified a lack of SHT in the medical curriculum, reiterating previous literature. A lack of academics educated in SH medical education has previously been suggested. Using shared online resources across medical schools may provide a solution to this.

Envirodent: Driving sustainable action and reform in a major UK dental hospital

Abstract author, designation, institution and contact email
Arefeh Ahmadifard Final Year Dental Student, Barts and the London Dental School a.ahmadifard@smd16.qmul.ac.uk
Co-author name(s), designation and institution
Dr Zahra Shehabi , Consultant in Special Care Dentistry, Barts Health NHS Trust Dr Claire Morgan , Consultant in Restorative Dentistry, Barts Health NHS Trust
Abstract
Aims / objectives To evaluate <ul style="list-style-type: none">• Staff and student awareness and knowledge of sustainability issues in the provision of oral healthcare.• The effectiveness of educational campaigns in driving sustainable behaviour• The effectiveness of waste streams and segregation in a major UK dental hospital.
Methods Mixed method approach involving survey issued to staff and students at The Royal London Dental Hospital, dissemination of an educational campaign using, bin audits, clinic observation and a cost analysis.
Results Preliminary results showed that staff/students felt sustainable changes were necessary. Educational campaigns have shown some improvement in attitude and behaviour. Bin audits and clinic observation revealed improvements to waste segregations and PPE use are required whilst survey responses indicated improvements in sustainable non-clinical practices are necessary.
Discussion There are several barriers to sustainable reform within the Dental Hospital: lack of education; ineffective waste segregation; and the financial accessibility of ecologically harmful materials such as single use plastics. Educational campaigns are key, though will require continuous reinforcement to realise benefit.
Relevance to / impact on the triple bottom line Effective waste segregation and appropriate PPE use are vital financially and in reducing the environmental impacts of waste production. Effective educational campaigns underpin important cultural shifts in institutions.

Concurrent session 2

Nursing

10:35-11:35

Presenter	Title
Sarah Howes	Nature and nursing: A critical interpretive synthesis
Hayley Kenyon	How can nurses better adopt environmentally sustainable practices within hospitals and contribute to plastic waste reduction
Iira Tiitta	Is there need for educating Finnish nurses about climate change and health
Anna Fuhrmann	The Nurses Climate Challenge Europe

Nature and nursing: A critical interpretive synthesis

Abstract author, designation, institution and contact email
Sarah Howes PhD Student and Lecturer in Mental Health Nursing, University of Plymouth sarah.howes@plymouth.ac.uk
Co-author name(s), designation and institution
Abstract
Aims / objectives <ul style="list-style-type: none">• Examine the relevance and impact of nature immersion as a reflective wellbeing strategy within nurse education.• Address the paucity of research examining the nurse-nature relationship.• Explore the lived experience of nature immersion for student nurses, increasing opportunity for inclusion within curricula.
Methods <p>Interdisciplinary searching identified an extensive body of literature with significant heterogeneity. Critical Interpretive Synthesis was utilised to identify a representative sampling frame, enabling interpretation whilst problematizing the literature.</p>
Results <p>Findings identify nature as potentially therapeutic with capacity to:</p> <ol style="list-style-type: none">i) Increase positive affectii) Decrease negative affectiii) Offer a sense of belongingiv) Promote meaning makingv) Foster an interest in caring for the natural world. <p>Despite this, the emerging picture is problematic and identifies the ongoing impacts of colonialism for people, planet and the research itself.</p>
Discussion <p>Findings may be transferrable to a nursing context, with further study exploring the complex social factors influencing the relationship between nature and wellbeing from a nurse education perspective.</p>
Relevance to / impact on the triple bottom line <ul style="list-style-type: none">• Environmental – Mutuality of human-planetary caring relationships.• Financial – Stress & burnout – impact on attrition and recruitment.• Social – Sustainability of people and planet, colonialism and gender in the literature.

How can nurses better adopt environmentally sustainable practices within hospitals and contribute to plastic waste reduction

Abstract author, designation, institution and contact email
Hayley Kenyon Staff Nurse, Royal Alexandra Children's Hospital, Brighton hayley-ann.kenyon@nhs.net
Co-author name(s), designation and institution
Kris Fernandes , Senior Lecturer, School of Health Sciences, University of Brighton
Abstract
Aim/objectives To analyse the current literature identifying environmental practices conducted within hospitals and recommend actions for future practice.
Methods Literature review.
Findings The critical appraisal of the literature, revealed that established sustainable practices were apparent internationally. However, three themes indicating the challenges to implementing environmentally-friendly practices within a hospital, arose. These are: <ul style="list-style-type: none">• Current implemented environmentally sustainable practices• Plastic waste reduction and management• Barriers to environmentally sustainable practices.
Discussion Nurses and healthcare practitioners face a multitude of challenges in tackling the environmental impacts of nursing processes. Current sustainable practices are evident globally, however, implementing improvements requires change on an individual and institutional level. Where much improvement is required, sufficient education and awareness training, empowering nurses and practitioners to become advocates for sustainability, and introducing sustainability awareness in to pre-registration education is a starting point. From this, holistic patient care, that considers not only the individual patient but population health and environmental sustainability, can be developed.
Relevance to / impact on the triple bottom line Based on the findings extracted from the evidence, the following recommendations have been created for healthcare and nursing practice improvement: <ul style="list-style-type: none">• Mandatory training and education for all nurses and health care professionals regarding environmental sustainability practices.• Mandatory inclusion of an environmental sustainability module as a requirement in student nursing education.• The provision "sustainability advocates" and sustainability teams, within each hospital department.• Daily recycling waste checks, labelling and monitoring within operating theatres.

Is there need for educating Finnish nurses about climate change and health

Abstract author, designation, institution and contact email
lira Tiitta PhD Student, University of Eastern Finland lira.tiitta@uef.fi
Co-author name(s), designation and institution
Dr McDermott-Levy, Ruth , Associate Professor and Director of the Center for Global and Public Health, Villanova University, College of Nursing, Villanova PA, USA Prof Turunen, Hannele , Professor and Head of the Department, Department of Nursing Science, University of Eastern Finland, Kuopio Finland Prof Jaakkola, Jouni , Professor and Director of Center for Environmental and Respiratory Health Research (CERH), Faculty of Medicine, University of Oulu, Oulu Finland Dr Kuosmanen Lauri , Adjunct Professor, Department of Nursing Science, University of Eastern Finland, Kuopio Finland
Abstract
Aims / objectives Aim of the study was to find out how prepared Finnish registered nurses are to deal with the health effects of climate change.
Methods A qualitative descriptive study was conducted in November 2018 using focus group interviews to collect data.
Results Interviews revealed that nurses have observed many of the health impacts caused by climate change in their patients. However, they had not linked their observed changes in patients' health to climate change. Interviewed registered nurses appeared to be unaware of the specific health effects of climate change.
Discussion There is clear need to add knowledge about climate change and its health effects in to nursing education Finland. Education would strengthen the competence of nurses in helping their patients prevent and reduce the health impacts caused by climate change.
Relevance to / impact on the triple bottom line This research is relevant to improve nursing education in Finland. With education about climate change it also helps to improve nursing staff to work in more sustainable ways.

The Nurses Climate Challenge Europe

Abstract author, designation, institution and contact email
Anna Fuhrmann Climate Officer, Health Care Without Harm (HCWH) Europe anna.fuhrmann@hcwh.org
Co-author name(s), designation and institution
Abstract
Aims / objectives The Nurses Climate Challenge Europe was launched by HCWH Europe in January 2021 to build a network and foster a movement of informed and more engaged health professionals committed to climate solutions in care settings and the community.
Methods Nurses that sign up for the Challenge get access to a free, comprehensive, and ever-growing set of easy-to-use resources to educate themselves and their colleagues about the impacts of climate on health. Nurses can use these materials to host educational events and report back on the number of health professionals they have educated as part of the challenge. Additionally, HCWH Europe is working with a small group of leading European nursing schools to develop the Nursing School Commitment. This aims to firmly root climate change and environmental health in the nursing curricula across Europe, and it will be available for all nursing schools across Europe to join.
Results The Nurses Climate Challenge Europe aims to emulate the success of its US counterpart, which has seen over 18,000 US nurses educated since its launch in 2018.
Discussion By providing access to the necessary resources, it supports nurses in educating their colleagues on the relevance of climate change for health and ways to mitigate and build resilience in their daily practice.
Relevance to / impact on the triple bottom line This initiative holds potential to build a truly global movement among the nursing community for improving environmental sustainability.

Concurrent session 3

Respiratory

10:35-11:35

Presenter	Title
Alfred Ball	Greener inhaler use
Bethan Davies	Addressing the carbon footprint of inhalers prescribed to patients discharged from an acute respiratory ward
Katherine Smith	Exploring challenges and opportunities to improve the quality and sustainability of respiratory care in one NHS Trust
Charmaine Cuenca	Oxygen: life-saver, toxic-causer - a retrospective audit

Greener inhaler use

Abstract author, designation, institution and contact email
Dr Alfred Ball Foundation Y1 doctor, Newham University Hospital Alfred.ball1@nhs.net
Co-author name(s), designation and institution
Abstract
Aims/objectives <ul style="list-style-type: none">• Understand the carbon footprints of different types of inhalers• Assess inhaler prescription patterns at Newham University Hospital (NUH)• Discover cost-effective and 'green' inhaler swaps• Evaluate the impact of inhalers on the NHS carbon footprint
Methods <p>Inhaler prescriptions from NUH were gathered over 12 months. Prices of individual inhalers were calculated and cost-effective swaps identified. Information was taken from papers discussing inhaler prescriptions and subsequent environmental impact.</p>
Results <p>The carbon footprint of metered dose inhalers (MDIs) equates to 500g CO₂-equivalent per dose, compared to 20g CO₂-equivalent per dose for dry powder inhalers (DPIs). In 2011, 70% of inhalers prescribed in the UK were MDIs. From July 2018-June 2019 at NUH, 42% of inhalers prescribed were MDIs. In Scandinavia and other parts of Europe, rates are only 10%.</p>
Discussion <p>'Green' swaps were identified as:</p> <ul style="list-style-type: none">• Clenil MDI to Pulmicort Turbohaler• Fostair MDI to Fostair Nexthaler• Seretide Evohaler to Seretide Accuhaler <p>The NHS accounts for 3% of UK emissions, MDIs contribute to 3.9% of the carbon footprint of the NHS.</p>
Relevance to / impact on the triple bottom line <p>MDIs contribute heavily to the carbon footprint of the NHS. Despite similarly priced, greener alternatives being available, patients remain on MDI therapy. Safely changing patients' inhalers could have a significant environmental impact.</p>

Addressing the carbon footprint of inhalers prescribed to patients discharged from an acute respiratory ward

Abstract author, designation, institution and contact email
Dr Bethan Davies Chief SpR Medicine, Brighton and Sussex University Hospitals NHS Trust bethan.davies10@nhs.net
Co-author name(s), designation and institution
Dr Anna Jevons , FY2, Brighton and Sussex University Hospitals NHS Trust
Abstract
Aims / objectives Identify the proportion of metered dose inhalers (MDIs) prescribed to patients discharged from a respiratory ward compared with low carbon alternatives (mainly dry powder inhalers, DPIs). Estimate potential carbon savings (measured in mass of carbon dioxide equivalent, CO ₂ e) and cost impact of switching MDIs to DPIs.
Methods Patients identified from hospital coding. Discharge summaries reviewed for inhaler details. Estimated CO ₂ e for each inhaler obtained from existing literature.
Results 169 patients and 321 inhaler prescriptions included. MDI prescription rate 63%. Estimated carbon footprint of inhaler use over 1 year 23673 kgCO ₂ e. Switching MDIs to DPIs could reduce this by 21381 kgCO ₂ e (equivalent of driving 123,000km), and could be cost-neutral or have cost savings
Discussion Although clinical need remains paramount, trust policy should be developed to consider environmental impact alongside patient choice and cost when prescribing inhalers. We recommend discontinuing prescription of inhalers containing the propellant HFA227ea, considering switching MDIs to DPIs in patients already on combined inhaler delivery methods (25% in this group) and making DPIs first choice for new prescriptions.
Relevance to / impact on the triple bottom line Reduction in release of greenhouse gases from MDI use Opportunity to review inhaler technique with potential improvement in clinical outcomes Potential cost savings plus long-term financial benefits from improved patient and planetary health.

Exploring challenges and opportunities to improve the quality and sustainability of respiratory care in one NHS Trust

Abstract author, designation, institution and contact email
<p>Dr Katherine Smith Trust Doctor, formerly Newcastle upon Tyne Hospitals NHS Foundation Trust katherine.smith26@nhs.net</p>
Co-author name(s), designation and institution
<p>Dr Sarah C Walpole, ST4 Infectious Diseases / General Internal Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Jill Taylor, Respiratory Pharmacist, Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Joseph McElvaney, Medical Student, Newcastle University</p> <p>Alice Fitzpatrick, Physician Assistant, formerly Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Dr Adam Potts, Trust Doctor, formerly Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Dr Kate Moffatt, Trust Doctor in Care of the Elderly, Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Dr Simon Doe, Consultant in Respiratory Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Dr Hilary Tedd, Consultant in Respiratory Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust</p> <p>Dr Graham Burns, Consultant in Respiratory Medicine, Newcastle upon Tyne Hospitals NHS Foundation Trust</p>
Abstract
<p>Aims / objectives To identify opportunities to improve the quality of respiratory care in a UK hospital.</p> <p>Methods We developed a survey to assess prescriber knowledge of inhalers and their environmental impacts. We disseminated the survey to secondary care prescribers.</p> <p>We developed a tool to assess patients' inhaler technique, preferences, and regular prescriptions. We surveyed patients on a respiratory ward over six weeks.</p>

Results

Of 102 secondary care prescribers, the median score was 8/12 for knowledge of inhaler contents and devices. 46% would educate patients about the environmental impact of inhalers if provided with education and support. We surveyed 20 inpatients. 100% were prescribed both an MDI and a DPI. Most did not demonstrate correct MDI technique. 16/20 would be willing to change inhaler for one with a lower carbon footprint.

Discussion

This project highlights opportunities to support selection of more environmental inhaler options. Limitations include lack of validated scales and small sample sizes.

Relevance to / impact on the triple bottom line

Inhalers contribute over 3% of the NHS's carbon footprint. MDIs have over 10 times the footprint of DPIs. An overall cost saving can also be achieved by a wholesale change to DPIs.

Oxygen: life-saver, toxic-causer - a retrospective audit

Abstract author, designation, institution and contact email
Charmaine Marie Cuenca Staff Nurse, Brighton and Sussex University Hospitals, NHS Trust charmaine.cuenca@nhs.net
Co-author name(s), designation and institution
Abstract
Aims/objectives To review oxygen therapy weaning practices by nurses in one post-operative cardiac surgery intensive care unit to determine the extent of hyperoxaemia from excessive oxygen delivery. Hyperoxaemia not only causes harmful clinical effects to the patient, but also increases financial cost and environmental waste from unnecessary use of hospital supplies (oxygen, syringes for arterial blood gas sampling, testing equipment and packaging).
Methods A retrospective audit was conducted using 144 arterial blood gases of post-cardiac surgery adults with PaO ₂ >13.3kPa during January-March 2019. It was then determined whether staff weaned oxygen support within 30 minutes if the patient was clinically ready for reducing the oxygen. Persistent hyperoxaemia was classified according to severity.
Results 34 arterial blood gases (23.6%) were weaned appropriately and 110 (76.4%) were not. Severity of hyperoxaemia: Mild=94 (85.5%), Moderate=12 (10.9%) and Severe=4 (3.6%).
Discussion This project demonstrated that the majority of patients in a cardiac surgery intensive care unit were over-oxygenated which increased the risk of clinical harm from hyperoxaemia and showed there is potential to reduce unnecessary financial cost and carbon footprint from improved oxygen weaning. Increased awareness of the clinical and environmental impact of hyperoxaemia can significantly change the culture influencing oxygen administration, leading towards more sustainable practices by staff who make decisions about when and how to wean oxygen.
Relevance to / impact on the triple bottom line Weaning oxygen therapy is relevant for improving both clinical and sustainability outcomes. Avoiding unnecessary use of oxygen can reduce oxygen waste and promote a more sustainable approach to oxygen therapy.

Concurrent session 4

Surgery

12:15-13:00

Presenter	Title
Chantelle Rizan	Optimising the carbon footprint of operative waste
Marlene Thöne	Comparative analyses on the ecology and health impact of single-use and reuse ureteroscopes
Alexander Chiu	Eyefficiency app: a novel worldwide quality improvement project tool to create sustainable cataract surgery pathways

An evidence-based approach to reducing the environmental impact of the operating theatre

Abstract author, designation, institution and contact email

Miss Chantelle Rizan

ENT Research Fellow, Brighton & Sussex University Hospitals NHS Trust
Surgical Research Fellow, Royal College of Surgeons of England
Sustainable Surgery Fellow, Centre for Sustainable Healthcare
Honorary Clinical Teaching Fellow and PhD Student, Brighton & Sussex Medical School
chantelle.rizan@nhs.net

Co-author name(s), designation and institution

Dr Rob Lillywhite, Associate Professor, Department of Life Sciences, University of Warwick

Prof Malcolm Reed, Dean and Professor of Surgical Oncology, Brighton and Sussex Medical School

Prof Mahmood F Bhutta, Consultant ENT Surgeon, Brighton and Sussex University Hospitals NHS Trust

Abstract

Aims/objectives

Operating theatres are a major area of resource consumption and here we provide an evidence-based approach for moving towards net zero carbon surgery.

Methods

The presentation will focus on evidence-based mechanisms by which the environmental impact of operating theatres can be theoretically reduced, drawing upon our original research in this field.

Results

We propose the following sustainable surgery principles hierarchy:

- a. REDUCE
 - i. Reduce need for operations and treatment of their complications through promoting surgical disease prevention and peri-operative optimisation
 - ii. Focusing on operations with greatest clinical efficacy (minimising 'low value' surgery)
 - iii. Streamlining surgical patient pathways and associated process
 - iv. Reducing use of unnecessary consumables
- b. REUSE
 - v. Shifting to reusable surgical equipment, identifying need enterprise
 - vi. Increasing lifespan of reusables through repair and maintenance
 - vii. Where reusables not possible, exploring hybrid (reusable/single-use items), remanufacture of single-use
- c. RECYCLE
 - viii. Increase rates of recycling
 - ix. increase recycled content of surgical consumables

x. Where recycling not possible, use of low carbon waste processing

Discussion

Meeting net zero surgery within surgery poses a major challenge, and we will need to take a collaborative approach in achieving this, including engagement with industry, supporting services, and policy makers.

Relevance to / impact on the triple bottom line

This analysis focuses on reducing environmental impact of surgery, highlighting where this aligns with financial savings.

Comparative analyses on the ecology and health impact of single-use and reuse ureteroscopes

Abstract author, designation, institution and contact email
Dr Marlene Thöne PhD Student, Universitätsklinik Tübingen, Germany marlene.thoene@gmx.de
Co-author name(s), designation and institution
Abstract
Aims / objectives To evaluate and compare the Life Cycle Analysis and health effects of single-use instruments and reusable devices in urology.
Methods Life Cycle Assessment of single-use and reuse ureterorenoscopes to evaluate Global Warming Potential & Human Health Impact.
Results First estimates will be available in Spring 2021.
Discussion Are Life Cycle Assessments a practical method of studying the environmental and health impact of single-use vs reuse devices in urology?
Relevance to / impact on the triple bottom line Waste plays a big role in climate change. The health care sector in Germany contributes to 5% of greenhouse gas emissions. Thus, medical services have to evaluate their footprint and the effects of climate change on human health. There have not been any comparable urological studies in Germany/Europe yet.

Eyefficiency app: a novel worldwide quality improvement project tool to create sustainable cataract surgery pathways

Abstract author, designation, institution and contact email

Dr Alexander Chiu

ST6 Ophthalmology Trainee, Aneurin Bevan University Health Board, Wales
achiu@nhs.net

Co-author name(s), designation and institution

Ingeborg Steinbach, Finance Director and Carbon Consultant, Centre for Sustainable Healthcare

Mr Daniel Morris, Consultant Ophthalmologist, Cardiff and Vale University Health Board

Abstract

Aims/objectives

Currently worldwide healthcare contributes to 2 Gt CO₂eq (5% of total world carbon footprint per year). Cataract removal is the most common surgery in the world, however the carbon footprint and treatment pathways vary from different units. The Eyefficiency app has been developed and trialed worldwide as a quality improvement project tool to analyse carbon footprint of cataract surgery. We present our data from five units in Wales, UK illustrating the carbon footprint of cataract surgery.

Methods

We used the eyefficiency app in five units in Wales, UK. This is a component analysis study of carbon footprint of cataract surgery. Activity data was collected from three sectors, building and energy use, travel and procurement. Published emissions factors were applied to this data to provide figures in carbon dioxide equivalents (CO₂eq).

Results

The carbon footprint for one cataract operation was 121.8 kg CO₂eq. The associated carbon footprint is 405.4 tonnes CO₂eq. We demonstrate the eyefficiency app for measuring carbon footprint of cataract surgery and compare data from around the world.

Relevance to / impact on the triple bottom line

This is the first published carbon footprint series of cataract surgery and acts as a benchmark for other studies as well as identifying areas for emissions reduction.

Concurrent session 5

Quality improvement and staff engagement

12:15-13:00

Presenter	Title
Siobhan Parslow-Williams	Sustainable quality improvement education project
Pranav Jayaraman	Attitudes towards adherence and resistance to healthcare workplace sustainability initiatives
Yulia Omer	Facilitating sustainable consumption in the workplace using an app-based information tool

Sustainable quality improvement education project

Abstract author, designation, institution and contact email
Siobhan Parslow-Williams QI Education Lead, Centre for Sustainable Healthcare Siobhan.parslow-williams@sustainablehealthcare.org.uk
Co-author name(s), designation and institution
Dr Frances Mortimer , Medical Director, Centre for Sustainable Healthcare Dr Rosie Spooner , QI Education Fellow, Centre for Sustainable Healthcare
Abstract
Aims / objectives The Centre for Sustainable Healthcare (CSH) has developed the Sustainability in Quality Improvement (SusQI) Framework to equip health professionals to innovate for a more environmentally, socially and financially sustainable health service. The project's primary aim is to integrate sustainability into current QI teaching in order to improve the knowledge and skills required for sustainable healthcare.
Methods 13 pilot sites were set up in 2019/2020 to demonstrate the inclusion of SusQI in health professions education on QI. A mixed methods survey has been conducted post-teaching and focus groups are planned with students and educators.
Results Results from the project are currently being analysed and will be presented at the conference. An initial evaluation from one pilot site concluded that the workshop and resources were successful in building motivation and skills, and in reframing thinking on SusQI. 91.7% of medical students reported it was important for sustainable healthcare and QI teaching to be part of the core curriculum.
Discussion The SusQI framework offers a practical way for all healthcare professionals to create incremental change towards a more ethical, sustainable healthcare system.
Relevance to / impact on the triple bottom line The SusQI framework is an approach to improving healthcare holistically using the triple bottom line to measure sustainable value.

Attitudes towards adherence and resistance to healthcare workplace sustainability initiatives

Abstract author, designation, institution and contact email
<p>Pranav Jayaraman Graduate Student Assistant, University Health Services, The University of Texas at Austin J0302490@gmail.com</p>
Co-author name(s), designation and institution
<p>Katherine Mosteller, Associate Director of Nursing Services and Clinical Operations, University Health Services, University of Texas at Austin</p>
Abstract
<p>Aims / Objectives This study seeks to understand University Health Services clinical staff's barriers to adherence to clinical waste disposal protocol, attitudes towards sustainability, and aspects of current initiatives, such as signage, bins, training, and support for future potential directions.</p> <p>Methods An anonymized survey was conducted (n= 83) with Likert scale and free-response questions. Survey insights were compiled into a fishbone cause-and-effect diagram.</p> <p>Results The survey revealed while staff had very favorable attitudes towards sustainability (\bar{x}= 4.67, 96.8% favorable) and non-terminal waste options, the primary concern expressed was sustainability tasks would hinder clinical efficiency. Receptivity to educational training modules and the use of alternate-sustainable materials in clinical operations was also indicated.</p> <p>Discussion These results show that contamination is not necessarily due to indifference to sustainability measures but instead related to logistical and knowledge barriers. Understanding these factors/priorities can inform approaches when implementing and obtaining buy-in for future healthcare sustainability initiatives.</p> <p>Relevance to / impact on the triple bottom line Survey responses suggest while training can lessen downstream contamination, initiatives that reduce waste from clinical care itself such as telehealth and removing non-value-added steps can better mitigate healthcare's detrimental environmental effects. This approach also reduces unnecessary healthcare costs, contamination-rate related fines, and makes clinical waste disposal less staff intensive, allowing staff to focus on patient care.</p>

Facilitating sustainable consumption in the workplace using an app-based information tool

Abstract author, designation, institution and contact email
<p>Yulia Omer Sustainability Researcher and PhD Student, University of Surrey and Hampshire Hospitals NHS Foundation Trust y.omer@surrey.ac.uk yulia.omer@hhft.nhs.uk</p>
Co-author name(s), designation and institution
Abstract
<p>Aims/objectives Social and behaviour change strategies play an important role in achieving triple bottom line in sustainable development in healthcare sector. Many healthcare professionals want to make their everyday working practices more sustainable but lack the opportunity (e.g. physical structure or governance barriers) or the knowledge of practical examples that apply in their specific context. This presentation aims to address the latter issue by presenting a prototype of an interactive app, containing customisable bite-size information of everyday sustainability actions for healthcare staff.</p> <p>Methods The app is developed based on the outcomes of a doctoral research project on sustainable everyday consumption in acute hospitals.</p> <p>Results At present, the app covers areas of everyday consumables and energy use. The information can be tailored to occupation / department / area of consumption / ease of implementation.</p> <p>Discussion Each entry contains a short explanation of its environmental impact, examples of actions to improve sustainability and weblinks to evidence in a form of case studies and academic articles.</p> <p>Relevance to / impact on the triple bottom line The environmental improvements are the focus of the app. However, other positive outcomes of the initiatives are also highlighted in the descriptions, such as social, economic and quality improvement co-benefits.</p>

Concurrent session 6

Reducing plastic and petroleum-based waste

12:15-13:00

Presenter	Title
Sarah Hsu	Dumpster diving in the emergency department: Quantity and characteristics of waste at a Level 1 trauma center
Helen Dunn	The gloves are off - safer in our hands: changing glove use at an acute children's Trust
Arianna Gamba	Towards plastic-free healthcare in Europe

Dumpster diving in the emergency department: Quantity and characteristics of waste at a Level 1 trauma center

Abstract author, designation, institution and contact email
<p>Sarah Hsu Medical student, Warren Alpert Medical School of Brown University, Providence, Rhode Island, USA Sarah_Hsu@brown.edu</p>
Co-author name(s), designation and institution
<p>Dr Cassandra Thiel, Assistant Professor, Department of Population Health, NYU Langone Health, New York University, New York, New York, USA</p> <p>Prof Michael J. Mello, Professor of Emergency Medicine, Warren Alpert Medical School of Brown University, Providence, Rhode Island, USA</p> <p>Dr Jonathan E. Slutzman, Director of Center for the Environment and Health and Medical Director for Sustainability, Massachusetts General Hospital; Instructor in Emergency Medicine, Harvard Medical School, Boston, MA, USA</p>
Abstract
<p>Aims / objectives The purpose of this study was to quantify and describe the amount of waste generated by an emergency department (ED), identify deviations from waste policy, and explore areas for waste reduction in the ED.</p> <p>Methods A 24-hour (weekday) ED waste audit was conducted in an urban, tertiary-care academic medical center. Deviations from hospital waste policy were also tracked using the hospital's Infection Control Manual, state regulations, and HIPAA standards. Lastly, direct pollutant emissions from ED waste disposal activities were calculated using the M+WasteCare Calculator.</p> <p>Results The ED generated the following during the 24-hour collection period:</p> <ul style="list-style-type: none">• 671.8 kg total waste.• 1.99 kg / patient encounter.• 64.6% was plastic and 18.4% paper-derived products.• 200 unused items.• 14.9% of waste in red bags met criteria for regulated medical waste.• Other deviations from policy included loose sharps not placed in sharps containers, as well as re-processable items and Protected Health Information thrown in medical and solid waste.• Pollutant emissions / day = 3,110 kg CO₂e and 576 g of other criteria pollutants, heavy metals, and toxins.

Discussion

The ED generated significant amounts of waste. While the results will likely be similar to other urban tertiary EDs, future studies are needed across EDs with different patient volumes or waste generation rates.

Relevance to / impact on the triple bottom line

Current disposal practices revealed several opportunities to reduce total waste, increase adherence to waste policy, and reduce environmental impact.

The gloves are off - safer in our hands: changing glove use at an acute children's Trust

Abstract author, designation, institution and contact email
Helen Dunn Consultant Nurse Infection Prevention & Control and Director of Infection Prevention & Control, Great Ormond Street Hospital, London Helen.Dunn@gosh.nhs.uk
Co-author name(s), designation and institution
Nicola Wilson , Lead Practice Educator, Great Ormond Street Hospital, London Amy Leonard , Head of Digital Learning, Great Ormond Street Hospital, London
Abstract
Aims/objectives This improvement project aimed to reduce unnecessary non-sterile glove use.
Methods A working group with staff from across the organisation was led by the Lead Practice Educators in conjunction with the IPC team to create an educational awareness programme. In the first stage, staff risk assessed when they needed to wear gloves, particularly focusing on when giving medication. Gloves were only needed for: <ul style="list-style-type: none">• Any medication where you could be in contact with a bodily fluid. e.g. eye drops, nose drops• Any therapeutically active cream• Any liquid hormones or cytotoxic medications. In the second stage, staff risk assessed when caring for children and young people in isolation and not to automatically wear gloves, but only if there was potential exposure to bodily fluids.
Results In the previous year, 11.1 million gloves were ordered and cost £289,599.32. In the year post go-live, this reduced by 3.7 million gloves, to 7.4 million gloves with a cost saving of £90,000 and equated to 18 tonnes less plastic. To maintain staff engagement, these figures were converted to their equivalent weight in T-Rex. Thus, the first year saved 3 T-Rex worn of plastic.
Relevance to / impact on the triple bottom line The initial findings from this project are very promising and demonstrated that sustainability changes in clinical culture and practice are possible through the combined team work of education and infection control.

Towards plastic-free healthcare in Europe

Abstract author, designation, institution and contact email
Arianna Gamba Procurement Policy and Projects Officer, Health Care Without Harm (HCWH) Europe arianna.gamba@hcwh.org
Co-author name(s), designation and institution
Abstract
Aims/objectives To present the preliminary results of HCWH Europe's one-year pilot project 'Towards plastic-free healthcare in Europe'. The project aims to reduce damage to human and environmental health from plastics used in healthcare.
Methods Started in January 2020, HCWH will research the categories and quantities of plastics used and disposed at eight hospitals in five countries (Denmark, Iceland, Spain, Sweden, and the UK). Procurement and waste data will be analysed together with the results of on-site audits to map out key replace, reuse, recycling, and disposal options. In the second phase of the project, HCWH will educate its members and hospitals on the impact of their plastic use and suggested actions to reduce its harmful effects.
Results Healthcare market and practice transformation: the project stimulates innovative problem solving for single-use plastics and sustainable disposal methods, particularly through mobilising demand for sustainable plastic and packaging alternatives.
Discussion Share best practices and strategies for plastic reduction.
Relevance to / impact on the triple bottom line <ul style="list-style-type: none">• <i>Financial:</i> the UK's NHS pays to dispose of 133,000 tonnes of plastic each year, significantly contributing to its £700m annual waste disposal bill.• <i>Environmental:</i> the production and consumption of plastics contributes to global greenhouse gas emissions and climate change.• <i>Social:</i> the exposure to plastics and associated chemicals in healthcare poses distinct risks to human health.

Concurrent session 7

Intensive care and anaesthesia

14:15-15:15

Presenter	Title
Yoshimi Ito Eleanor Damm	One person's trash is another's treasure: our journey to reduce carbon waste and resource loss through appropriate waste disposal
Heather Baid	Environmental sustainability of intensive care service provision
Claire Swarbrick	The Royal Devon and Exeter's Green Team experience: reducing nitrous oxide use
Victoria van der Schyff Pei Jean Ong	Sustainability in anaesthesia

One person's trash is another's treasure: our journey to reduce carbon waste and resource loss through appropriate waste disposal

Abstract author, designation, institution and contact email
<p>Dr Yoshimi Ito ST6 Anaesthetics, University Hospital North Midlands yoshimi.ito@doctors.org.uk</p> <p>Dr Eleanor Damm ST5 Intensive Care Medicine and Anaesthetics, Royal Shrewsbury Hospital eleanor.damm@gmail.com</p>
Co-author name(s), designation and institution
<p>Dr Rachel Amor ST4 Emergency Medicine, Warwick Hospital</p>
Abstract
<p>Aims/objectives Are appropriate bins available in theatre and intensive care unit (ICU)? Are waste products disposed correctly?</p> <p>Methods Prospective data collection on availability of segregating bins and their contents in theatres and ICU pre-pandemic. A survey across the multidisciplinary team.</p> <p>Results Data from 40 theatres, 40 anaesthetic rooms and 224 ICU beds. 25 survey respondents.</p> <ul style="list-style-type: none">• Theatres: 40% domestic bins available with 77% appropriate contents. 31% had clinical waste bins; 40% appropriate contents. 94% medically contaminated infectious bins; 18% appropriate contents. Sharp disposal available 100%; 20% appropriate.• ICU: Clinical waste bins only available, with 81% of contents appropriate. Sharps disposal at all bed spaces, but all contained inappropriate waste.• Survey: 100% incorrect knowledge of waste management. <p>Discussion Poor waste segregation availability with majority of inappropriate disposal of contents. Financial and environmental implications, as resources lost and waste unnecessarily disposed of with high-energy incineration. Educational need identified.</p> <p>Relevance to / impact on the triple bottom line With increasing waste due to the pandemic, liaising with procurement, infection prevention, waste management and the wider multi-disciplinary team is vital to reduce</p>

use of single use items and to increase recycling facilities. Encourage local leadership through appointment of sustainability leads, raise awareness by education, formation of local and regional sustainability multi-disciplinary groups, and 'correct waste disposal' posters.

Environmental sustainability of intensive care service provision

Abstract author, designation, institution and contact email
<p>Dr Heather Baid Principal Lecturer, School of Health Sciences, University of Brighton H.Baid@brighton.ac.uk</p>
Co-author name(s), designation and institution
<p>Dr Tom Ainsworth, Principal Lecturer, School of Architecture and Design, University of Brighton</p> <p>Dr Chris Allen, Association of Anaesthetists and Centre for Sustainable Healthcare Fellow in Environmentally Sustainable Anaesthesia, Newcastle upon Tyne Hospitals</p> <p>Jason Beeching, former intensive care patient and service user representative.</p> <p>Dr Kubra Boza, Internal Medicine Trainee, Brighton and Sussex University Hospitals NHS Trust</p> <p>Dr Eleanor Damm, Specialist Trainee Intensive Care Medicine/Anaesthesia, Shrewsbury and Telford Hospital NHS Trust, Intensive Care Society Sustainability Workgroup</p> <p>Gabby Dempster, Subject Librarian, Information Services, University of Brighton</p> <p>Anna Fuhrmann, Climate Officer, Health Care Without Harm (HCWH) Europe</p> <p>Dr Åsa Israelsson-Skogsberg, Senior Lecturer, Faculty of Caring Science, University of Borås, Sweden</p> <p>Trish McCready, Critical Care Sister, Ward Manager and Infection Prevention and Control Lead Link Nurse, Guy's and St Thomas' NHS Foundation Trust</p> <p>Jessica Mills, Senior Practice Development Nurse, Western Sussex Hospitals NHS Foundation Trust</p> <p>Dr Ann Price, Principal Lecturer, School of Nursing Midwifery and Social Work, Canterbury Christ Church University</p> <p>Becky Ritchie, Acting Associate Directory Sustainability, Care Without Carbon, Sussex Community NHS Foundation Trust</p> <p>Dr Dipak Sarkar, Principal Lecturer, School of Pharmacy and Biomolecular Sciences, University of Brighton</p> <p>Oliver Slaughter, Sustainability and Environmental Manager, Care Without Carbon, Sussex Community NHS Foundation Trust</p>

Dr Fredrika Sundberg, Research Leader, Region Västra Götaland, Sweden

Dry Ryan Woodard, Senior Research Fellow, School of Environment and Technology, University of Brighton

Abstract

Aims/objectives

The GREEN-ICU (GREater ENvironmental sustainability in Intensive Care Units) research team includes intensive care nurses and doctors from University and clinical settings; sustainability experts with backgrounds in energy, procurement, materials science, design and waste management; and a former intensive care patient. This presentation will present findings from a systematic review addressing this question: what is the range of environmentally sustainable practices undertaken in intensive care settings?

Methods

The systematic review protocol is registered with PROSPERO ([CRD42020205717](#)) which details the full strategy for database searching and analysis of the final sample of publications selected for inclusion.

Results

A comprehensive search of the literature revealed a limited number of research-based articles to guide environmental sustainability in intensive care practice. Key themes will be summarised in the presentation highlighting priorities for where future research is needed.

Discussion

Large volumes of resources are needed to care for critically ill patients. This systematic review provides an initial foundation for exploring the environmental sustainability of resource-use within intensive care units.

Relevance to / impact on the triple bottom line

The GREEN-ICU team is using this review to plan a multi-phase, mixed-methods research project to develop evidence-based recommendations for how intensive care units can effectively reduce their carbon footprint, while maintaining financial and social co-benefits.

The Royal Devon and Exeter's Green Team experience: reducing nitrous oxide use

Abstract author, designation, institution and contact email
<p>Dr Claire Swarbrick ST5 Anaesthetics, Royal Devon and Exeter NHS Trust peter.valentine1@nhs.net</p>
Co-author name(s), designation and institution
<p>Dr Peter Valentine, Consultant Anaesthetist, Royal Devon and Exeter NHS Trust</p> <p>Dr Peter Ford, Consultant Anaesthetist, Royal Devon and Exeter NHS Trust</p> <p>Dr Fiona Martin, Consultant Anaesthetist, Royal Devon and Exeter NHS Trust</p>
Abstract
<p>Aims/objectives To reduce the use of N₂O in theatres.</p> <p>Methods As an Anaesthetic Department, our biggest carbon contribution was N₂O. We launched a campaign to reduce its use through education; departmental debate, motivational stickers and email discussions.</p> <p>Results We have reduced N₂O use by 22 500L (13.22t CO₂) from May-June 2019 compared to May-June 2018. Annually this is equivalent to 135 000L or 79.31t CO₂. We have produced a poster that summarises anaesthetists' power to make environmental change.</p> <p>Discussion Reducing N₂O use has environmental, financial and social benefits. We will save a projected £529 annually for its supply alone, plus manifold maintenance. There are clinical disadvantages to using N₂O; including nausea, hypoxia and increased miscarriages. There are concerns about N₂O abuse, by reducing our consumption we reduce availability on the streets.</p> <p>Our programme has sparked a departmental environmental interest that we are spreading across the Peninsula.</p> <p>Relevance/impact Removing N₂O from your anaesthetic practice is the single most effective environmental change you can make within your personal and work life. The carbon difference between 'green' and 'standard' anaesthetic practice is 335kg/day! Improving personal lifestyles to be more 'green' will only save 7.4kg/day of CO₂.</p>

Sustainability in anaesthesia

Abstract author, designation, institution and contact email
Dr. Victoria van der Schyff and Dr. Pei Jean Ong Junior Clinical Fellow Anaesthetics, Weston General Hospital v.vanderschyff@nhs.net
Co-author name(s), designation and institution
Abstract
Aims/objectives To reduce the environmental impact of anaesthesia in Weston General Hospital to align with the ideals of delivering more sustainable health care.
Methods Initial research into understanding the global warming potential and environmental impact of different aspects of anaesthesia which led us to the conclusion that one major contributor to our environmental impact was the use of volatile anaesthetic gases and most importantly Desflurane which has a much higher global warming potential than other commonly used anaesthetic gases. We contacted hospital pharmacy to establish the volume of each anaesthetic gas ordered per month over a 1-year period.
Results Although Sevoflurane was the most commonly used volatile aesthetic with 199 bottles ordered over a 1-year period; Desflurane was still responsible for 78% of our carbon dioxide equivalent emissions at only 66 bottles. This data will be presented to the anaesthetic department at Weston General hospital in January 2020 and an awareness campaign will be launched about the impact of volatile anaesthetic gases on the environment. A further audit will be done to assess the impact of this initiative.
Discussion Although there as scenarios where Desflurane is clinically indicated, we hope to reduce inappropriate use of Desflurane in Weston General Hospital by raising awareness of its environmental impact.
Relevance to / impact on the triple bottom line Sustainable health care is an important aspect of health in general. Anaesthetic gases have a huge global warming potential and reducing the use of volatile anaesthetics by encouraging low flow anaesthesia or total intravenous anaesthesia preferably can help reduce the environmental impact of providing anaesthesia for a patient.

Concurrent session 8

Social sustainability and sustainable development

14:15-15:15

Presenter	Title
Sarah Andersen	Singing for wellbeing: A qualitative study comparing how singing can affect women in choirs in the UK and Norway
Lauri Kuosmanen	Chatbot as a method for socially sustainable mental health care
Jasmin Abbott	Health for all? An assessment of transparency and labour rights risk in the supply chains of a UK Hospital
Graham Bickler	The triple bottom line: European states struggle to see the health benefits from sustainable development

Singing for wellbeing: A qualitative study comparing how singing can affect women in choirs in the UK and Norway

Abstract author, designation, institution and contact email
Dr Sarah Andersen GP, Herstmonceux Integrative Health Centre sarahandersen@doctors.org.uk
Co-author name(s), designation and institution
Dr Kari Bjerke Batt-Rawden , Associate Professor, Norwegian University of Science and Technology
Abstract
Aims/objectives A growing body of evidence links singing in community groups to improved health and wellbeing. The aim of this study was to explore how singing might influence health or wellbeing, and who might benefit from it, if it was 'socially prescribed'.
Methods This article compares our previously published findings, from nine choirs in two Norwegian towns, (n =19) with new data from semi-structured interviews and a focus group with women recruited from three choirs in Brighton in the UK (n =11), using a constructivist grounded theory approach.
Results In both the UK, and Norway, participants talked about singing in a choir being of fundamental importance to them, and some described it as necessary for their survival through depression, cancer or domestic violence. Recurring themes were; joyfulness, improved vitality, identity, confidence, and wellbeing.
Discussion This study provides a new hypothesis as to why and how singing can be so powerful for some women, and links this to Holt-Lunstad's data on complex social relationships affecting morbidity and mortality.
Relevance to / impact on the triple bottom line Social prescribing initiatives, such as singing for wellbeing, can potentially play a role in fostering social sustainability through health promotion.

Chatbot as a method for socially sustainable mental health care

Abstract author, designation, institution and contact email
Dr Lauri Kuosmanen Adjunct Professor, University of Eastern Finland, Finland lauri.kuosmanen@uef.fi
Co-author name(s), designation and institution
Heidi Nieminen , Research Assistant, University of Eastern Finland, Finland Anna-Kaisa Vartiainen , Project Coordinator, University of Eastern Finland, Finland Prof Catrine Kostenius , Professor of Health Science, Luleå University of Technology, Sweden Martin Malcolm , Head of Public Health Intelligence & Information Services, NHS Western Isles, Scotland Courtney Potts , Research Associate in Digital Health, Project Manager, Ulster University, Northern Ireland Dr Raymond Bond , Reader in Data Analytics, Ulster University, Northern Ireland Prof Maurice Mulvenna , Professor of Computer Science, Ulster University, Northern Ireland
Abstract
Aims / objectives To describe how ChatPal, a mental health chatbot, can contribute to the idea of sustainable health care and promote mental well-being of people living in rural areas in Finland, Sweden, Northern-Ireland, Ireland and Scotland. Methods We have designed the content of ChatPal in collaboration with mental health professionals, mental health service users and university students and staff. All development work is done in five different countries and with four different language versions. The chatbot is based partly on the needs analysis workshops carried out in the project and is based on the idea of positive psychology. Results ChatPal offer a tool to support and promote users mental wellbeing with exercises, health related information and simple mood tracking. ChatPal is freely available in application stores. Discussion We believe that ChatPal has potential to support citizens living in sparsely populated areas who face problems such as poor access to mental health services, lack of 24/7

support, barriers to engagement, lack of age appropriate support and reducing health budgets.

Relevance to / impact on the triple bottom line

ChatPal chatbot can contribute to sustainability by overcoming physical access barriers to social connections and thus promote socially sustainable healthcare

Health for all? An assessment of transparency and labour rights risk in the supply chains of a UK Hospital

Abstract author, designation, institution and contact email

Jasmin Abbott

Medical student, University of Cambridge Department of Public Health and Primary Care

jna30@cam.ac.uk

Co-author name(s), designation and institution

Miss Chantelle Rizan, Department of ENT, Royal Sussex County Hospital, Brighton

Mr Mahmood Bhutta, Department of ENT, Royal Sussex County Hospital, Brighton

Dr James Smith, University of Cambridge Department of Public Health and Primary Care

Abstract

Aims/objectives

1) Investigate transparency of supply chains of common healthcare products, by determining product country of origin (COI); 2) assess risk of labour rights abuses in manufacture.

Methods

In collaboration with Addenbrookes Hospital (CUH trust) procurement, the top 100 consumable goods by annual spend for 2018-2019 in Addenbrookes were systematically surveyed for COI on packaging and online sources. Known COIs were matched with the 2018 International Trade Union Confederation (ITUC) Global Rights Index. Analysis was weighted separately by spend and volume (units).

Results

Four capital goods were excluded. Eighty-three items' packaging was viewed. One manufacturer's website was unavailable. COI was disclosed on 82% of packaging and 20% of online sources. Twenty-eight percent of known products had COI rated 'no guarantee of labour rights' (ITUC 5) and 27% 'systemically violate rights' (ITUC 4).

Discussion

Our risk assessment suggests significant risk of labour rights abuse in the production of common healthcare equipment in high-value and/or high-volume items, with incomplete transparency of COI within packaging and online sources.

Relevance to / impact on the triple bottom line

The high risk presented here provides impetus to healthcare professionals, procurement agencies, UK government and other stakeholders to prioritise action. It is not known if these data are generalizable to other trusts, but this study could be repeated in other contexts.

The triple bottom line: European states struggle to see the health benefits from sustainable development

Abstract author, designation, institution and contact email
Dr Graham Bickler Honorary Clinical Senior Lecturer, Brighton and Sussex Medical School Gbickler@hotmail.com
Co-author name(s), designation and institution
Dr Stephen Morton Visiting Professor, Healthy and Sustainable Settings Unit, University of Central Lancashire
Abstract
Aims/objectives Countries report on SDG implementation through the UN Voluntary National Reviews (VNRs). We explored how the WHO Europe SDG Roadmap (the Roadmap) was reflected in the first 20 VNRs from WHO European states; specifically, integration of the three dimensions of sustainable development, health co-benefits and added value from the health sector.
Methods An assessment template with 41 criteria was developed drawing on proposed approaches and actions in the Roadmap. Each VNR was assessed and scored against these criteria to produce country-specific and average scores for the approaches and actions.
Results The VNRs had good evidence on governance, monitoring, leaving no-one behind and multi-partner cooperation, but less on health determinants, healthy settings, health literacy and investing for health. Many linked the economic and environmental dimensions of sustainable development but not with the social (health and well-being) dimension.
Discussion The health sector does not yet appear to have had a major influence on actions which influence wider determinants or health co-benefits. Any such benefits may not be captured in future cost benefit analyses.
Relevance/impact The Roadmap offers an opportunity for redressing this weakness, but health professionals need to engage with all three dimensions of sustainable development.

Concurrent session 9

Organisational and strategic approaches

14:15-15:15

Presenter	Title
Nikolaus C.S. Mezger Marlene Thöne	Climate protection in German ambulatory healthcare
Rosanna Spooner	Declaring a climate emergency: how a Trust can help incorporate sustainability into its core ethos
Nathaniel Duke	How to get an NHS Trust to Go Green
Fiona A. Miller	Sustainability Transition Experiments: The case of the health sector

Climate protection in German ambulatory healthcare

Abstract author, designation, institution and contact email
<p>Dr Nikolaus C.S. Mezger MD, Martin-Luther-University Halle-Wittenberg, Germany nikolaus.mezger@uk-halle.de</p> <p>Dr Marlene Thöne PhD Student, Universitätsklinik Tübingen, Germany marlene.thoene@gmx.de</p>
Co-author name(s), designation and institution
<p>Dr Eva J. Kantelhardt MD, Martin-Luther-University Halle-Wittenberg, Germany</p>
Abstract
<p>Objectives To evaluate the current status of climate protection measures in medical practices in Germany.</p> <p>Methods We conducted a nation-wide online survey among MDs on measures in place, preparedness for future activities, and obstacles concerning climate protection in private practices.</p> <p>Results Eight out of ten of 1683 participants regarded climate change as an urgent problem requiring immediate and extensive action. 1000 had already encountered climate change-related health issues in routine patient care. Overall, we saw a high degree of preparedness for sustainable transformation in use of energy, disposables and transport. Furthermore, we observed relatively high interest in sustainable financing and climate-friendly health counselling. Participants reported missing information, lacking institutional support and financial concerns as obstacles to the implementation of climate protection measures in private practices.</p> <p>Discussion Concern on climate change and motivation among MDs to act on climate protection might turn into comprehensive climate action if guidelines and policies promote sustainable management in the German ambulatory health sector.</p> <p>Relevance to / impact on the triple bottom line We present first data on status and attitude on climate protection in private practices in Germany. Our results may lead to further discussion on adaptation and mitigation, fostering evidence-based institutional and political decision-making on climate change.</p>

Declaring a climate emergency: how a Trust can help incorporate sustainability into its core ethos

Abstract author, designation, institution and contact email
Dr Rosanna Spooner Paediatric Registrar, Gloucestershire Hospitals NHS Foundation Trust rosiespooner@gmail.com
Co-author name(s), designation and institution
Prof Steve Hams , Director of Quality and Chief Nurse, Gloucestershire Hospitals NHS Foundation Trust Abigail Hopewell , Head of Leadership and OD, Gloucestershire Hospitals NHS Foundation Trust
Abstract
Aim To share the process by which Gloucestershire Hospital NHS Foundation Trust came to declare a “Climate Emergency” and subsequent experiences “post declaration”.
Methods Climate change is the biggest threat to health of the 21 st Century and rapid decarbonisation is required. A public ‘Climate Emergency’ declaration sends a message that we recognise the threat that climate breakdown poses to public health. In our Trust we held an open event known as #BigGreenConversation which brought together over 80 members of staff to focus on actions to reduce the environmental impact of our service delivery. Participants were grouped in tables of 6-8 people and challenged to give suggestions on how the trust could become more environmentally sustainable and to vote on whether to declare a climate emergency.
Results 98% of participants voted to declare a climate emergency and over 100 different ideas were generated, which were subsequently group into 6 themes.
Discussion and Relevance to / impact on the triple bottom line With strong staff support for a climate declaration a paper was submitted to the Trust board and public acknowledgement of a “Climate Emergency” was made 20 th Dec 2019. The board has also committed to including sustainability within its strategic objectives and aimed to deliver a stepped target of 80% carbon reduction by 2030. Details of how this will be achieved will be discussed in the presentation.

How to get an NHS Trust to Go Green

Abstract author, designation, institution and contact email
Dr Nathaniel Duke ST5 Anaesthetics, Western Sussex Hospitals NHS Foundation Trust dr.nathaniel.duke@gmail.com
Co-author name(s), designation and institution
Abstract
<p>Aims/objectives The NHS has the largest carbon footprint in the public sector, and needs to take urgent and radical action to achieve the Government's 2050 net-zero target. Trusts should have a Sustainable Development Management Plan (SDMP), and organisational structures in place to carry it out. At the beginning of 2019 neither BSUH nor WSHFT had either of these.</p> <p>Methods A convincing case for the need for action was written, including potential solutions, and was presented to departments across the hospitals (anaesthetics/surgery/medicine/pharmacy/O&G/theatres/ITU/comms) culminating in a meeting with the chief executive of both Trusts. A request was made for 1. Funding for a new SDMP. 2. Setting up an Environmental Sustainability Steering Group 3. A new sustainability manager role 4. A network of green champions 5. Board and clinical leads for sustainability.</p> <p>Results Agreement was given. Both trusts now have steering groups and are developing SDMPs. The new sustainability manager at WSHFT is setting up a network of Green Champions, and the same is being planned at BSUH.</p> <p>Discussion Change is possible, but you might have to ask for it!</p> <p>Relevance to / impact on the triple bottom line Impact remains to be seen, but the first steps of having a plan and the organisational structures in place to execute it, are well under way.</p>

Sustainability Transition Experiments: The case of the health sector

Abstract author, designation, institution and contact email
Prof Fiona A. Miller Professor, Institute of Health Policy, Management and Evaluation; Director, Centre for Sustainable Health Systems; University of Toronto Fiona.miller@utoronto.ca
Co-author name(s), designation and institution
Nicole Simms Managing Director, Centre for Sustainable Health Systems, Institute of Health Policy, Management and Evaluation; University of Toronto
Abstract
Aims / objectives The burning of fossil fuels is deeply entrenched in the operation of core social functions, including healthcare. Sustainability transition experiments (STE) are purposeful, challenge-led and practice-based initiatives to trial new socio-technical configurations and identify and alter the regime rules and behaviours that reinforce the status quo. We aim to understand how STE take shape within healthcare, to foster transformational change and progress towards sustainability.
Methods We will present early results from the evaluation of a recently-initiated STE – The “Sustainable Health System Community of Practice (CoP)” – using a multiple case study design and 3 data sources (documents, qualitative interviews, electronic medical records data). The CoP unites 12 academic hospitals and 7 health science faculties at the University of Toronto in a collaborative, practice-based and challenge-led effort to transition to low carbon care. The CoP has initiated 6 experimental projects that promote socio-technical change, while developing multi-scalar networks with broad potential impact.
Discussion and Relevance to / impact on the triple bottom line The work represents an innovative effort to leverage critical social science scholarship in the context of healthcare sustainability. Existing theories of sustainable change in healthcare are often tacit or undeveloped, relying on assumptions about individual attitudes and behaviours. More sophisticated theories of change are needed to guide change efforts.