MECHANISM TO PREVENT WASTAGE OF EXCESS MEDICINES

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Abstract--Every year millions of Rupees worth of unused medicines are being thrown away in India. A recent study reveals India is likely to generate an estimated 775.5 tonnes of medical waste per day by 2022 at an increasing rate of 7% per year. The cost of wasted medicine is not the only issue; their environmental impact also is a concern. A technology-driven comprehensive program to reuse unused prescription drugs could address the ill effects of the disposal of unused medicines. Institutions and individuals can donate unused medicines to this program. Certified pharmacists can then validate these medicines to ensure they meet specified criteria and is safe for reuse. A mobile app could enable users to register their excess medicines by scanning the barcode on the packaging. It could then connect them with institutions/pharmacies, that can distribute the medicines, to individuals in need, such as pharmacies, medical banks, and care homes. Individuals could be rewarded for their participation, in the program, with credits, and discount, on their prescription drugs. Such a program would not only help to reduce the health care cost but also facilitate safe disposal of unused medicines.

I. INTRODUCTION

The cost of medicines and appliances supplied by community pharmacists and dispensing doctors in India in the year ending March 2009 was in excess of Rs.7.5billion. The majority of the items dispensed by community practitioners are used by the patients for whom they were prescribed and – depending in part on how they are taken – confer positive benefits. However, it is inevitable that some degree of waste is associated with medicines supply (Jesson et al. 2005). Over and above problems such as inappropriate prescribing, not all drugs that are dispensed are taken by those for whom they were prescribed. Medicines waste as defined in this report refers to drugs that are dispensed but are ultimately physically discarded.

That is, they are put into domestic waste or the drains, or returned to pharmacists or dispensing doctors for incineration. In its publication Prescribing Costs in Primary Care (NAO 2007) the National Audit Office noted that the direct financial cost of medicines wastage as defined in this manner (calculated in list price terms, and including not only unused drugs but also items such as surplus dressings, appliances and prescribed nutritional supplements like 'sip feeds') has been estimated at 100 million annually.

But the NAO added that this figure is almost certainly a significant under-estimate and that the true value of NHS waste medicines (also sometimes referred to as residual medicines) may be as much as 10 per cent of the overall health service pharmaceutical and allied product 'bill' incurred in the community. That is, approaching 800 million in today's terms.

II. RELATED WORK

Other observers have stressed that not taking medicines as prescribed can, depending on the reasons underlying such behavior, result in avoidable illness. The value of the forgone therapeutic gains associated with medicines being taken sub-optimally (either because they are not consumed at all, or because they are taken incorrectly) may well be significantly in excess of the acquisition cost of all wasted medicines that have to be physically disposed off. This report is concerned with the current scale, causes and where possible prevention of NHS medicines wastage in primary care and community care settings such as care homes.

It summarizes the findings of qualitative and quantitative research on medicines wastage that was commissioned by the Department of Health. On the basis of the evidence gathered it offers recommendations as to how medicines waste might in future be further reduced. During the course of this research, attempts were made to identify the components of medicines wastage that are potentially avoidable, as opposed to wastage that should be regarded as an inevitable aspect of appropriate, high quality, pharmaceutical care.

An illustration of the latter would be a partly used medicine that is disposed of because the user's condition did not respond as the prescriber had anticipated. Within the potentially avoidable total, further attempts were made to distinguish between the volume and monetary value of waste that is cost effectively avoidable and that which
is not, albeit that there are considerable uncertainties involved in making such a differentiation.

III. PROPOSED SYSTEM

The solution for this program consists of three modules. **A user management module** with the self-registration capability to register and participate in the program. This application will be fronted with a mobile app with the ability to register for the program, scan the medicines through a QR code and to locate drop off locations or mobile units like pharmacies near the user. Participants will also be able to see their accrued credits or points only when the medicines are approved by the pharmacist based on the expired and unexpired medicines.

A web application module to create collection centers and pharmacies to receive and dispense unused medicines. Collection centers will be modeled as a physical or logical location with the ability to support mobile units. Medications with less shelf-life need to be suggested for the initial dispense by distributing it, and those medicines which are expired needs to be promptly removed from the inventory and should be recycled before disposal by removing the toxic substances.

An inventory management module to manage the stock of recycled medicines. The success of this program largely depends on how effectively the inventory is tracked and managed. The pharmacist should verify whether the unused medicines have further lifelines or not. In the next phase, this application can be enhanced to support various community outreach program to dispense medicines in the remote and disaster-affected area more safely and effectively.

IV. CONCLUSION

When considering implementing the 'best practice' described in this paper it is important to incorporate these themes to provide a framework that can be used support delivery of effective change at a local or national level. Of these themes the "Benefits" theme has often had the least focus and it is clear that it must be strengthening in any future initiatives. It has been shown that without robust understanding and tracking of the beneficial effect of an initiative (improved patient outcomes, financial savings etc.) it is hard to sell the success in a way that achieves longevity of the initiative.

It is only by being able to demonstrate these benefits that initiatives have been able to keep funding, sponsor buy in, and sustained momentum. Without installing longevity into such waste reduction projects it will not be possible to achieve any long term meaningful shift in patient, prescriber, and dispenser behavior that would result in an overall sustained reduction in pharmaceutical waste. Throughout all of the compiled case studies, success has been measured differently by the organisations which initiated them, however, it must be remembered that positive patient outcomes remain the ultimate aim.

V. REFERENCES

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