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Improving timely medical reviews for patients discharged from intensive care

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Abstract

Transferring patients from the intensive care unit (ICU) to a general ward is commonly associated with error and adverse events, and is one of the most challenging and high-risk transitions of care. Patients discharged from ICUs often require sustained intensive multi-disciplinary team input, part of which can be provided by nurse or clinician-led outreach teams. Unfortunately, due to a lack of resources many institutions do not have such programmes. We work in one such hospital with no ICU outreach service for recently discharged patients.

We noted that a disproportionate number of patients recently discharged from the ICU needed acute medical reviews by on-call evening and overnight junior doctors. Furthermore we noted that many of these patients had not been reviewed by their medical team after having arrived onto the general ward from the ICU.

We aimed to foster a fundamental culture change within junior doctors to review patients within six hours of arrival onto a ward from the ICU. We introduced simple and low-cost interventions that included educational sessions for junior doctors and ward-based nurses, as well as posters that acted as visual reminders in relevant departments.

Overall, the number of patients discharged from the ICU to general wards that were reviewed within six hours improved from 22% to 70% in the space of six months. In the same period, the number of patients requiring an acute medical review by the evening or overnight on-call junior doctor dropped from 14% to 0%.

Whilst our project is not necessarily appropriate for many larger institutions that already have outreach teams in place, it is certainly applicable to other similar sized smaller hospitals. We hope that others who face the same inherent barriers are inspired to implement similar projects, to bring about positive change, and ultimately improve the safety of their patients.

Problem

We work in a 130-bed district general hospital in New Zealand, which is staffed by resident medical officers (RMOs) and consultants. Whilst there are no registrars in our hospital, the RMOs range in seniority with between one and four years of postgraduate experience. We noted that RMOs working evenings and overnight were being called to review a disproportionate number of general ward patients who had been recently discharged from the intensive care unit (ICU). These reviews were indicated for a variety of clinical reasons ranging from fluid and analgesia requirements to acute clinical deterioration. There are just two RMOs on site overnight who cover not only the wards, but also acute emergency department (ED) presentations. Due to the high workload in the ED, reviewing these high-risk patients was therefore often delayed, potentially jeopardising patient safety.

We noted that in most cases, patients were not reviewed by their regular team once they had arrived onto the general ward. We hypothesized that as a consequence of this inaction, such patients would be at a higher risk of deterioration and more likely to need an acute medical review by an evening or overnight on-call RMO, possibly necessitating re-admission to the ICU. Furthermore, the RMOs would be unfamiliar with these high-risk patients and their often-complex clinical background.

In many hospitals, patients discharged from the ICU will have a complete transition of care between the ICU and ward teams, with a formal handover process. However, our hospital operates an ‘open ICU’ policy, whereby patients are under joint care of the ICU team as well as the admitting specialist team. Both teams review each patient daily, with management decisions jointly made by both consultants. Many centres utilise various risk stratification tools, such as the Stability and Workload Index for Transfer and the Badawi and Breslow mortality tool to aid clinical decision-making regarding patient discharge from the ICU [1,2]. Currently, however, there are no such tools or criteria used in our hospital, with the decision to discharge patients dependent on the combined clinical judgement of the relevant consultants. When discharged from the ICU, each patient remains under the same specialist team under whom they were initially admitted, thereby providing continuity of care. The RMO for that team should therefore be aware of the management plan and any outstanding tasks. There is however, no formal handover process between the two teams, except for the verbal discussions that occur during the ward round. Furthermore, many hospitals operate a nurse or clinician-led outreach programme whereby patients discharged from the ICU to general wards are reviewed within a timely manner. In such situations,

potential concerns and clinical deterioration can be recognised early on and appropriately managed, thereby increasing patient safety and reducing potential harm. Unfortunately, due to a lack of resources there is no such programme in our hospital.

Background

Patients are usually discharged from ICUs on the basis of two important parameters. Firstly the condition of the patient and their need for on-going ICU support, and secondly the demand for ICU beds for other, more unwell patients [3]. They commonly have complex medical issues that have required intensive management, often with multiple life-saving interventions and treatments, and therefore once discharged to general wards, are at increased risk of deterioration and subsequent mortality [4,5]. This is especially true for patients discharged out of normal working hours [6,7].

The transition of care from the ICU to general wards is commonly associated with error and adverse events, and is one of the most challenging and high-risk transitions of care [8]. These events include sepsis, hospital-incurred injury, adverse drug reactions, cardiac or respiratory arrest, and unexpected death and can affect up to 30% of patients [9,10]. This is partly due to the fact that patients are being transferred from a resource intensive environment to one where resources and staff are more limited [4,11]. Patients discharged from ICUs often require sustained intensive multi-disciplinary team input, part of which can be provided by nurse or clinician-led outreach teams. Use of such teams seems to have improved patient survival post transfer and may help reduce readmission rates [12].

The National Institute for Health and Clinical Excellence (NICE) has published guidelines concerning the transfer of patients from ICUs to general wards, specifically recommending that patients should be discharged from the ICU between 0700 and 2200, and that any transfers occurring outside of these hours should be regarded as a critical incident [13]. Furthermore they recommend that the ICU team and receiving ward team should take shared responsibility for care of the patient being transferred, and that this should be facilitated by a formal structured handover process [13]. They do not, however, specify standards for medical reviews of patients post transfer. Morris & Saddler [14], however, propose that 100% of all discharges from ICU should be reviewed by medical teams within six hours of arrival onto the ward, to aid early recognition of potential concerns and clinical deterioration.

Baseline measurement

An initial retrospective audit was completed using all ICU discharges during a six-month period in 2014. The primary outcome measure was medical review of patients by an RMO within six hours of arrival onto a general ward. Secondary measures included the number of patients requiring an acute medical review by the evening or overnight on-call RMO, and re-admission to the ICU within seven days. Patients who were discharged directly home, transferred to another hospital or died whilst an ICU patient were excluded from the study (n= 51).

Of the 138 patients discharged to general wards, 30 (22%) were reviewed by an RMO within six hours. Of these 30 patients, 2 (7%) still required an acute medical review by the evening or overnight on-call RMO. One patient developed chest pain, whilst the other complained of nausea and vomiting. 0 patients (0%) reviewed within six hours required readmission to the ICU within seven days.

Of the 108 patients (78%) who were not reviewed by an RMO within six hours, 17 (16%) required an acute medical review by the evening or overnight on-call RMO. These reviews were indicated for a variety of clinical reasons ranging from fluid and analgesia requirements to acute clinical deterioration. 2 of these 108 patients (2%) were readmitted to the ICU within seven days.

See supplementary file: ds5967.xlsx - “Baseline Measurement Data”

Design

When considering this problem, it was felt that the key stakeholders were the RMOs, and as such the solution lay with them. Since there are no registrars at our hospital, RMOs act as a direct link between patients and their consultants, and are the first port of call for any medical issues. We used one of the weekly RMO teaching sessions to present the baseline data and discuss the benefit of medical reviews within six hours for patients discharged from the ICU. We used the data as a rationale for adopting this modification in practice, and attempted to foster a fundamental culture change from the RMOs, who were, up until this point, not familiar with these recommendations. 80% of RMOs attended the session, and through informal face-to-face discussions, we alerted those who were unable to attend, of the new recommendations. We supplemented these actions by placing posters in the ward doctors’ offices, to act as a visual reminder for the RMOs. We felt that these low-cost interventions would be both effective and sustainable in the long-term.

Strategy

PDSA cycle 1: Three months after implementing the initial intervention of RMO education and posters described previously, data were collected for the same outcomes as in the baseline measurement. The results, presented below, revealed a marked improvement in medical reviews of patients by an RMO within six hours of discharge from the ICU. The results also demonstrated a vast reduction in the number of patients requiring a medical review by the evening or overnight RMO, as well as a reduction in the number of patients requiring readmission to the ICU. We presented these findings to the RMOs during our daily morning handover and asked for feedback regarding further improvements. Through these discussions, it became apparent that one of the limiting factors was that the RMOs were not aware of patients arriving onto the wards and therefore were not aware that a review was needed.

PDSA cycle 2: Based on the feedback received from the RMOs, it was evident that we had overlooked the role of the ward nursing staff in ensuring that these medical reviews occurred in a timely

manner. We therefore held educational sessions for the ward nurses to present our findings and highlight the importance of medical reviews for patients recently discharged from ICU, asking them to send a text page to the relevant RMO once patients had arrived onto the ward. We held three meetings within a two-week period in each ward, in an attempt to engage as many of the ward nurses as possible. This was supplemented by informal discussions with nursing staff when members of the quality improvement team were working on the ward. Furthermore, we placed the posters developed during the first cycle into the ward care stations, to act as visual reminders to nurses to bleep the relevant RMO. After a further three months elapsed, data collection was repeated, with results once more demonstrating much-improved outcomes.

PDSA cycle 3: Whilst demonstrating markedly improved results during this project, further improvements can still be made. During informal discussions with ICU nurses, it became apparent that they were unaware of this project and our attempts to ensure patients were reviewed by an RMO within six hours of discharge. We have therefore planned further educational sessions with ICU nurses, and are designing a sticker that the ICU nurses can place into the patient notes prior to discharge to the ward. This sticker is designed to be a visual reminder to ward nurses to contact the relevant RMO once the patient has arrived onto the ward. Additionally, work is underway designing a written patient care plan proforma for patients being discharged from the ICU. Once these interventions have been implemented, data will be re-collected to ascertain whether there has been any positive effect. Furthermore, to ensure the long-term sustainability of the project once the current team have moved on to work in other hospitals, junior RMOs have been recruited to the quality improvement team to ensure that standards are kept and further improvements made.

Results

PDSA cycle 1: Patients who were discharged directly home, transferred to another hospital or died whilst an ICU patient were excluded from the study (n= 26). Of the 42 patients discharged to general wards, 19 (45%) were reviewed by an RMO within six hours. Of these 19 patients, none (0%) required an acute medical review by the evening or overnight on-call RMO. No patients (0%) reviewed within six hours were readmitted to the ICU within seven days. Of the 22 patients (52%) who were not reviewed by an RMO within six hours, none (0%) required an acute medical review by the evening or overnight on-call RMO. No patients (0%) were readmitted to the ICU within seven days.

PDSA cycle 2: Patients who were discharged directly home, transferred to another hospital or died whilst an ICU patient were excluded from the study (n= 12). Of the 40 patients discharged to general wards, 28 (70%) were reviewed by an RMO within six hours. Of these 28 patients, none (0%) required an acute medical review by the evening or overnight on-call RMO. No patients (0%) reviewed within six hours required readmission to the ICU within seven days. Of the 12 patients (30%) who were not reviewed by an RMO within six hours, none (0%) required an acute medical review by the evening or overnight on-call RMO. No patients (0%) were readmitted to the ICU within seven days.

Overall, the number of patients discharged from the ICU to general wards that were reviewed by an RMO within six hours, improved from 22% to 70% in the space of six months. In the same period, the number of patients requiring an acute medical review by the evening or overnight on-call RMO dropped from 14% to 0%. Furthermore the number of patients readmitted to the ICU within seven days fell from 2% to 0%. Whilst these figures compare well to previous studies that quote between 4-13.7% readmission rates internationally [12,15,16], and between 4.5-5.1% in Australia and New Zealand [17], it is difficult to truly compare these figures due to inherent differences between hospitals, such as ICU bed-occupancy rates, open versus closed ICU policies and availability of clinical outreach teams.

See supplementary file: ds5994.docx - “Table Of ICU Discharge Data”

Lessons and limitations

We learnt a number of important lessons during this project, none more so than the need to identify all relevant stakeholders at an early point in the quality improvement process. In hindsight, had we identified the vital role of both ward-based and ICU nursing staff in the application of this project, our results may have demonstrated much earlier and likely more dramatic improvements. We would urge others attempting similar projects to think carefully about the key stakeholders and look to recruit them early in the process.

A key limitation of this study is that it was conducted only over a six-month period, and as such its sustainability is, as yet, untested. With many junior doctors rotating through different hospitals there is a risk that projects like ours lose momentum and are not carried forward. It is for this reason that we have recruited junior RMOs who will continue to work at the hospital next year, to the quality improvement team and new RMOs will need to be recruited yearly to ensure the sustainability of the project. We are also currently attempting to recruit a permanent member of the ICU staff into the team.

Another limitation of this study is the limited outcome measures. When designing the study, our main objective was to reduce acute medical reviews by on-call staff and readmission into the ICU. In hindsight however, we could have measured mortality as an outcome, thereby ascertaining whether timely medical reviews post discharge from the ICU improves survival to hospital discharge. We have included this measure in our next PDSA cycle. Ideally, we would have also liked to collect data regarding demographics and co-morbidity status, to further evaluate trends in this transition of care. Unfortunately due to limited time and resources we have not currently included this subset of data.

One key barrier to achieving timely medical reviews of patients discharged from the ICU, is that our hospital does not have the resources to make an ICU-led outreach team a viable cost-effective long-term option. In this context, it is therefore even more vital that we continue attempts to bring about fundamental culture change amongst hospital staff, involving all key stakeholders in the process. If key stakeholders are not educated regarding the benefits of the

project, then sustainability in the long-term will be difficult to maintain. Therefore, following completion of the next PDSA cycle, we are presenting our data to hospital consultants during a grand round meeting, to encourage them to ensure timely reviews for their patients that have discharged from the ICU. Thus far, we have not explored the views of the patients themselves or families regarding this initiative.

Conclusion

As noted previously, the transition of care for patients from the ICU to general wards is challenging and risky and can be associated with error and adverse events. Whilst many hospitals have the resources to operate ICU-led outreach teams that help mitigate the potential difficulties of these transitions, many institutions do not.

We have demonstrated that simple low-cost interventions can markedly improve care for patients being discharged from the ICU. By introducing the concept of medical reviews within six hours, we have markedly reduced the number of acute medical reviews required by evening and overnight RMOs in our hospital. This has not only improved care for the patients discharged from the ICU, but also frees up on-call RMOs to attend to other unwell patients.

Whilst our project is not necessarily appropriate for many larger institutions that already have outreach teams in place, it is certainly applicable to other similar sized hospitals. We hope that others who face the same inherent barriers are inspired to implement similar projects, to bring about positive change, and ultimately improve the safety of their patients.

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Declaration of interests

Nothing to declare

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Ethical approval

Ethical approval was not required for this project, as per local guidelines which deemed this work an improvement study.