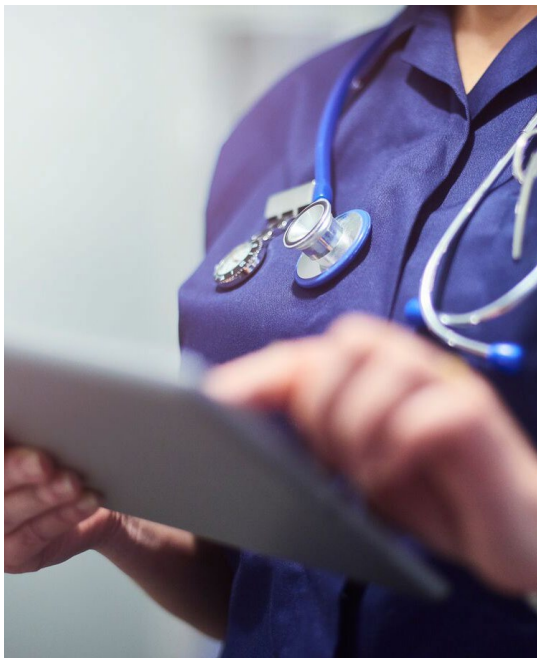
Sustainable Healthcare Toolkit

Reducing the environmental impact of medicines



Purpose

According to the UK Royal Pharmaceutical Society, the most environmentally friendly medicine is the one that is not required and not prescribed[i]. Every medication that is prescribed inappropriately, administered incorrectly, not taken by the patient, or not disposed of safely contributes unnecessarily to the environmental impact of the healthcare sector.

The purpose of this toolkit is to provide support and direction to healthcare colleagues who are seeking to reduce the environmental impact of healthcare associated with medicines in their organisation.

Background

Medicines play a central role in the delivery of healthcare with global prescription drug sales forecast to reach almost £1.4tn in 2026[ii]. Recent figures from the UK[iii], France[iv] and Australia[v] suggest that the contribution from medicines to greenhouse gas (GHG) emissions ranges from 19-33% of the total healthcare footprint, and therefore any actions taken to enhance prescribing, dispensing, patient compliance and waste management will have a significant contribution to minimising medicines' environmental footprint.

In addition to carrying a significant carbon footprint, pharmaceuticals also have wider-ranging environmental impacts. Around 600 different medicines have been detected in wastewater and effluent. While little is known about their long-term effects on the natural world[vi] - and ultimately on human health - there is evidence that effluents containing traces of medication can have a damaging effect on wildlife, aquatic environments[vii] and contribute to antimicrobial resistance[viii].

Research undertaken in Germany found that up to 16,000 tonnes of pharmaceuticals were disposed of annually from medical care, with 60-80% of these drugs flushed down the toilet or placed in normal household waste.[x]

Up to 90% of oral medications are excreted through faeces or urine into wastewater as active substances[x]

For many years pharmaceuticals have been the only class of compounds that are approved irrespective of environmental hazards, due largely to the assumption that societal benefit outweighs environmental impact[ii]. However, as our awareness of the link between people and planet increases, this assumption is being challenged.

Pharmaceutical Industry Attention

In recent years institutions including the UK Royal Pharmaceutical Society (RPS) and the Pharmaceutical Group of the EU (PGEU) have published a number of policies and best practice papers on sustainable pharmacy (which can be found in the 'Further Reading' section), and some pharmaceutical companies have joined initiatives such as the Sustainable Medicines Partnership (SMP) and the Sustainable Markets Initiative (SMI).

Pharmaceutical companies, governments and regulatory bodies are clearly best-placed to address the environmental impacts resulting from processes such as medicines manufacturing, packaging and logistics, to pharmacy infrastructure, commissioning and legislation around re-use of medicines. However, there is also a significant role for prescribers, healthcare professionals and patients to play when it comes to optimising prescribing, dispensing, compliance and waste management. This role is best summarised through the term **'low carbon prescribing'** which refers to;

- offering the right information to help patients to choose the most appropriate treatment,

- using the lowest effective dose for the shortest period of time,
- selecting drugs that have the smallest carbon and ecological footprint, and
- making the best use of non-pharmacological alternatives including psychotherapy, social prescribing[ix] or behaviour change.

Reducing the environmental impact of medicines

Areas of focus

Global estimates suggest that over half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take their medication as directed[x]. Recent reports in the UK alone estimated that at least 10% of prescriptions need not have been issued and that around 6.5% of hospital admissions in the UK were attributable to adverse effects of medicines.[xi,xii]

The majority of existing medicines management activities and quality/cost improvement programmes will be positively contributing to reductions in the environmental impact of medicine. The less waste and sub-optimal prescribing, the lower the environmental footprint of medicines.

Whilst many of the actions suggested in this toolkit apply predominantly to healthcare providers, healthcare funders can use these examples as a basis of engagement with third party providers around sustainable medicines, alongside broader commissioning strategies such as:

- inclusion of contract terms around best practice prescribing and dispensing that minimises waste
- clinical prior approval processes for out of licence drugs requests, and
- sector-wide collaboration around procurement and supply-chain efficiencies

The table below presents 5 areas of focus and tangible actions around medications management that will make a positive contribution to reducing medicines' environmental impact.

Focus Area	Rationale	Opportunities / Examples for Business Units
Improving patient compliance and participation	Implementing strategies that support patients in taking medications as directed will not only improve compliance and reduce waste-related impacts, but also deliver improvements in treatment efficacy[xvi].	1. Enhance patient literature, availability and accessibility of information, including; a. Method of administration b. Health and environmental impacts of poor compliance c. Safe disposal +/- return of unused medicines d. Recycling of cardboard packaging and paper leaflets 2. Implement behaviour change approaches and compliance strategies including shared decision-making to improve appropriate prescribing and enhance patient engagement[xvii] 3. Make use of local clinical decision support (CDS) tools that may help to identify patient-specific features which may improve compliance
Medicines optimisation and evidence-based prescribing	Prescribing in line with treatment guidelines and best practice could reduce the environmental impact associated with medications. In the UK, NICE has suggested that implementing the best practice outlined in its medicines optimisation guideline in England would save 202 tonnes of greenhouse emissions, 0.3 million m^3 of fresh water and 24 tonnes of waste[xviii].	1. Consider the use of CDS systems and tools. a. CDS is a potentially useful tool for ensuring the most evidence-based treatments are offered and hence for reducing ineffective and environmentally damaging prescribing[xix] 2. Target polypharmacy to reduce prescribing and improve health outcomes a. Targeting reductions in polypharmacy has been shown not to have inferior health outcomes in the management of hypertension in the elderly[xx] 3. Increase structure and/or frequency of medication reviews. a. Recent guidance has been published regarding Structured Medication Reviews[xxi], a clinical intervention designed to include a comprehensive review of a patient's medications. These reviews are conversations aimed at ensuring that a patient's medication is working well for them. This is underpinned by shared decision-making principles. The final decision to prescribe or discontinue medications should include consideration of the clinical evidence, the prescriber's experience and the patient's values, experience and wishes[xxii].

Minimising emissions from inhaled medication	Metered-dose inhalers (MDIs) contain propellants which are potent greenhouse gases. Switching to alternative, low global warming potential (GWP) inhalers, such as dry powder inhalers (DPIs) would result in large carbon savings. These savings can be achieved alongside reduced drug costs by using less expensive brands[xxiii]	1. Where appropriate promote non-pharmacological therapies such as smoking cessation, pulmonary rehabilitation and written management plans[xxiv]. 2. Conduct a detailed review of patients using inhalers to identify opportunities to optimise inhaler therapy[xxiv] including reviews of; a. patient's diagnosis b. inhaler technique[xxv], spacer use and patient-specific device matching c. frequency of inhaler use d. opportunities to switch to a lower carbon inhaler[xxvi] which could include DPI or smaller MDI e. opportunities to encourage preventer rather than reliever therapies or stop unnecessary inhaled steroids where clinically appropriate[xxvii] 3. Identify opportunities to recycle inhalers and encourage patients to keep track of doses to avoid disposal of half-used inhalers[xxviii]
Non-pharmacological interventions including social, green and blue prescribing	The recognition that people's health is affected by social, economic and environmental factors has led to greater focus on nonpharmacological interventions such as exercise prescription and social, green or blue prescribing There is evidence to suggest that alternative forms of prescribing can positively affect the physical and emotional wellbeing of people, improving their quality of life, levels of depression and anxiety and combatting loneliness. It may also reduce demand for healthcare services and medicines, resulting in an intervention with a lower environmental impact[xxix].	1. Engage with local or regional social, green or blue prescribing pathways, services, guidelines and research 2. Consider opportunities to reduce prescription rates in patients by identifying those individuals who may benefit from non-pharmacological interventions, e.g. pulmonary rehabilitation for COPD[xxx], structured exercise programs for osteoarthritis[xxxi], psychological support for mental health[xxxii]. 3. Explore social, green and blue prescribing through the sections in 'Further reading'.

More effective disposal and stock management	Existing guidance is that expired or unused pharmaceuticals should be returned to the supplier / manufacturer to aid safe disposal, but this is not always adhered to and there is evidence to suggest that many medications are disposed of in ways that risk environmental damage.	1. Strengthen information and patient awareness about returning unused, unopened and expired medications to the pharmacy instead of disposing of in household waste 2. Explore opportunities to make use of medications that are nearing expiry dates through local networks or initiatives such as Medicycle in the UK

Further Reading

The table above is not intended to be an exhaustive list. Other opportunities to reduce the environmental impact associated with medicines also exist, such as;

- reductions in paper use through digital prescriptions
- reductions in wasted journeys to pharmacies via digital patient notifications
- cycle courier delivery

This section contains a number of links to external sources where more information and initiatives can be found that may be relevant to your organisation.

1. The **Royal Pharmaceutical Society has published four policies** on sustainable pharmacy which provide excellent breadth of context, as follows:
    a. Improving prescribing and medicines use
    b. Tackling medicines waste
    c. Preventing ill health
    d. Improving infrastructure and ways of working

2. **Interventions to Reduce the Environmental Impact of Medicines** is a very thorough article which goes into detail on a number of interventions, some of which are referenced above in this toolkit.

3. For those interested to read more about social and green prescribing, the following webpages may be helpful
    a. **NHS England Green Prescribing**
    b. **Royal Colleges of Psychiatry / Occupational Therapy Position Statement**
    c. **The Australian Disease Management Association social prescribing initiatives**

4. The Pharmaceutical Group of the EU (PGEU) has published a **Best Practice Paper on Green and Sustainable Pharmacy in Europe** which spans a broad number of areas such as policy, infrastructure and clinical practice

5. The Centre for Sustainable Healthcare has a number of resources, including a **Sustainable Pharmacy Network.**

Glossary

Unwarranted Variation	Variation in healthcare delivery pointing to factors other than optimal patient care, and whereby differences cannot be explained by personal preference, illness, medical need or dictates of evidence-based medicine.
Shared Decision Making	Collaborative approach between healthcare professionals and patients where decisions about treatment options are informed by outcomes, benefits, risks and patient preference, including personal, social, cultural and environmental factors.
Social Prescribing	Healthcare professional (HCP) referral into non-clinical support services that support social cohesion and interaction
Green Prescribing	HCP referral into nature-based activities in green spaces
Blue Prescribing	HCP referral into nature-based activities near water (e.g. rivers, lakes)

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