

4493: Does the implementation of a QI care bundle increase the incidence of direct post-operative critical care admission in patients undergoing emergency laparotomy?



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Background

- High risk emergency surgery. (1,2,3)
- Often present with significant co-morbidity, not optimised prior to surgery.
- Improvements still required for direct admission to critical care.

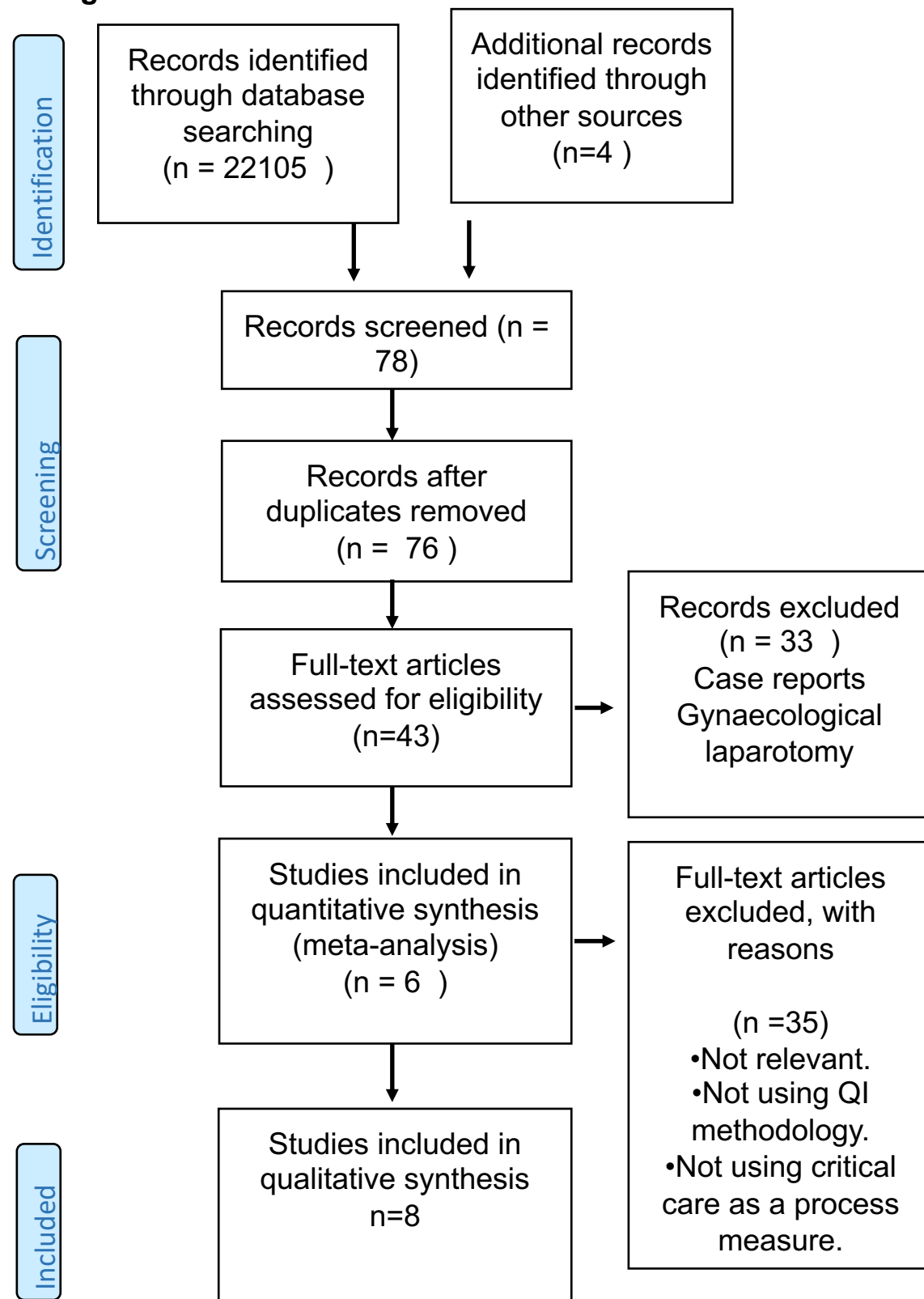
Aim

- The aim of this review is to establish whether the implementation of a quality improvement care bundle increases the incidence of direct post-operative critical care admission for patients undergoing emergency laparotomy?

Methods and Materials

- This systematic review was registered with the PROSPERO database **193303**.
- The literature search was performed using Embase (a registered trademark of Elsevier B. V), Medline (U.S library of Medicine) and Web of Science.
- Search criteria **emergency laparotomy, care bundles and critical care admission** were included.
- The search was restricted to publications relating to humans from 2010 onwards, age >17 years at time of operation.
- The last complete database search was January 6th 2020.

PRISMA Flow Diagram



Key studies

First author	Critical care admission
Huddart et al. (4)	• Critical care admissions statistically significant increase in ¾ sites.
Peden et al. (5)	• Improvement in critical care admission (65% versus 69%) No statistical test performed
Tengberg et al. (6)	• 24.3% admitted direct to critical care in the intervention group compared with 21.8% in the control group. • PACU 38.5% patients were admitted to PACU first, as they fulfilled the criteria ASA >2 and surgical APGAR score < 5.
Møller et al. (7)	• 41% patients were admitted to critical care. No documented baseline data .
Vester-Andersen et al. (8)	• 16% were admitted to critical care immediately post-operatively. 77% of these were admitted direct to critical care. 23% were admitted via the PACU. • 84% discharged for ward care. 30-day mortality 14.3%. • 4.8% of patients having standard ward care were subsequently admitted to ICU. • Admission to the standard ward care was associated with a higher mortality at 30 days.
Aggarwal et al. (9)	• Admission rate to the critical care unit before the QI project was 62.9% compared with 71.5% (peak post implementation). No statistical test performed.

Results

- 22105 papers were identified using the primary electronic database search.
- Following restrictions 78 were retained.
- A further 43 underwent review of the abstract and full text.
- Eight studies were deemed eligible for data analysis.
- Six quality improvement initiatives using care bundles or pathways of care were identified for analysis .

Discussion

Does a documented risk assessment improve direct admission to critical care?

- Risk assessments are used as a marker for good quality care.
- EPOCH 4,893 (66%) of patients received a documented risk assessment in the intervention arm compared with 4,570 (55%) in the usual care group.
- Those patients in the intervention arm correlated with an increase in planned admission to critical care following EmLap (65% versus 69%). (5)
- Smaller studies have also demonstrated improvements in direct critical care admission when risk assessments are performed as part of a “laparotomy pathway” or by using a “Boarding Card” prior to surgery. (10,11)
- Documented and objective evidence that patients are at high risk of perioperative morbidity and mortality.
- An objective risk assessment empowers clinicians to highlight patients about whom surgeons and anaesthetists should have an open and collaborative dialogue with the intensive care physicians regarding the appropriateness of critical care admission.

Does early antibiotic administration improve direct admission to critical care?

- EmLap QI project was conducted by Huddart and colleagues implemented the EmLap QI care bundle (ELPQuIC). (4)
- The EmLap pathway showed improvements in the delivery of antibiotics, time to theatre, surgical and anaesthetic consultant presence and critical care admission. Crude mortality documented prior to the emergency laparotomy pathway at 30 days decreased from 14% (95% CI 10.1 - 18%) to 10.5% (95% CI 7.6 – 13.5%).
- The increase in antibiotic prescription correlated with an increase in the admission of EmLap patients to critical care across all sites.
- An increase in critical care admission has occurred because screening for sepsis is undoubtedly acting as another objective risk assessment tool

Does consultant-led decision-making improve direct admission to critical care?

- Timely and high quality decision making is one of the most valuable elements of care aimed at ensuring a satisfactory perioperative outcome.
- Consultant presence delivers a wealth of experience which translates into rapid decision-making and thoughtful application of clinical acumen, even in complex scenarios where multiple factors influence the choices available.
- EPOCH demonstrated improvements in consultant presence. This was reflected by increase in the consultant decision-making for both consultant surgeon presence (85% versus 88%) and anaesthetic consultant presence in the operating theatre (76% versus 79%). This correlated with an increase in direct admissions to critical care following EmLap. (5)
- EPOCH’s methodology focussed on stakeholder engagement. Each hospital had a senior clinicians providing the basis for QI leads. For the QI methodology to be successful, implementation must be well led and engage team members in the process. There was significant heterogeneity in the uptake of the EPOCH measures across participating sites. When comparing this with the work by Huddart. it is clear that the success of their QI initiative was founded on stakeholder buy-in and belief that change in the uptake of the five process measures would have an impact on mortality. (4,5)
- Consultants are the key enablers on the shop floor.
- Their presence is the first step toward cultural and behavioural changes in the perioperative pathway to develop and maintain the success of QI initiatives.

Are PACU’s the answer for forward planning of critical care admission following emergency surgery?

- Enhanced care areas promoted by ICS to support level 1.5 care
- Tengberg and colleagues have highlighted the importance of allowing time for the intensive care physician time to forward plan critical care admissions. Utilise PACU to allow time prior to critical care admission. (6)

Conclusions

- Care bundles standardize care for emergency laparotomy.
- Patient needs are not homogenous.
- Simple interventions that achieve cumulative marginal gains for this emergency surgical population must be crafted to fit the individual hospital’s need.
- Those QI initiatives that have demonstrated the greatest success have had stakeholder buy-in across the hospital community with ongoing education and support for QI leads.
- This review has highlighted the importance of such pathways in optimizing patient care and critical care resource utilization.

“Should all EmLap patients be admitted direct to critical care?”

References

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