

# BMJ Open Quality Therapeutic duplication on the general surgical wards

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## ABSTRACT

Therapeutic duplication is the practice of prescribing multiple medications for the same indication or purpose without a clear distinction of when one agent should be administered over another. This is a problem that occurs frequently, especially on electronic prescribing records (EPR) as the medication chart is not always reviewed before prescribing. The aim of this Quality Improvement Project (QIP) was to reduce therapeutic duplication to 0% through educating the general surgical team. Prescriptions of all general surgical patients in the surgical wards were reviewed daily for a month. EPR was used to check if there were any duplications or identical class of drug prescribed. Patient documentation was thoroughly checked to rule out if the duplication was intentional. Following this, if duplication was still unclear, the relevant teams would be contacted for clarification. Any unintentional error was removed, and data was collected. The QIP results were presented to the local general surgical meeting and our fellow colleagues were educated on the importance of safe prescribing and on how to prevent prescribing errors. The baseline of therapeutic duplications on the general surgical wards was 9% prior to our first cycle. Following the presentation of data and educating the surgical team at the surgical meeting, the number of errors seemingly reduced, however, there was a jump to 22% of therapeutic duplication on a particular Friday which brought the average of therapeutic duplication to 8.77%. The team was reminded again about the importance of correct prescribing and after the second cycle, the number of errors reduced to 5.29%. For the third audit cycle, the team was presented with the reaudited data and following this, the number of errors dropped down to 3.12%. Therapeutic duplication should never occur as this could cause a risk to patient harm. Through educating the surgical team and reminding our team regularly, the average number of errors reduced by more than half of the original number. In our hospital, the main source of safety net is through pharmacists and nurses, however as shown, this is not enough to prevent all therapeutic errors. A more sustainable intervention such as an alert on EPR prior to prescribing may be required to maintain a low therapeutic duplication average and prevent patient harm.

## PROBLEM

Therapeutic duplication is a severe problem that needs to be fixed. It can cause patient harm and potentially death. It is the clinician's professional responsibility to check if a medication is already being taken by the patient prior to actively prescribing it. If it has already been prescribed, the medication

should not be represcribed. If the dosage or frequency needs to be changed then the current order needs to be deleted and then represcribed.

Despite there being a safety net in place with nurses and pharmacists actively checking the medications, this is not always guaranteed; especially on weekends, when there is only one on call pharmacist for the whole hospital and hence workload is increased.

To understand the severity of this problem in our department, general surgical patients on the surgical wards at the Princess Royal University Hospital (PRUH), King's College National Health Service (NHS) trust were included in this Quality Improvement Project (QIP) from October to November 2020. There are six surgical wards at the PRUH (surgical wards 3–8).

Prior to implementing the QIP, the baseline average of therapeutic duplications was identified to be 9% of general surgical patients. Our aim of this QIP was to reduce therapeutic duplication to 0% through educating the general surgical team. By the end of our QIP, we managed to reduce the number of therapeutic duplications to more than half of the original number (3.12%).

## BACKGROUND

Therapeutic duplication as a problem alone is currently not a largely discussed topic even though it can affect patient safety. This may be because it is often used interchangeably with the term 'polypharmacy'. There has not been a definite consensus on the meaning of polypharmacy, but it is thought to occur when a medical regimen includes at least one unnecessary medication or when a patient takes five or more medications.<sup>1</sup> Factors that contribute to this problem include: patient characteristics of increasing age, multiple medical problems, therapy expectations and decisions to self-treat; physician factors such as excessive prescribing and system problems of multiple providers and lack of a coordinating provider.<sup>2</sup>



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The main steps in improving therapeutic duplication that need to be addressed are:<sup>3</sup>

- ▶ Prescribers must write clear orders.
- ▶ Nurses must clarify unclear orders on receipt and before they administer medications.
- ▶ Pharmacists must clarify unclear orders before they dispense medications.

The onus on correct medication prescribing and correct distribution of medication lies with doctors, nurses and pharmacists. Any errors that are detected must be highlighted to the relevant team member in order for it to be rectified. Some possible reasons for unhighlighted errors may be due to implied clinician and allied health professional hierarchy. Empowering communication between all team members is important in reducing therapeutic duplications. In regard to patient safety, the research highlights that structured communication is effective in preventing medication errors. These errors can occur within the medication management cycle at any point of the drug distribution chain.<sup>4</sup>

Medication reconciliations completed by pharmacists minimises the risk for preventable adverse drug events. QIPs that were employed in the past focused on improving medication reconciliation documentation, improving accuracy of medication lists, reducing inappropriate medication use and minimising duplicate medication therapy.<sup>5</sup>

## MEASUREMENT

Initial data collections focused on general surgical prescriptions on all six surgical wards from mid-October to mid-November 2020 to assess the baseline number of errors. All current medications that patients were on were checked to see if there were any errors. This included checking for duplication of medications and same class of drug prescribed. We recorded the mistakes over a week and found an average of 9% of errors. We then educated the general surgical team in the local general surgical meeting and suggested ways in which this average could be reduced. The main suggestion was to check the electronic prescription section on electronic prescribing records (EPR) for the current medications already prescribed. Once it was evident that the drug/class was not prescribed then to go ahead and prescribe. Another suggestion was to review the British National Formulary (BNF) or local hospital protocols, to see if the medication was actually required.

We monitored the percentage of errors over the following week and found there to be a slight reduction in the average, but this was not substantial enough to make a difference to the baseline average. We presented our findings to the general surgical team again and explained the need to fix this problem due to the potential harm to patients. After this message was conveyed, the average went down to 5.29%. Finally, we re-audited using the same technique and represented our findings at the next local

general surgical meeting. Our final therapeutic duplication average was 3.12%.

## DESIGN

Our main intervention for this QIP was through educating members of the general surgical team at our local surgical meeting. We believed this would be effective as this meeting occurs weekly and is a protected time for all general surgical doctors. This was important as it gave us an opportunity to deliver our findings in a group environment and allowed for members to ask questions if anything was unclear. This intervention was expected to be effective because we were able to reach most of the team to inform them of the problem. On feedback, many clinicians were unaware that this was a significant problem. Once team members were aware of the problem, they understood the severity of this and were willing to put more emphasis on prescribing correctly.

For this QIP we had two foundation year 1 doctors who collected data and presented the findings. The foundation doctors collected data every day for 4 weeks and regularly debriefed on findings. A general surgical consultant and a radiology consultant, who also carries the role of quality improvement lead for the PRUH, were also involved. These senior colleagues supported our QIP through probing questions that were important for patient safety and whether or not there are safety net pathways which are already in place at the PRUH.

This team structure worked well as there were different levels of seniority and experience. We were able to look at the bigger picture and map out processes already in place in order to see the flaws in the system.

## PATIENT AND PUBLIC INVOLVEMENT

This was a QIP that observed clinician prescribing habits and communication between allied health professionals. Patient and public involvement did not occur during the design, implementation and analysis of information.

## STRATEGY

Our smart aim was to reduce the number of therapeutic duplications by clinicians on the general surgical wards to 0%. The Plan-Do-Study-Act (PDSA) model was used to carry out our QIP.

### PDSA cycle 1

Our initial intervention was to present our findings to the general surgical team at the local surgical meeting. Leading up to the meeting, we collected data over a week without revealing that the audit was to take place. We started the presentation with the importance of correct prescribing and the reason for undertaking this audit. We then provided the evidence that we are currently not prescribing at the standard that should be achieved. Following this, we allowed for group discussion to brainstorm reasons for under achieving the prescribing goals.

## Box 1 Therapeutic duplication error types

### Error types

- ▶ Duplicate oxycodone (tablets and solution).
- ▶ Regular medications prescribed twice.
- ▶ Same antibiotics prescribed twice.
- ▶ Ondansetron prescribed twice sometimes thrice.
- ▶ Naloxone prescribed twice.
- ▶ Lansoprazole oral and pantoprazole IV.
- ▶ Laxatives/antidiarrhoeal medication prescribed twice.
- ▶ Sando K tablets and K+IV fluids prescribed.
- ▶ Clexane prescribed twice at different times.

### PDSA cycle 2

We continued to collect data daily and for our second cycle we did a group wide reminder to our general surgical WhatsApp communication group. This provided a wider communication to all team members, especially to those who did not attend the initial local surgical meeting presentation. This brought the number of therapeutic duplications down to nearly half (5.29%) of the initial numbers and was sustained till the third cycle.

### PDSA cycle 3

We repeated our intervention of educating the general surgical doctors group at the local general surgical meeting. This occurred two weeks after our initial presentation. We chose to re-educate the team as we found that this had an impact on reducing therapeutic duplication. During this teaching session, we went deeper into our findings and listed the main error types (box 1) that were found during data collection. We also presented a process map (figure 1) to illustrate the main points of error during the prescribing process. This allowed doctors to reflect on their practice and be aware of key error points. Following this third cycle, the therapeutic duplication on general surgical wards was brought down to 3.12%, compared with the initial 9%.

The methods we undertook to educate our colleagues were through presenting staggered statistics on the number of therapeutic duplications on our surgical wards. We explained in the meetings that through using our electronic prescribing system, we were able to review prescriptions and collect data for analysis. The statistics showed the areas of improvement and areas that were lacking in reducing therapeutic duplication. We designed a prescribing flow sheet and advised on processes that could be implemented to prevent this error. Areas where mistakes were likely to occur were highlighted to the team. As we were the leads for the QIP, the presentations were done by ourselves. Unfortunately, at times there were some team members who were not present at our regular teachings. To ensure these colleagues were given all the relevant information, we shared the data and presentation on the team WhatsApp group.

During the QIP period, the teaching sessions were delivered frequently to our team, but in a short time frame. Due to this, the percentage of therapeutic

duplications may have slowly increased to the original number of errors, as the team reminders had stopped. In our hospital, new team members are frequently added to the surgical team and it would be beneficial to have a 'therapeutic prescribing champion' who could deliver the presentation every few months. Data could be collected to review if the number of teaching sessions needed to be increased. Another method to help to sustain the number of therapeutic duplications is to set up reminders on the electronic prescribing system. This method was not trialled by our team but could be a potential solution for preventing duplications, which as mentioned, can be an extremely dangerous error.

## RESULTS

Our main outcome measure was the reduction in therapeutic duplication on the general surgical wards. As shown by the results, there was a significant difference in therapeutic duplication following each PDSA cycle implemented.

After each new intervention, the number of therapeutic duplications continued to decline in a step like manner (figure 2). The percentage of therapeutic duplications reduced from 9% to 3.12% by the end of our third audit cycle. This shows that frequent reminders and education of the team can contribute greatly towards improving the number of therapeutic duplications, in addition to the safety net pathways already in place.

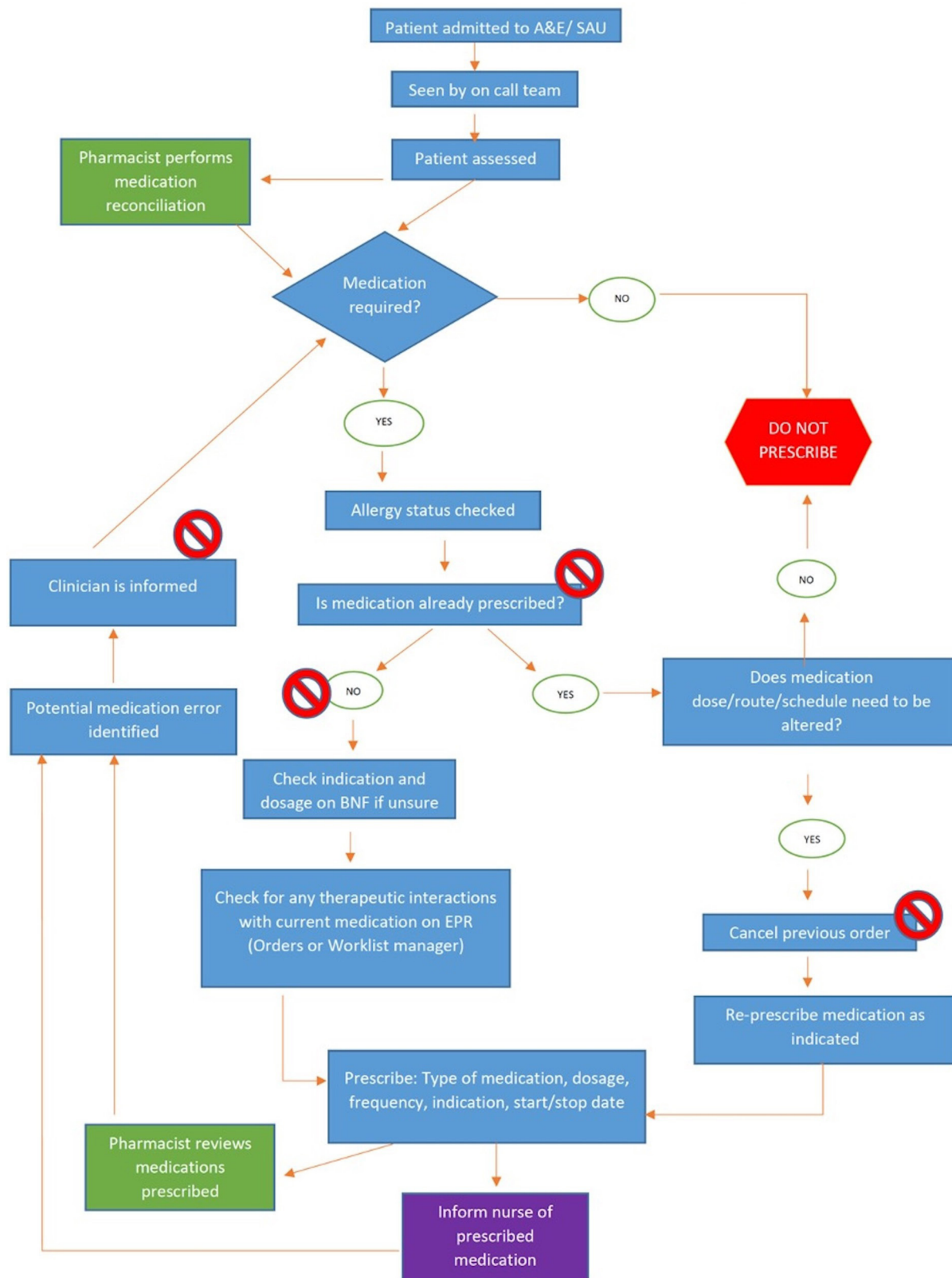
Despite there being an improvement in reduction of therapeutic duplications, there were particular days that had more errors compared with the rest of the week. This may have been related to clinician fatigue as the particular days were generally towards the end of the week.

Our prescribing process map (figure 1) highlighted the main points of errors in the prescribing process. We identified that clinicians did not frequently review whether a medication was already prescribed. We also identified that when a clinician did realise that a medication was already prescribed, they did not remove the previous prescription before prescribing a new medication. And finally, when an error was identified, often the safety net of communicating this error was not performed.

## LESSONS AND LIMITATIONS

There were some limitations to our QIP. One of them being the medications were not reviewed at the same time every day. This could have caused a skew in results as usually the unintentional errors occurred in the morning just after ward round as this is usually the time when doctors are the busiest. Therefore, if the medications were checked in the morning there was usually a higher percentage of errors compared with that in the afternoon.

Another limitation was that not everyone was present when we had the teaching and presentation of our data, due to annual leave, zero days and being busy on the wards. Not only this but some members, especially SAAU (surgery and ambulatory unit) staff are not in our general surgery group.

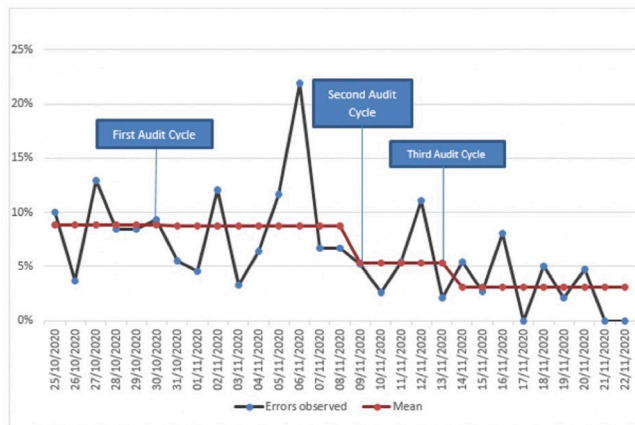


**Figure 1** Prescribing process map.

This means that some staff members did not even realise that therapeutic duplication is a current issue that needs to be fixed. The relevance of this is that the SAAU staff are the first point of contact for surgical patients therefore errors could potentially occur at this step. To help to bridge this gap, we

also presented our findings to the general surgical WhatsApp group. All junior members on the surgical team are part of this group and would have access to the presentation and data.





**Figure 2** Therapeutic duplication on surgical wards graph.

If we were to do the QIP again, we would ensure that we increase the sample size to widen the scope beyond only general surgical patients and surgical wards. We would implement it so that every patient's prescriptions are reviewed, and that teaching is throughout the whole hospital as this problem is not only confined to surgical patients but to all.

## CONCLUSION

This QIP was effective in highlighting the problem of therapeutic duplication when prescribing. It allowed us to visit the common error types and distribute this information to our team. We were able to educate the team and reflect on the importance of correct prescribing.

We were able to demonstrate that a simple and effective way to prevent therapeutic duplication is to be aware of the problem and to check prescriptions prior to prescribing a new medication. These are all steps that should be taken but has been neglected due to clinician workload.

Despite this improvement through educating the team, we believe there needs to be a more sustainable intervention to maintain a low therapeutic duplication average. This is because it only takes one mistake for a fatal error to occur.

Further approaches to prevention could include appointing a therapeutic duplication lead in each

department to frequently remind and educate their team members. Another approach could be to implement alerts on EPR to reduce potential harmful or fatal prescribing mistakes.

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