Abstract:

Background

Enhanced recovery after surgery (ERAS) pathways are proven across many different surgical procedures to expedite post-operative recovery. ERAS pathways have led to a reduction in hospital length of stay and surgical complications. However, improvements are still possible, especially in post-operative ERAS components delivered by nurses such as early mobilisation and oral feeding. This article summarises the current role of nurses within ERAS, the possible future roles for nurses, and highlights recommendations for future research within ERAS.

Discussion

Currently, nurses are the professional group that spend the most time with patients throughout the peri-operative pathway and are recognised as playing a vital role in delivering many of the components of an ERAS pathway. They frequently coordinate care across disciplines and ensure that the continuity of patient care is maintained. However, there is paucity of nursing specific ERAS research compared to other professional groups.

In the future, continual staff training on ERAS will be required to ensure highly trained nurses and the best possible ERAS implementation. In certain types of surgery, nurses may take on extended roles in the postoperative period, such as taking over responsibility and leadership for coordinating pain management, mobilisation and discharge. However, this will require a well-defined care program, clear definition of nursing responsibilities from

surgeons, agreed discharge criteria, and highly qualified nurses, along with the collection and analysis of data to prove the safety and efficacy of such practice development.

Conclusion

Increasing nursing involvement in ERAS research is therefore vital to help drive future improvements to patient care and the development of nursing roles. Nurses will need to have a major role in the preoperative clinic, the early postoperative phase as well as in the follow-up post-discharge period, where the real benefits of ERAS need to be further documented.

Clinical Relevance

The paper outlines the current and possible future roles for nurses within ERAS pathways, and identifies priorities for future research areas which nurses should be encouraged to investigate

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1. Introduction

Enhanced recovery after surgery (ERAS), or 'fast-track' pathways are well-established across a wide range of surgical procedures and demonstrate consistent success in decreasing surgical stress, maintaining physiological homeostasis and expediting post-operative recovery (Ljungqvist et al., 2017). The implementation of ERAS has successfully reduced hospital length of stay and surgical complications, so the focus is now to accelerate post-discharge functional recovery and rehabilitation (Kehlet, 2020a). Thus, incomplete post-operative recovery, such as residual cognitive impairment, sarcopenia and chronic pain will limit the restoration of health and may increase the risk of long-term morbidity (Kehlet, 2020a; Myles, 2020).

To help implementation, the ERAS Society® guidelines, that integrate evidence-based practices into multimodal care pathways, have been published in multiple surgical specialties (The ERAS Society®, 2020), causing each profession within the surgical team, including nursing to reconsider their roles and best-practice. Nonetheless, the areas of post-operative recovery on the ward and post-discharge rehabilitation are still to be clearly defined in many clinical guidelines.

The success of ERAS is reliant upon fulfilment of the clinical protocol and buy-in from all professions involved in the surgical journey. However, in studies evaluating adherence to

ERAS components, poor compliance to protocols is mostly observed in components of care that are delivered once patients have returned to the ward (Roulin et al., 2017; Aarts et al., 2018). For example, despite the widely recognised importance of early mobilisation as part of ERAS programmes, compliance to mobilisation goals has been reported to be suboptimal in studies of systematic ERAS implementation (Maessen et al., 2007; Kehlet, 2018).

The relative low adherence to ward-based elements of ERAS pathways that are delivered by nurses, is echoed by the relatively low level of nursing specific research within the field of ERAS. Up until the end of 2020, there were 3278 articles published within the PubMed database that draw attention to ERAS or fast-track surgery. However, when ERAS search terms are combined with the nursing MeSH term, just 94 articles were yielded (Figure 1). Nurses, whilst widely recognised as being central to the ERAS concept, therefore face a challenge to not only improve the implementation of ERAS pathways, but also to contribute to future research that will further improve patient care. This article will therefore summarise the current role of nurses within ERAS, their possible future roles, and highlight recommendations for future research within ERAS.

2. **The current role of Nurses**

The ERAS concept is based on close interdisciplinary collaboration between surgeons, anesthesiologists, nurses, and Allied Health Professionals. Each profession has its specific tasks and an essential role in contributing to compliance and sustainability of the evidence-based clinical guidelines.

Generally, the nurses are the professional group that spend the most time with the patients and thus have a vital role and importance for implementing and maintaining the ERAS program. Furthermore, they are often in charge of coordinating activities across the various professional groups involved and ensuring that continuity in patient care is maintained. For the implementation of ERAS to be successful, nurses are vital to provide pre-operative education, perioperative care, and to facilitate post-discharge pathways, as well as coordinating the collection of outcome measures (Brady et al., 2015).

In addition to providing the fundamentals of care such as; providing information to patients and their families; motivating and involving the patients as active participants within their treatment; helping to ensure early nutrition and mobilisation following surgery and aiding patients to prepare for discharge and rehabilitation at home. Nurses are essential to ensure effective pain treatment and discontinuation of invasive equipment as early as possible to enable early and intensified mobilisation and they have a vital role in the monitoring and management of post-operative pain (Balfour et al., 2019).

There are three main categories of nurses, which all have an important function in terms of achieving a successful ERAS course. The largest group are the frontline staff, who are the ones with the daily (24/7) contact and care of the patients. The second significant nursing group is the ERAS nurses whose specific role is to be a facilitator of implementation the ERAS program with focus on compliance and clinical auditing of ERAS data, staff education, patient and staff support throughout the ERAS pathway, post-operative patient support and project management (Balfour et al., 2019; Watson, 2017).

The third essential group is the nursing leaders whose role is to create the right environment needed for the ERAS concept such as organisational initiatives, employment and securing the necessary nursing resources and qualifications as well as progression, development of evidence based care and creating a culture of safety (Brown and Xhaja, 2018).

3. The future role of nurses

Poor compliance to ERAS protocols in the postoperative period is a challenge that needs to be addressed across all surgical procedures (Roulin et al., 2017; Aarts et al., 2018; Kehlet, 2018) and it has been shown that improved adherence to the ERAS protocol is significantly associated with improved clinical outcomes (Gustafsson et al. 2011). One solution is to ensure highly trained nurses. Aiken et al. (2014) showed, that nurse education as well as better patient-to-nurse ratios is significantly related to lower mortality rates. Thus, highly qualified nurses are a prerequisite for a successful ERAS patient course, and continual staff training is required to secure the best possible ERAS implementation (Francis et al., 2018). Motivation and behavior change are achieved primarily by understanding the "why" ERAS makes a major difference to the patient's recovery. A thorough introduction to the evidence behind ERAS programs as well as the results is required. The frontline staff should be prioritised and qualified as they have close patient contact throughout the day and thus have the greatest impact on patient care. However, the basic introduction to ERAS principles

and evidence is still not sufficiently implemented in the educational institutions for nurses and for allied health professionals.

It has been shown that in certain types of relatively uncomplicated surgery, nurses may be allowed to take over tasks from surgeons in the postoperative period, for example in total hip and knee arthroplasty, where nurses gained responsibility for pain management, mobilisation and discharge (Specht et al., 2015). However, this requires a well-defined care program with clear discharge criteria and high-qualified nurses to manage the tasks. In addition, an explicit agreement on nursing roles and responsibilities will be required from surgeons that is based upon a well-defined care structure and indications for when clinical decision making should be escalated (Specht et al., 2015).

As a consequence of the shorter hospital stay, nurse-led outpatient clinics will become more widespread in the future for follow up and support the patients after discharge. As an example, a short hospital stay after breast cancer surgery can be successfully carried out with the same high patient satisfaction compared with a traditionally significantly longer hospital stay (Carli et al., 2020). This may be achieved by the introduction of a nurse-led clinic where the physical issues and the psychosocial care are been taken care of (Duriaud et al., 2018).

In addition to the above-mentioned examples of the efficiency and the task changes for the nurses, they will also have an important role to identify and focus on those patients whose frailty and/or co-morbidities, that may prevent a short-standardized patient course. Resources and interdisciplinary efforts are needed to ensure the best possible recovery for

this vulnerable group of patients with ERAS principles considering the individual needs of the patients. Thus, future surgical nursing care is divided into same-day surgery, short hospitalizations and longer hospital stay for patients with special needs, which requires a targeted training of the surgical ERAS nurse to ensure highly qualified nursing care.

4. Recommendations for future research

- It shall be emphasised that fast-track surgery or enhanced recovery programs have three phases: preoperative, intraoperative, and postoperative. More focus has to be made on the concept of prehabilitation, although the updated results are a little disappointing (Carli et al., 2020) probably because the outcomes have been assessed as general composite outcomes and not with regard to those outcomes potentially to be improved by prehabilitation per se (Kehlet, 2020b). Importantly, future research should also focus on further development of intra- and postoperative items of ERAS protocols and where implementation of evidence-based factors needs to be improved (Kehlet, 2018). Specifically, future studies should focus on optimal intra- and early postoperative haemodynamic management, opioid-sparing multimodal analgesic strategies (Joshi & Kehlet, 2019), early mobilisation and oral nutrition where nursing care is crucial. Regarding compliance and sustainability of the evidence-based clinical guidelines, more research is needed, such as studies with benchmarking, knowledge sharing and "learning from the best". This “learning” relates to not only the clinical content of the ERAS program, but also the enabling organisational and cultural factors. It is important how care is organised and

delivered. For example, understanding how the daily tasks are planned, the ratio of nurses per bed in daytime, evening and night, and the organisation of preoperative information and postoperative follow-up. The importance of a supportive organisational culture, continuous teaching of the evidence behind the ERAS principles, and a focus on data / outcome are also essential.

However, so far ERAS principles have mostly dealt with early recovery, i.e. the hospital stay. We need to change the focus on post-discharge recovery where limited studies are available (Kehlet, 2020a). In this context, a major issue will be the potential difference between patient-reported outcomes and objective measurement of functional abilities (Kehlet, 2020a). In addition, we need more detailed studies in different patient groups such as high-pain responders (pain catastrophisers and preoperative opioid users) and "high" verses "low" inflammatory responders (Kehlet, 2020a). Thus, the intensity of the postoperative inflammatory response seems to be related to delayed recovery, but with a large inter-individual variation (Gaudillière et al., 2014). Furthermore, with regards to post-discharge rehabilitation, we have to separate between different patient groups such as those who want to continue postoperative sports activities verses the preoperative very frail, malnourished participants with reduced muscular function versus a third group of those who may not participate in their physiotherapy program.

Experience from implementation of ERAS programs over the past 25 years has shown that well-described care programs with detailed daily goals for care are of major importance for both the implementation and maintenance of the evidence-based care programs. The future specific nursing research should therefore address compliance with the ERAS program in relation to outcome such as complications and length of stay. An essential area

of research with focus on post discharge recovery need for support based upon further optimise care by listening to the needs of patients.

There is still a lack of a nursing culture where data on basic nursing is available. Experience with audit data for use in quality development has proven to be effective and motivating for nurses to change behaviour (Hjort Jakobsen and Kehlet, 2020). Consequently, regular auditing of patient recovery should be routine to ensure the maintenance of good care quality as well as serving as a basis for nursing research.

5. Summary

ERAS is a multi-modal and team-based approach where nurses are recognised to have vital caring, co-ordinating, and leadership roles. However, despite this well-established and recognised role, nursing involvement within ERAS research has been limited to date. This paper highlights that improvements to nursing related ERAS care components are possible, and that there are exciting opportunities for developing new roles for nurses within future ERAS pathways. What is clear, is that as the process for developing and improving ERAS continues, nurses will need to have a major role both in the preoperative clinic, in the early postoperative phase as well as in the follow-up post-discharge period where the real benefits of ERAS need to be further documented. To do this, future nursing research in these areas and the subsequent dissemination of practice developments must be encouraged and championed.

Clinical Resources

National Institute of Clinical Excellence - https://www.evidence.nhs.uk/search?om=[{%22ety%22:[%22Guidance%22]}]&q=enhanced+recovery&sp=on

American Association of Nurse Anesthetists - https://www.aana.com/practice/clinical-practice-resources/enhanced-recovery-after-surgery

Enhanced Recovery after Surgery Society - https://erassociety.org/

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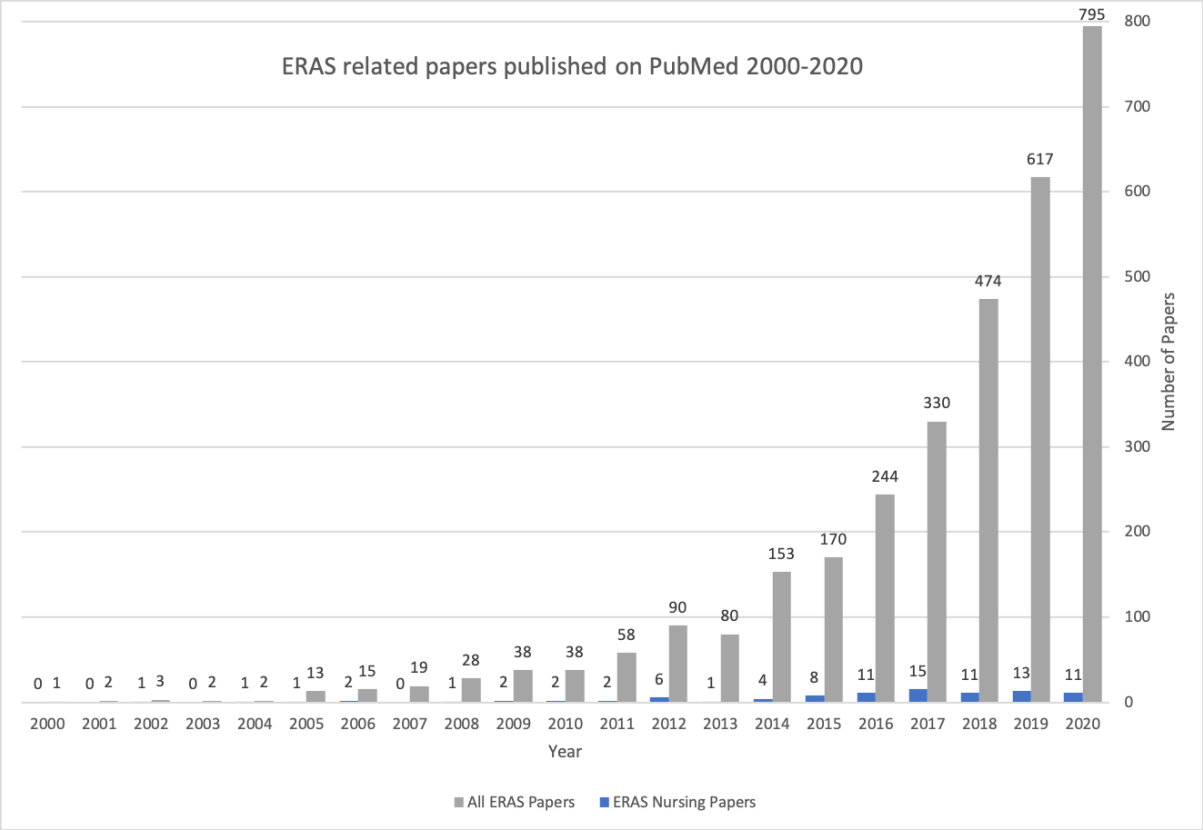
Figure 1. ERAS related papers published on PubMed 2000-2020



1. All ERAS Papers (Search terms "enhanced recovery after surgery" or "fast track surgery")
2. ERAS Nursing Papers (Search terms "enhanced recovery after surgery" or "fast track surgery" AND Nurses)