

# Saving the NHS one blood test at a time

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## Abstract

As a team of junior doctors our aim has been to save costs in day to day work so that money can be reallocated to improving nursing staff levels on our wards. Stem cell units have regular blood collection schedules in order to monitor organ response to chemotherapy and to look for complications in immunocompromised patients. We set out to reduce the number of biochemical investigations to a minimum that would be clinically indicated. We designed a new blood collection proforma for nursing staff to follow and audited all blood tests taken during a 2 week period before and after its introduction. The number of inappropriate blood tests were recorded as those that were not clinically indicated or not present on the collection schedule. After the introduction of the change the number of inappropriate tests were reduced by 937 over the 2 week period, with a cost saving of £1,478.42. Similar strategies for reducing unnecessary investigations and focusing on tests that will change management could help the NHS cope with a difficult financial future and provide continued safe staffing levels and quality care.

## Problem

Many trusts throughout the UK have faced cuts to funding. As a team of junior doctors we set out to save costs in day to day work so that the money could be reallocated to improving nursing levels. As a consequence we hope to improve the quality of patient care that can only be provided by a good nurse to patient ratio.

The stem cell unit has had a daily blood haematological and biochemical measurement schedule carried out by the nursing staff. This has changed little in the previous few years and involves daily full blood count (FBC), urea and electrolytes (U&E), liver function tests (LFTs), bone profile, lactate dehydrogenase (LDH), magnesium, clotting, and C-reactive protein (CRP). Over time it became apparent that the number of tests were excessive and expensive, leading to minimal difference in clinical decision making.

## Background

The haematology oncology unit carries out a significant number of stem cell transplants. There is a need to monitor organ response to chemotherapy in order to adjust medication dosage and to look for complications in immunocompromised patients. However, excessive blood tests can be uncomfortable for patients and expensive for the NHS, while providing little clinical benefit.

## Baseline Measurement

Over a 2 week period we documented all the blood tests taken for every inpatient on the stem cell unit undergoing a stem cell transplant. This was according to the established blood collection schedule used over the past several years.

## Design

A multidisciplinary team meeting with several consultants

determined an optimal blood collection timetable. We used a related blood schedule guideline from the European School of Haematology for stem cell transplants receiving parenteral nutrition (1). This consisted of FBC and U&E daily, and twice weekly LFTs, bone profile, magnesium, and clotting. There was no need for CRP or LDH. This was only altered if there was a clinical indication.

Subsequent to this meeting we designed a new collection proforma for the nursing staff to follow involving an Excel table showing which bloods to be taken on which days.

Blood tests were categorised to inappropriate and appropriate blood tests depending on two clauses: (1) whether it followed the new proforma (appropriate) or not (inappropriate); and (2) whether the blood test was clinically indicated (appropriate) or not (inappropriate). For example, some patients would need daily clotting for clinical reasons, in which case these blood tests would be considered appropriate.

## Strategy

The new proforma was designed and refined after discussion with several consultants and multidisciplinary team members. The schedule was placed on the IT system and printed out weekly by the ward clerk as the previous timetable had been. In addition we held several meetings to discuss this new proforma with as many members of the nursing team as possible.

A few weeks after the introduction of this new proforma we re-audited a 2 week period covering all inpatient stem cell transplant patients and the blood tests they underwent.

## Results

We documented all blood tests taken over a 2 week period before and after the introduction of the new pro forma. They were categorised into appropriate and inappropriate blood tests as

outlined in the design section.

The number of inappropriate blood tests before the proforma over a 2 week period was 1184 out of a total 2526 tests (47%). The total number of inappropriate blood tests after the proforma over a 2 week period was 247 out of a total 1367 tests (18%). This amounts to a total reduction of 937 blood tests over a 2 week period. Of these, the greatest reduction came from CRP (253), followed by LFTs (217), magnesium (160), bone profile (129), LDH (116), and clotting (62) (Figure 1).

The laboratory provided us with the costing for each blood test: FBC £2.65, U&E £2.12, LFTs £2.78, bone profile £0.79, CRP £1.03, magnesium £0.57, and clotting £3.43. When the cost of each blood test was applied the total savings came to £1,478.42 over a 2 week period.

Importantly there were no complications in patient care from the reduction in blood tests. This was assessed by the consultants reviewing all blood tests twice weekly and daily senior ward round documentation.

See supplementary file: ds2756.docx - "Figure 1 "

## Lessons and Limitations

Introducing the new proforma provided some challenges. Due to the high number of nursing staff, including agency staff unfamiliar with the ward, it was difficult to introduce and implement change. As such, inappropriate tests were still being done after the introduction of the proforma. To overcome this, several discussions were carried out with the nursing staff and ward clerks to implement the use of the new schedule. To ease this transition, the new proforma could have been advertised through the Trust email to the different staff and displayed on the wards.

This project was performed over a relatively short time period including only two to three groups of nursing shift rotations. A longer period would be needed to ensure the new standard was maintained by all staff. As this was a significant change in a long established routine there will need to be more reinforcement to maintain the sustainability of the change. This would need to be reassessed in several months time with a repeat audit. A long term strategy would be to assign responsibility to a senior nurse who could ensure continued engagement with the programme rather than rotating junior doctors.

This project also led to a need for closer communication between staff so clinically important blood tests would not be missed through adherence to the proforma.

## Conclusion

Through a relatively simple change in practice on the ward level we reduced unnecessary blood tests for patients and achieved a cost saving £1,478.42 over a 2 week period. This is projected to an annual saving of £38,438 which we have presented to management

as a potential source of revenue for improving nursing staff levels. Similar strategies for reducing unnecessary investigations and focusing on tests that will change management could help the NHS cope with a difficult financial future and provide continued safe staffing levels and quality care.

## References

1. Apperley J, Carreras E, Gluckman E, Masszi T, eds. ESH-EBMT Handbook on Haematopoietic Stem Cell Transplantation, 2012. European School of Haematology-European Society for Blood and Marrow Transplantation.

## Declaration of interests

Nothing to declare

## Acknowledgements