

## Guidelines for Checking Blood Results on the Acute Surgical Wards

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Received date: October 27, 2016; Accepted date: January 19, 2017; Published date: January 30, 2017

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Citation: Humphrey J, Antonios T, Wiik A, Blake L, Billington J, et al. (2017) Guidelines for Checking Blood Results on the Acute Surgical Wards. Trauma Acute Care 2: 31.

### Abstract

**Introduction:** Hospital blood tests are performed in high volume to facilitate clinical diagnosis and to monitor patients' response to therapeutic intervention. There is currently no academic literature or formal guidelines advising on optimum time frames when blood results should be checked. Our study aims to assess the time taken for junior doctors on acute surgical wards in a District General Hospital to review available blood results and implement guidelines if required, to maintain consistent clinical care and patient safety.

**Methods:** Data was collected retrospectively during a month from three acute surgical wards (two general surgery wards and one orthopaedic trauma ward). All blood samples taken in this period were assessed to see the time frame that results were being reviewed.

**Results:** 1,325 blood samples were received and analysed by the hospital laboratory. The time frames that these blood results were first accessed are <6 h 1,020 (77.0%), <12 h 1,111 (83.9%), <24 h 1,203 (90.8%), 24-48 h 1,247 (94.1%), 48-72 h (96.1%) and >72 h 1,325 (100%). Of the 122 blood results not reviewed within 24 hours all had at least one component of a test outside the normal reference range.

**Conclusion:** Our results show time to checking blood results can be significantly improved. To ensure all patients are cared for as advocated by the Royal College Surgeons 'Good Surgical Practice', we propose all blood results should be checked and acted upon within 12 hours of the results being available or expeditiously if the clinical situation requires.

**Keywords:** Blood tests; Guidelines; Acute surgical wards; Patient safety

### Introduction

Hospital blood tests are performed to facilitate clinical diagnosis and to monitor patients' response to therapeutic intervention. Junior ward doctors order and/or perform blood tests for patients as a part of their daily working duties. It is the responsibility of the doctor ordering the test to check the results

once available and act accordingly. There is no academic literature, which dictates the optimum time frame in which blood results should be reviewed. The urgency arguably will vary depending on the indication, type of blood test and the patient's clinical condition. However, implementing standardised time frames to check blood results would ensure consistent patient safety, as advocated by the Royal College Surgeons Good Surgical Practice [1].

The objective of this work was to assess the time taken for junior doctors on acute surgical wards to review available blood results. This will provide an opportunity to standardise our clinical practice and improve quality of care, by initiating guidelines for checking blood results.

### Patients and Methods

Data was collected retrospectively during a month from three acute surgical wards (two general surgery wards and an orthopaedic trauma ward) at a London district general hospital. All blood samples taken in this period were assessed to see the time frame that results were being reviewed. WinPath is the Laboratory Information Management System (LIMS) used in our hospital to access patients' pathology results. The in-built 'audit view' tool allocates each sample ordered a serial number. Each sample ordered in the same window can request a single test or multiple tests (e.g. full blood count and C-reactive protein). It subsequently records the time when the first results become available to be viewed and the time when a doctor first accesses the result. The system is protected under the Data Protection Act and all patient information was confidential.

The time taken to first access each blood result once available was allocated into one of six time-frame categories: <6 h, <12 h, <24 h, >24 h but <48 h, >48 h but <72 h, and >72 h. All blood results not accessed within 24 h were analysed, by identifying any abnormal results that were outside the reference ranges on the WinPath LIMS.

### Results

During the targeted week 1,361 blood samples were ordered from the three acute surgical wards. The hospital laboratory received and processed 1,325 (97.4%) of them. Each of the 3

wards has a capacity of 24 patients. The time frames that blood results were first accessed are <6 h 1,020 (77.0%), <12 h 1,111 (83.9%), <24 h 1,203 (90.8%), 24-48 h 1,247 (94.1%), 48-72 h (96.1%) and after 72 h 1,325 (100%) (Table 1). Of the 122 blood samples not reviewed within 24 hours all had at least one component of a test outside the normal reference range quoted on WinPath LIMS.

**Table 1:** Displaying the time frames blood test results was first accessed.

	Acute Surgical Ward (SW1)	Acute Surgical Ward (SW2)	Orthopaedic Ward (OW)	Total (Cumulative %)
Blood specimens received by the lab	497	433	395	1325
First review <6 hours	381 (76.5%)	327 (75.5%)	312 (78.9%)	1020 (77.0%)
First review <12 hours	409 (82.1%)	355 (82.0%)	347 (87.6%)	1111 (83.9%)
First review <24 hours	451 (90.6%)	391 (90.3%)	361 (91.1%)	1203 (90.8%)
First review >24 hours and <48 hours	463 (93.0%)	411 (94.9%)	373 (94.1%)	1247 (94.1%)
First review >48 hours and <72 hours	476 (95.6%)	419 (96.7%)	379 (95.6%)	1274 (96.1%)
First review >72 hours	497 (100%)	433 (100%)	395 (100%)	1325 (100.0%)

## Discussion

The main aim of our study, to retrospectively assess the time taken for junior doctors on acute surgical wards to review available blood results was met, as out of 1,325 samples analysed 83.9% were checked within 12 h and 90.8% checked within 24 h. Out of the blood results not checked after 24 h, 100% of those had at least one component, which was outside the normal reference range.

There are no specific time frame guidelines when blood results need to be checked, because of significant variation on indication, availability, test ordered, patient's condition and the clinical setting. Acute surgical patients on the General Surgery and Trauma Orthopaedic wards though can be categorised as a priority group. To ensure these patients are cared for appropriately and safely, we promote all blood results should be checked and acted upon within 12 h of the results are being available. We feel this is an acceptable time frame given there will be an evitable time lapse between the test being ordered, venesection and specimen being received by the laboratory. There will be situations when results need to be expedited much quicker and this decision lies with the doctors' clinical judgement.

The abnormal blood results not checked within 24 h could have potentially had an impact on patient safety and wellbeing.

However, no further clinical significance can be inferred from a single value outside normal parameters in isolation. All abnormal values need to be interpreted in context of the clinical situation and analysed in conjunction with other available results. The retrospective data collection did not include any verbal reports over the telephone between the laboratory technicians and doctors, that may have occurred if a grossly abnormal result was detected i.e. critically high potassium level. However, this method avoided any potential bias through the Hawthorne effect [2], when junior doctors could have modified their actions in response to being audited.

Electronic systems are now generally the standard in National Health Service hospitals but the software package used will vary within each Trust. They allow swift access to blood results but with multiple clinicians accessing results it can potentially be unclear where the responsibility for action lies [3]. Other potential reasons for junior doctors not checking blood results within an acceptable time frame include multiple clinical duties, lack of prioritisation, unfamiliarity with electronic systems and poor handover. Furthermore, from financial prospective blood tests should not be ordered without clinical justification, so if performed they all need to be reviewed.

The ultimate responsibility for patients' care lies with the consultant but it is the duty of junior doctors to manage patients safely on their behalf. Blood results in the Emergency Department are often checked by a middle grade doctor to pick-up any potential abnormalities that have not been acted upon. However, a study has concluded that the manual checking of all abnormal blood results is not worthwhile in that particular clinical setting [4]. It highlights the responsibility for reviewing results lies primarily with the requesting doctor so any abnormalities are not missed. We also advocate a similar practice on the acute surgical wards. This requires good communication and clarity about clinical responsibilities within the team structure. With dynamic working patterns a caveat to this is, if the result is not available at the end of a shift it can be handed over to a member of your team to check and act accordingly.

Our findings are a true reflection of clinical activity and time to checking blood results can be significantly improved. Firstly, all clinical members of staff must be fully informed of our new guidelines for promptly checking ordered investigations. This can be facilitated through hospital presentations, Trust e-mails, ward posters and during junior doctor induction. Secondly, iCare Software Program for patient health records has recently been introduced into our Trust, which generates electronic results that are sent directly to the patient's named consultant. This can be re-audited to assess whether highlighting the problem and implementing our changes have improved clinical practice.

## Conclusions

We propose that new guidelines are implemented, recommending all blood results on acute surgical wards are checked and acted upon within 12 h of the results being available or expeditiously if the clinical situation requires. This

will ensure patient safety and 'Good Surgical Practice' is maintained at a consistent level.

## References

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