Medicines optimisation: Economic value of pharmacy-led medicines reconciliation at admission to hospital

An observational study undertaken in a large UK teaching hospital evaluated the cost–benefit of pharmacy-led medicines reconciliation. Out of a total of 864 medicines reconciliations, 13% of newly admitted patients had a preventable adverse drug event averted as a result of pharmacy intervention. The net benefit of 1 medicines reconciliation was between £34 and £80 (at 2012 value) with an approximate benefit cost ratio of between 5:1 and 11:1. Despite some limitations, this study provides real-life data that medicines reconciliation is a cost-effective intervention and is consistent with NICE guidance on medicines optimisation.

Overview and current advice

Medicines reconciliation, as defined by the Institute for Healthcare Improvement, is the process of identifying an accurate list of a person’s current medicines and comparing them with the current list in use, recognising any discrepancies, and documenting any changes, thereby resulting in a complete list of medicines, accurately communicated. It is well established that medicines reconciliation resulting in safer information transfer, reduces the risk of medicines related errors and adverse drug events. However the process of medicines reconciliation is not widely standardised and research focused on evaluating cost-effectiveness of pharmacy-led medicines reconciliation is lacking (Hammad et al 2017, Mekonnen et al 2016, Wang et al 2018).

Medicines reconciliation is recommended as a cost-effective intervention in the NICE guideline on medicines optimisation. Medicines optimisation is defined as ‘a person-centred approach to safe and effective medicines use, to ensure people obtain the best possible outcomes from their medicines. NICE recommendations support this approach by encouraging medicines reconciliation, medication review, and the use of patient decision aids.

The medicines reconciliation process will vary depending on the care setting that the person has just moved into – for example, from primary care into hospital, or from hospital to a care home. Good practice resources are available, supporting organisations to standardise and establish best practice for medicines reconciliation, such as the NHS Specialist Pharmacy Service Medicines reconciliation: best practice resource and toolkit and the All Wales Medicines Strategy Group medicines reconciliation policy. There are also several NICE shared learning examples relating to medicines reconciliation showing how NICE guidance and standards have been put into practice by different NHS organisations such as:

- Improving and maintaining medicines reconciliation on admission at North Bristol NHS Trust
- Neighbourhood Integrated Medicines Optimisation Team: Improving medicines use at home
- Developing and implementing a parent held medicines record for children with complex conditions
- Adopting a multi-disciplinary approach to improve medicines accuracy in a general surgical ward

The NICE Pathway: medicines optimisation brings together all related NICE guidance and associated products on this topic in a set of interactive flow charts. NICE has also produced a Key Therapeutic Topic on multimorbidity and polypharmacy.

New evidence

An observational, retrospective study by Onatade and Quaye undertaken in a large UK teaching hospital evaluated the cost–benefit of pharmacy-led medicines reconciliation for newly admitted patients over 6 reporting weekdays during 2012 (with an average of 144 medicines reconciliations conducted per weekday). Unintentional medicines discrepancies (referred to in the study as preventable adverse drug events) detected by pharmacy staff during the medicines reconciliation process were collated and retrospectively assessed by a panel of 5 senior practising pharmacists and rated for clinical significance. In addition, over a 2-week period, pharmacy staff conducting medicines reconciliations (6 pharmacists and 5 pharmacy technicians of varying grades) using a standardised 3-stage process were timed by 2 observers (n=48 patients). These data enabled the calculation of the estimated average cost of staff time required to carry out the medicines reconciliation. Staff costs were based on mid-point first level post-foundation clinical pharmacist salary range despite different grades carrying out the medicines reconciliations. The economic impact was calculated using the difference between the average cost of staff time to complete medicines reconciliation and costs avoided through preventable adverse drug events. Previous economic modelling work by Karnon et al. (2009) was used to estimate costs of preventable adverse drug events. Sensitivity analyses were conducted to test the limits of the economic impacts. The main study outcomes were preventable adverse drug events averted and associated potential cost impact.

The authors reported that out of a total of 864 medicines reconciliations conducted during the reporting weekdays, 13% (118/864) of newly admitted patients had a preventable adverse drug event averted as a result of pharmacy led medicines reconciliation. Most of the averted preventable adverse drug events (98% [116/118]) were rated for clinical significance. Seven of the events involved children, aged 16 years or less. Events were rated as either minor or causing no harm (31%), significant (38%) or serious (26%) and 5% were rated as potentially severe, life threatening or fatal. The cost avoidance of the averted preventable adverse drug events was calculated to have a minimum 2012 value of around £36,000 and a maximum value of around £75,000. The mean time to complete medicines reconciliation was 14 minutes (95% confidence interval 10.99 to 17.01; range 1–40 minutes) with a cost of £7.56. The net benefit of conducting 6 days’ worth of medicines reconciliations was calculated to be £29,604–£68,718 and the net benefit of 1 medicines reconciliation was between £34 and £80. The benefit cost ratio was calculated as 5.53:1–11.51:1.

The authors state that at the time of publication this study is the first to apply a NHS costing model to real-life data and the results suggest that medicines reconciliation is a cost-effective intervention. The study does have a number of limitations such as exclusive use of pharmacists to assess medicines reconciliation interventions for clinical significance. Other health professionals may have come to different conclusions regarding significance. The panel were asked to rate the clinical significance of potential, rather than actual, preventable adverse drug events. This approach likely overestimated the event rate as not all unintentional medicines discrepancies will lead to an actual adverse drug event. Only pharmacy staff salary costs were used to calculate costs incurred and the perspective was health system only (wider social, public health and personal costs were not considered). The authors also point out that the observational study would have had better internal validity if conducted as part of a clinical trial. Potential further confounding factors were identified as non-recording of patient level data
such as clinical characteristics, non-random selection of staff observed conducting reconciliations and electronic prescribing not being fully implemented across the hospital at the time of the study.

Commentary

Commentary provided by NICE
Despite the limitations identified by the authors, the findings in this real-world study are consistent with previous economic modelling suggesting that medicines reconciliation is a cost-effective intervention as recommended in the NICE guidance on medicines optimisation. Furthermore, the NICE shared learning database provides examples of good practice relating to medicines reconciliation. The Carter review (2016) on operational productivity and performance in English acute hospitals identified unwarranted variation in many areas, including medicines reconciliation. In particular, Carter recommended that pharmacists and pharmacy technicians should spend more time on front-line, patient-facing activities to improve medicines optimisation. The medicines optimisation dashboard highlights how NHS organisations compare with others across a range of medicines use and prescribing comparators. One of the patient safety comparators included is the percentage of adult inpatients receiving medicines reconciliation within 24 hours of admission with the aim of helping acute hospital Trusts improve their medication safety and to focus on the issue of medication error.

The World Health Organisation has launched a global initiative to reduce severe, avoidable medication-associated harm in all countries by 50% over the next 5 years. In the UK two-thirds of medicines-related hospital admissions are preventable (Howard et al. 2007) and addressing this problem is a national priority. Subsequently, NHS England is leading the medicines value programme which has been set up to improve health outcomes from medicines and ensure we are getting the best value from the NHS medicines bill. The programme includes funding for additional clinical pharmacists working in GP practices and care homes to deliver cost-effective interventions including medicines reconciliation, medication review and supporting an individualised approach as recommended in the NICE guidance on medicines optimisation.

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References

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