Clinical audit — verifying transthoracic echocardiography reports

Mustafa Sherif

Abstract
Transthoracic echocardiography (TTE) is a key diagnostic and prognostic tool in a wide range of cardiac conditions. Referrals to the Cardiology Department at Nelson Hospital for TTE are received from various settings across the Nelson Marlborough District Health Board (NMDHB) including primary care, inpatient, and outpatient. This audit was undertaken to assess whether there are significant delays in verifying TTE reports by the Cardiology Department at Nelson Hospital. The primary objective was to determine the time taken to verify TTE reports, stratified based on severity of abnormalities. The results will inform actions required in the current process of verifying reports by the cardiologists at the hospital. Secondary factors that may impact on delivery of care or efficiency of TTE were also analysed to assess areas for further recommendations.

Introduction
Transthoracic echocardiography (TTE) is a key diagnostic and prognostic tool in a wide range of cardiac conditions.

Referrals to the Cardiology Department at Nelson Hospital for TTE are received from various settings across the Nelson Marlborough District Health Board (NMDHB) including primary care, inpatient, and outpatient. The 2017 Cardiac Society of Australia and New Zealand (CSANZ) guidelines for TTE recommend that the timeframe between referral for a TTE and the report being available to service providers depends on the urgency when triaged by a cardiologist into emergency, urgent, semi-urgent, or routine priorities.1 The bulk of NMDHB referrals are of routine priority which CSANZ suggests to be reported within three months of referral.3

<table>
<thead>
<tr>
<th>Urgency criteria triage</th>
<th>Inpatient</th>
<th>Example</th>
<th>Outpatient</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>Immediate</td>
<td>Emergency in Cath Lab</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Urgent</td>
<td>Within 1–2 days</td>
<td>Post STEMI</td>
<td>Within 14 days</td>
<td>Decompensated HF</td>
</tr>
<tr>
<td>Semi-urgent</td>
<td>Before discharge</td>
<td>post AVR</td>
<td>Within 4–6 weeks</td>
<td>New controlled SOB</td>
</tr>
<tr>
<td>Routine</td>
<td>As in- or outpatient</td>
<td>Clarification of murmur</td>
<td>Within 3 months</td>
<td>Stable AF, Stable murmur</td>
</tr>
</tbody>
</table>

Table 1: CSANZ triage urgency criteria.

Guidelines on the timeframe of TTE reporting based on urgency at triage, adapted from CSANZ appropriateness guidelines for adult TTE, March 2017: Cath = catheterisation; N/A = not applicable; STEMI = ST elevated myocardial infarction; HF = heart failure; AVR = aortic valve replacement; SOB = shortness of breath; AF = atrial fibrillation.2

The process to make the report available within the cardiology department at Nelson Hospital is as follows:
1. The referral is triaged based on indication and urgency
2. The TTE is performed by the sonographer
3. The sonographer reports the TTE and prints out the physical files
4. The reports are organised into groups based on urgency at triage and the sonographer’s severity findings
5. The cardiologist takes the physical reports and verifies them after reconciling it with the echocardiogram on the image viewer software, syngo, alongside the electronic patient records

Verification by a cardiologist involves reporting the findings and signing the report off to be put into the electronic patient records so that the report is available to NMDHB service providers.

The current process of verifying reports by cardiologists is tedious and contributes to unnecessary workload in the cardiology department. The final verification step takes approximately 20 minutes per patient. Although all TTEs are reported and made available within the recommended timeframes based on the CSANZ guidelines, there is room for improved efficiency within this process. With 4129 echocardiograms performed in NMDHB from 2017–2018 and similar numbers in previous years, it is prudent to seek means of easing this substantial workload in the cardiology department.

Aim
This audit was undertaken to assess whether there are significant delays in verifying TTE reports by the cardiology department at Nelson Hospital. The primary objective is to determine the time taken to verify TTE reports stratified based on severity of abnormalities. The results will inform actions required in the current process of verifying reports by the cardiologists at the hospital. Secondary factors that may impact on delivery of care or efficiency of TTE will also be analysed to assess areas of further recommendations.

Method
The audit was conducted as a retrospective review of TTE reports from 185 patients between 21 November 2019 and 21 February 2020. The reports have been evaluated for their date of referral, date of reporting, referral setting, technical quality of the echocardiogram, site of TTE, and severity of findings. The time taken to verify reports has been defined as the time between a TTE being performed by the sonographer and it being signed off by a cardiologist.

Findings
PRIMARY OUTCOMES
The primary outcomes highlight that around 90% of reports are reported within nine days of referral. All were reported well within the three months suggested by CSANZ. There is an apparent bimodal
distribution with a right skew in the time of verification. Thirty-five percent of reports are verified within 1–3 days, 40% of reports are verified within 5–8 days, and the times taper off after 10 days.

Figure 1: Distribution of time to verify TTE reports (n = 185).

SECONDARY OUTCOMES

Site of echocardiogram

- Wairau 78.9%
- Nelson 21.1%

Figure 3: Total TTE activity across hospital sites in NMDHB.

Referral setting

- Primary care 42.7%
- Cardiology 31.9%
- Oncology 16.2%
- Pre admissions group 11.4%
- Surgery 5.2%
- General medicine 4.2%
- Anaesthesia 1.8%
- Not stated 0.8%

Figure 4: Setting of referral for TTE in NMDHB.

Discussion

Areas of good practice:

- Reporting of TTEs falls well within recommended timeframes from CSANZ guidelines.
- One streamlined service is provided within the Nelson Hospital Cardiology Department across two sites. Distribution of TTE activity matches the 2017–2018 period: ~80% within Nelson Hospital and ~20% within Wairau Hospital.
- Indications are well documented at triage.

Recommendations:

- The majority of reports are verified within 10 days. However, 10% of reports exceed 10 days and 3% exceed 20 days to verification. These outliers reflect gaps in current reporting. Delays to verification attributed to non-electronic reporting include: poor organisation of physical copies of reports; lack of ordering by triage urgency and severity of abnormal findings; excessive piles of reports; lost and forgotten pieces of physical copies from cardiologists when taken from one setting to another; and the need for three systems of data by cardiologist to verify (physical TTE report, electronic patient records, and syngo). Alternative processes for verifying reports such as direct reporting on syngo could minimise times to verify reports.

- With 3.8% of referrals from an unstated source and 1.1% from the pre-admissions group (Figure 4), the specific department for these referrals should be sourced during triage.

Conclusion

The audit findings support the need for alternative means of verifying TTE reports. Streamlining reporting into one system (syngo) that is viewable in electronic patient records would increase the efficiency of reporting and ease workload. Although reporting by syngo is available, it is currently inaccessible in electronic patient records to different service providers.

References


About the authors

Mustafa Sherif is a Trainee Intern at the University of Auckland. He enjoyed his elective experience in Nelson where he observed cutting-edge technology utilised in interventional cardiology procedures. He has an early interest in research and finds contribution to the medical field by way of scientific exploration to be a rewarding venture.

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Conflict of Interest

Mustafa Sherif is the 2020 Academic Sub-editor for the New Zealand Medical Student Journal. This article has gone through a double-blinded peer review process applied to all articles submitted to the NZMSJ, and has been accepted after achieving the standard required for publication. The author has no other conflict of interest to declare.

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