Dispensing and Supply

October 2016

PSNC Briefing 054/16: Medicines Wastage and Prescription Duration

This PSNC Briefing updates PSNC Briefing 086/13: Medicines Wastage and Prescription Duration, which summarises information on prescription duration and medicines wastage. This Briefing also highlights literature on the environmental impacts of waste medicines which are not disposed of correctly.

Introduction

Pharmaceutical waste is a universally recognised problem within the NHS and whilst there are many local initiatives attempting to tackle the issue, there are no national programmes in existence.

The 2010 report Evaluation of the Scale, Causes and Costs of Waste Medicines written by York Health Economics Consortium and The School of Pharmacy, University of London estimated that pharmaceutical waste in England had a value of £300 million per year.[1]

This included an estimated £90 million worth of unused prescription medicines that are retained in individuals' homes at any one time, £110 million returned to community pharmacies over the course of a year, and £50 million worth of NHS supplied medicines that are disposed of unused by care homes.

What can cause medicines waste?

The NHS England commissioned report, *Pharmaceutical waste reduction in the NHS*[2] describes a number of causes of medicines waste, including patient non-adherence, repeat prescribing and over-ordering of medicines, changes in medication, patient death and prescription duration.

Not all unwanted medicines are returned to the pharmacy for proper disposal with many patients accumulating waste medicines in their homes and disposing of them by flushing them down the toilet or pouring them down the drain. A survey conducted in the USA showed that more than half of the patients surveyed reported storing unused and expired medicines in their homes, and more than half had flushed medicines down a toilet. Only 22.9% reported returning medicines to a pharmacy for disposal.[3]

Benefits of a shorter prescription duration

Many NHS commissioners advocate a 28 day repeat prescribing interval, recognising that this can make the best possible balance between patient convenience, good medical practice and minimal drug wastage.[4]

There have been several schemes which have shown drug cost savings when 28-day prescribing has been introduced

[1] York Health Economics Consortium and School of Pharmacy University of London, 2010, Executive Summary; Evaluation of the Scale, Causes and Costs of Waste Medicines
[2] NHS BSA, 2015, Pharmaceutical waste reduction in the NHS
[3] Seehusen & Edwards, 2006, Patient Practices and Beliefs Concerning Disposal of Medications
[4] NHS Ashford CCG, Guidance on Optimal Repeat Prescribing Duration

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– Grampian (16% cost savings), East Surrey (13% cost savings) and New Zealand which saved NZ$44m in 1995/96 based on 85% of prescriptions being dispensed monthly.

A 28-day prescribing policy coupled with the NHS electronic Repeat Dispensing Service (eRD) can save time and improve choice and convenience for patients and can help reduce the risk of medicines-related problems.[4]

Many areas of the country have utilised 28-day prescription durations as a means to reduce wastage and the following benefits are cited from 28 day prescribing as well as the reduction of wastage:[5]

- Many medicines are now packaged in 28-day packs and large quantities in multiple packs can lead to confusion, particularly in older people and result in duplicated doses.

- Coordination to allow all prescriptions to be requested and reviewed simultaneously avoids the need for multiple visits to the surgery and repeat requests. The end result can produce a more streamlined repeat prescribing system in the practice.

- Prescriptions issued on a 28-day basis do not always necessitate an appointment with a GP, but it does give the patient regular contact with a healthcare professional where they can raise any problems or concerns.

- Adherence/compliance issues are much easier to identify when prescription lengths are standardised to 28 days, as all regular items should be requested together.

- A 28-day supply of medicines produces a good balance between patient convenience and risk of wastage in unstable medical conditions, including hospital admissions.

A Clinical Commissioning Group (CGG) report[4] suggests a group of patients for whom 28 days or less prescribing may be more suitable:

- Patients in care homes (reduces waste and provides a safer process);
- Vulnerable patients on complex drug regimens;
- Vulnerable patients who are at increased risk of hospital admissions;
- Terminally ill patients receiving palliative care support;
- Drugs liable to abuse;
- All antidepressants;
- Patients requiring dressings;
- All Controlled Drugs;
- Sip feeds;
- Other 'hospital driven' high cost drugs, for example, antipsychotics and drugs for dementia;
- Patients who do not pay for their prescriptions; and
- Patients on monitored dosage systems (MDS).

A study conducted by Bradford University looked at waste medicines returned to 30 of the 76 community pharmacies in the Kirklees area over one month. It found that there was a linear correlation between mean values of returns and prescription length. It was estimated that there would be a reduction of 34% in the cost of waste medicines by changing the prescription duration to 28 days. On extrapolation of the total cost of returned waste medication, it

[5] NHS Nottinghamshire County, 28-Day Prescribing Policy

was concluded that the total waste per annum throughout Kirklees would be in the region of £80,000 and if extrapolated through the region would amount to in excess of £4.2million.[6]

Of the returns, 80% were prescription-only medicines (POMs) – cardiovascular and CNS were the two main BNF categories volume-wise, analgesics and non-steroidal were also high – and 90% of returns were from primary care sources. Cost of returns was shown to increase exponentially with age and duration of prescription.[6]

Prescription duration and environmental damage

When medicines are disposed of improperly, they can find their way into the environment. Many studies have assessed the fate of unused medicinal products to determine the share discarded down the drain or toilets, in domestic refuse or those that are appropriately collected. It has been estimated that on average in Europe 50% of the sold medicinal products are unused.[7]

If people dispose of medicines via sewage the medicines will end up in sewage treatment plants, which are generally not designed to filter and remove such material from wastewater. Human exposure to waste medicines can then be possible via tap water or from food chain contamination. Crops can take up some medicines from soil fertilised with manure or sewage sludge. Aquatic wildlife is exposed to low levels of many medicines, and as many rivers and ground water are also used as sources of drinking water for humans, or as irrigation water for food crops, measures which reduce wildlife exposure will also benefit people.[8]

When a substance is not detected in sewage systems, it does not necessarily mean it has actually been eliminated. Some substances may be degraded into transformation products that are not monitored. For instance, concentrations of guanyl-urea (the metabolite of Metformin) are often higher than concentrations of Metformin itself.[9]

Some studies suggest that longer prescription durations are a direct contributing factor to the accumulation of medicinal products in the environment. Entry into the environment by this route is dependent on the habits of the patient and the efficiency of prescribing practices leading to fewer unfinished prescriptions.[10]

One report suggests that the need for disposal of medicines is partly driven by imprudent, unnecessary, or excessive prescribing. The absence of a focus on pollution prevention drives continued prescribing for excessive durations. The prescribing modifications which could be implemented include reducing dispensed drug quantity.[11]

The report also notes that even though pharmaceutical agents are sometimes found at low levels in the environment, it does not mean they are harmless. Pharmaceuticals intended for pharmacotherapy are specifically designed to be potent agents and therefore concentrations detected do not give an indication of the associated risk.[9]

An American white paper report identified that over-prescription of pharmaceuticals in humans is a core contributor to the problem of pharmaceuticals in drinking water.[12] Failure to finish prescriptions is likely a common problem and contributor to pharmaceutical waste.

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[6] Hawksworth, Wright & Chrystyn; Journal of Social & Administrative Pharmacy: Vol 13, No. 4 1996
[7] European Environment Agency (2010), Pharmaceuticals in the environment. Technical report No 1/2010.
[8] ChemTrust, Pharmaceuticals in the Environment: A growing threat to our tap water and wildlife, 2014
[9] Executive Agency for Health and Consumers, 2013, Study on the environmental risks of medicinal products
[10] Bound & Voulvoulis, 2005, Household Disposal of Pharmaceuticals as a Pathway for Aquatic Contamination in the United Kingdom, Environ Health Perspect
[11] Daughton, Eco-directed sustainable prescribing: feasibility for reducing water contamination by drugs, Science of the Total Environment, 2014
[12] Wu et al. Dosed without prescription: preventing pharmaceutical contamination of our nation's drinking water, NRDC white paper, 2009

In California, data from an unused medication collection programme[13] showed that the vast majority of the medicines (72%) were returned because they were expired or outdated, suggesting that most doctors are either over-prescribing drugs or that patients are simply reluctant to finish their prescriptions. A collection program in Maine[14] attributed prescription changes or medicines that are no longer needed as the reasons more than half of the waste was generated.

The report, *Beyond the medicine cabinet: An analysis of where and why medications accumulate*[15], cites numerous reasons why medicines may accumulate and subsequently lead to waste by entering the environment from the disposal of unwanted medicines directly to sewers and trash.

Excessive prescribing has been listed as one of the main contributors to medicines waste. Patients may discontinue medicines for a wide variety of reasons, including adverse effects, feeling that the medicine is not effective, change in therapy as prescribed by their physician, or even a poor perception of the severity of their illness.

The report also states that low-quantity prescriptions in combination with more frequent repeats could be encouraged when the need for an ongoing course of treatment is not clear, especially when 90-day prescriptions are being considered.

A research paper, *Disposal practices for unused medications around the world*[16], attributes the stockpiling of unused and subsequently expired medicines to excessive prescribing by doctors. One of the solutions suggested was for doctors to minimise their prescribing of excessive medicines, as such practice is likely to drastically reduce the medicines needing to be disposed of in used or unused forms therefore reducing the potential of environmental impact.

A similar research paper, *Disposal practices for unused medications in New Zealand*[17], describes the change in the way medicines are dispensed in pharmacies in New Zealand. Doctors in New Zealand can issue prescriptions for a maximum of three months. Prior to October 2003, pharmacists used to issue a one-month supply at a time, and the patient had to return to the pharmacy monthly to collect the other two months. In October 2003, this changed, allowing 'stat' or 'all-at-once' dispensing to occur. As a result, 'stat' dispensing contributed to a growing proportion of unused medicines being disposed of or hoarded in households as a result of poor compliance to prescribed medicines by patients and excess supply of some medicines to patients. Unused pharmaceuticals that are not returned to the dispensing source are more likely to be disposed of as solid waste in a landfill or flushed down a toilet to become a component of liquid sewage. This study suggests that there is a significant proportion of unwanted prescribed pharmaceutical material flushed into sewage systems or disposed of in landfills in New Zealand.

If you have queries on this PSNC Briefing or you require more information please contact Zainab Al-Kharsan, Service Development Pharmacist.

[13] The Green Pharmacy Program with the Teleosis Institute
[14] Zimmer, C. "Reducing Pharmaceutical Waste." White Paper by the Minnesota Technical Assistance Program.August 2009
[15] Ruhoy et al, Beyond the medicine cabinet: An analysis of where and why medications accumulate, Environment International, 2008
[16] Tong et al, Disposal practices for unused medications around the world, Environmental International, 2010
[17] Braund et al. Disposal practices for unused medications in New Zealand, Environment International, 2009