



Sustainable Quality Improvement

Essential skills for healthcare professionals.

Summary

Despite growing awareness and concern about the climate and ecological emergency, as well as Government and NHS commitments on carbon reduction, there remains a gap in knowledge and skills for sustainable healthcare among health professionals. Integrating sustainability into quality improvement (QI) offers a practical way to fill this gap: addressing environmental challenges in healthcare as a core part of professional practice, and coupling it to a recognised method for change.

Need and opportunity for clinical innovation for sustainable healthcare

Ecological breakdown is the defining challenge of our time. Our health is fundamentally dependent on the health of the planet: we depend on functioning ecological systems for every single breath we take, every sip of water and mouthful of food, and yet many of these systems are now severely disrupted as a result of human activities – including healthcare. If the global health care sector were a country, it is estimated that it would be the fifth-largest greenhouse gas emitter on the planet¹.

Healthcare staff and students are increasingly voicing concerns about the ecological crisis and the need for the health sector to respond and lead by example. For example, in June 2019, in the same week that Channel 4 News featured Newcastle Hospitals declaring a climate emergency, the Guardian published a letter from >1000 doctors endorsing direct action on climate change. In September 2021, over 200 health journals published a joint editorial urging world leaders to take immediate emergency action to protect biodiversity and health²

In the Delivering a 'Net Zero' National Health Service report published in October 2020³, NHS England committed to reducing its carbon footprint to net zero by 2040, with an ambition for an 80% reduction (compared with a 1990 baseline) by 2028 to 2032. Furthermore, NHS Wales⁴ published ambitious plans in March 2021 to reach net zero by 2030. Many of the actions that have been identified as needed to achieve this will require changes to clinical practice (e.g. prescribing lower carbon inhalers) and the General Medical Council⁵ now requires medical schools to teach sustainable

¹REFERENCES

Health care's climate footprint: How the health sector contributes to the global climate crisis and opportunities for action. Health Care Without Harm (2019)

² Editorial: Call for emergency action to limit global temperature increases, restore biodiversity, and protect health <https://www.bmj.com/content/374/bmj.n1734>

³ Delivering a 'Net Zero' National Health Service. NHS England (2020). <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf>

⁴ Decarbonisation strategy delivery plan for NHS Wales (2021) <https://gov.wales/nhs-wales-ambitious-decarbonisation-plans-published>

⁵ GMC Outcomes for Graduates (2018) https://www.gmc-uk.org/-/media/documents/dc11326-outcomes-for-graduates-2018_pdf-75040796.pdf



healthcare to their students. Furthermore, the latest Nursing and Midwifery Council Standards of Proficiency for Midwives⁶ now include sustainable healthcare outcomes under Domain 5. However, these requirements have yet to be translated into widespread practice: NHS sustainability efforts continue to take place separately from clinical innovation, and there is a lack of knowledge and skills among clinical staff to be able to contribute.

What is a carbon footprint or net zero?

When thinking about the environmental impact of any healthcare intervention, there are several broad categories to consider.

The Carbon footprint: this refers to the amount of Greenhouse Gases (GHG) emitted directly or indirectly which are attributable to a process, product or organisation usually expressed in kg or tonnes of CO₂ equivalents.

Elements of healthcare activity with a measurable carbon footprint include:

- Energy use on site (burning fuel for heating, electricity use for lighting, cooking and cleaning etc)
- Release of anaesthetic gases / nitrous oxide (e.g. Entonox/Gas and air)
- Travel (staff, patients, carers)
- Medicines and medical equipment (supply chain emissions – from manufacture and distribution)
- Non-medical equipment and supplies (supply chain emissions for furniture, IT equipment, laundry, etc.)
- Food production
- Waste disposal

A carbon footprint is an important measure of environmental impact. It is quantifiable, enables progress to be tracked and aids comparison of different service models or products as every product, clinical pathway or healthcare organisation has a carbon footprint. However, it is not the only one. Other environmental impacts may also be involved.

Non-carbon impacts: Air pollution: non-carbon pollutants from fossil fuel use or waste incineration (e.g. nitrogen oxides (NOx), particulate matter)

- **Deforestation, landscape degradation, loss of biodiversity** (mining and plantations for supply chains e.g. latex gloves and medical instruments)
- **Depletion of scarce natural resources**, including fresh water
- **Bio-accumulation and toxicity** of chemicals entering the environment, often through water pollution (antibiotics, antidepressants, contraceptives, propofol)
- **Plastic pollution** from inadequate waste disposal systems / littering

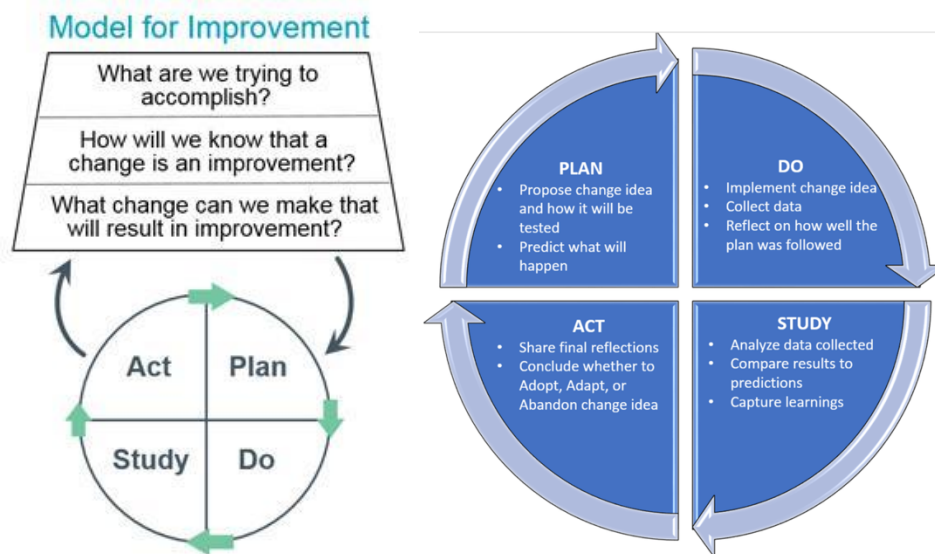
Net Zero: No doubt you've heard the term net zero but what does it actually mean? Net zero is a way to get a balance between the amount of GHG produced and the amount of GHG removed from the atmosphere. To reach net zero, the amount of GHG added to the atmosphere should be the same as the amount taken away. With good land stewardship, GHG can be removed from the atmosphere by natural processes such as forest growth and wetland restoration, as well as regenerative farming (which conserves the carbon content of the soil).

⁶ Nursing and Midwifery Council, *Standards of Proficiency for Midwives* 2019: NMC, 2019. Available at <https://www.nmc.org.uk/globalassets/sitedocuments/standards/standards-of-proficiency-for-midwives.pdf>

What is Quality Improvement?

There is no single definition of Quality Improvement (QI) but a number of definitions describe it as a systematic approach that uses specific techniques to improve quality. Put simply, QI is a way to improve services and to test out and try out new ideas. For QI to be effective, we need to know very clearly what we are planning to change and why. The QI process allows us to carefully make changes to a process by understanding the impact it may have upon our patients, populations and colleagues.

There are many different models used in QI, however, the most commonly used, due to its simplicity and power to accelerate improvement, is the 'Model for Improvement' designed by the Associates in Process Improvement (API). First, you answer three questions regarding the improvement idea/hunch before proceeding through the cycle of Plan, Do, Study, and Act (PDSA).



Why do we need to include sustainability in quality improvement?

The Royal College of Physicians has named sustainability a seventh domain of quality in healthcare, “which must run through and moderate other domains” (efficiency, timeliness, safety, patient experience, equity and effectiveness) ^{7,8}.

RCP seven domains of quality
(figure from Mortimer et al, 2018) ⁹



Making changes to the way that things are done in healthcare is not easy. It involves bringing colleagues on board, creating a common purpose, breaking problems down, trialling solutions, measuring impacts and learning from mistakes. These are the techniques and skills of quality improvement (QI) – which healthcare students are now also expected to learn.

By recognising sustainability as a domain of quality and linking sustainability improvement and QI together, staff and students can start to take action now on urgent environmental and ethical challenges, while developing the practical skills needed for effective change.

Sustainability in Quality Improvement – The SusQI framework

The Centre for Sustainable Healthcare has developed the “SusQI” framework for integrating sustainability into existing quality improvement (QI) models ^{iv}. Summarised in the table below, it recommends integrating into four elements of QI: setting goals, studying the system, designing the improvement effort and measuring impact.

⁷ A Strategy for quality: 2011 and beyond. Royal College of Physicians (2011)

⁸ Atkinson, S. et al. Defining Quality and Quality Improvement. *Clinical Medicine*, 2010 Vol.10(6):537-539

⁹ Mortimer, F. (2010)



Table summarising the SusQI framework (Mortimer et al. 2018):

Table 2. Building sustainability into quality improvement ('SusQI'): intended benefits		
QI element	Sustainability content	Intended benefits
1 Setting goals	Sustainability as a domain of quality; relationship to other domains	New motivation to contribute to QI, energy for change
2 Studying the system	Understanding environmental and social resource use / impacts; carbon hotspots in the NHS; 'seven capitals' matrix	Highlights wastes and opportunities which are often overlooked; stimulates radical thinking
3 Designing the improvement effort	The Centre for Sustainable Healthcare principles of sustainable clinical practice (prevention, patient empowerment and self-care, lean systems, low carbon alternatives) ^a – drivers and process changes	Directs towards highest value improvements, future proofing
4 Measuring impact / return on investment	Triple bottom line / sustainable value equation; measuring carbon	Drives sustainable change; allows benefits to be communicated to broader audience, not exclusively regarding financial cost-benefit

^aFrom Mortimer et al, 2010.¹² QI = quality improvement

1. Setting goals

With finite resources available to deliver a high standard of patient care, in SusQI the overall aim of quality improvement is to maximise sustainable value, i.e. to deliver the best possible health outcomes with minimum financial and environmental costs, while adding positive social value at every opportunity. (Within this, a narrower goal will be defined for a specific QI project.)

$$\text{Sustainable value} = \frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$$

2. Studying the system

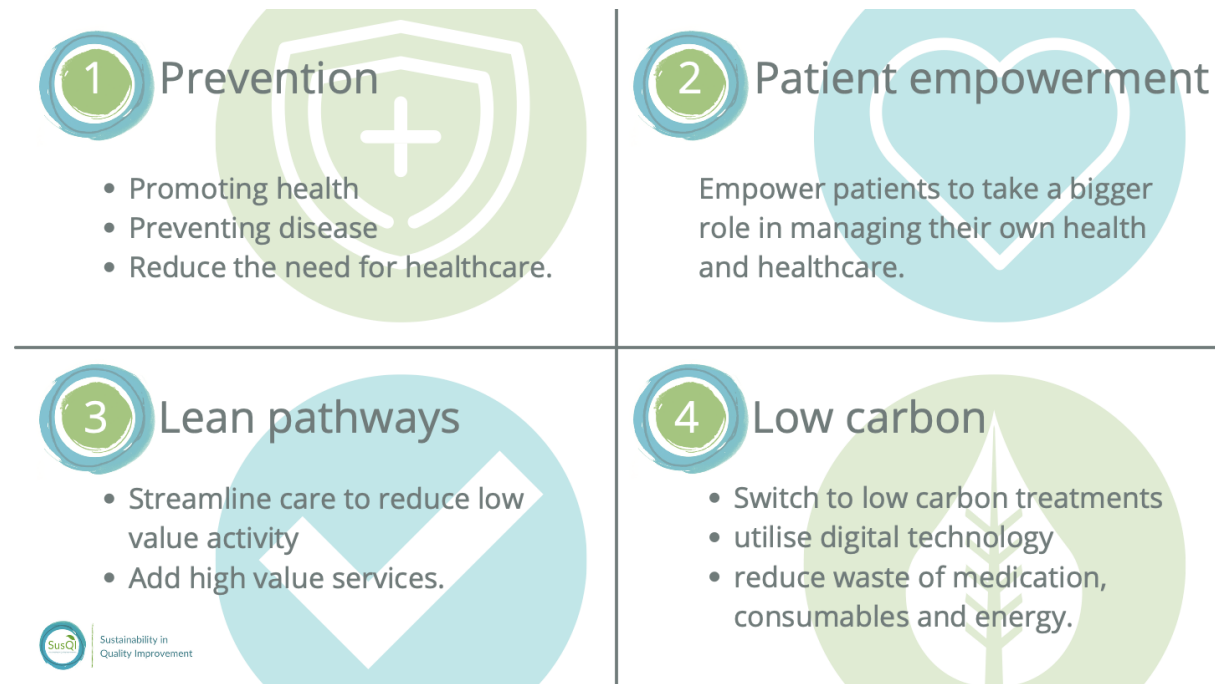
Before launching into trying to solve problems, the QI approach encourages us to really find out about how the system works currently, such as who is involved and what are all the steps in the process. In SusQI, this includes understanding how and where environmental, social and financial resources are being used, highlighting problems and opportunities for improvement.

3. Design of the improvement effort

The next step in QI is to come up with and test 'change ideas' (the combination of changes trialled is sometimes called the improvement effort). CSH has defined four principles of sustainable clinical practice, aiming to first minimise the need for healthcare activity and then reduce the environmental

impact of activity that is retained – while maintaining or improving health outcomes. The principles are numbered in descending order of importance: 1) prevention, 2) patient empowerment and self-care, 3) lean systems and pathways, and 4) preferential use of technologies and interventions with lower environmental impact. Applying these principles to the problem that you are tackling in your QI project can help to generate change ideas that improve sustainable value.

Principles of sustainable clinical practice, Mortimer (2010) ^{iv}



4. Measuring impact

Once change ideas have been tested and those that proved useful have been implemented, it is time to measure the overall impact of a QI project – to work out how well you have achieved your goal. SusQI requires that potential impacts (positive and negative) be considered for each of the five variables in the sustainable value equation:

- patient health outcomes
- population health outcomes
- environmental impacts
- social impacts
- financial impacts.

Measuring each of these can be easier said than done, but it is important to have a go – and at least discuss them. During the workshop we will practise applying these concepts of sustainable value to an example project.