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REVIEW ARTICLE

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# Implementation of an enhanced recovery after surgery protocol for head and neck cancer patients: Considerations and best practices

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## Abstract

Enhanced recovery after surgery (ERAS) protocols have been developed in numerous surgical specialties as a means of systematically improving patient recovery, functional outcomes, cost savings, and resource utilization. Such multidisciplinary initiatives seek to minimize variability in several aspects of perioperative patient care, helping to reduce inpatient length of hospital stay, complications, and the overall resource and financial burden of surgical care. Head and neck oncology patients stand to benefit from the implementation of comprehensive ERAS protocols, as these patients have complex medical needs that may dramatically impact multiple aspects of their recovery, including breathing, eating, nutrition, pain, speech, swallowing, and communication. Implementing ERAS protocols for head and neck cancer patients may present unique challenges, and require significant interdisciplinary coordination and collaboration. We therefore sought to provide a comprehensive guide to the planning and institution of such ERAS systems at institutions undertaking care of head and neck cancer patients. Key elements to consider in the implementation of successful ERAS protocols for this population include organizing a team consisting of frontline leaders such as nursing staff, medical specialists, and associated health professionals; designing interventions based on systematically evaluated, high-quality literature; and instituting a clear methodology for regularly updating protocols and auditing the success or potential limitations of a given intervention. Potential obstacles to the success of ERAS interventions for head and neck cancer patients include challenges in systematically tracking progress of the protocol, as well as resource limitations in a given health system.

**KEYWORDS**
enhanced recovery after surgery, ERAS, head and neck, oncology, quality improvement

**Highlights**

- Enhanced recovery after surgery protocols have been developed in numerous surgical specialties.
- Head and neck oncology patients may benefit from ERAS given complex medical needs.
- Keys to ERAS success include a multidisciplinary team, evidence-based protocols, and re-evaluation.

## BACKGROUND

A lack of comprehensive perioperative care has been associted with worse outcomes in surgical patients, as well as increased strain on the healthcare system.[1] In particular, perioperative complications have been directly associated with decreased long-term survival following major surgeries.[2] In light of this finding, enhanced recovery after surgery (ERAS) protocols have been developed as a way to systematically improve patient recovery, outcomes, cost savings, and healthcare resource utilization. ERAS is a multidisciplinary initiative that addresses multiple aspects of patient care in a stepwise manner, ranging from outpatient preadmission check-ups to postoperative recovery. ERAS was first developed as a method for managing patient care in colorectal surgery, and has since been adopted by a variety of other surgical specialties.[1,3–6] Data regarding ERAS protocols have consistently demonstrated their efficacy in reducing inpatient length of stay, complication rates, and the financial burden on patients.[7–11] Longer-term studies have also demonstrated significantly decreased postoperative patient mortality rates following implementation of ERAS systems.[12,13]

Taken together, the published literature supporting ERAS protocols strongly suggests their efficacy in a variety of surgical fields. Head and neck oncologic patients stand to uniquely benefit from such centralized, multidisciplinary protocols.[14–17] These patients have a variety of needs given the complexity of their surgical and medical care, which may affect multiple facets of their recovery, including breathing, eating, nutrition, pain, speech, swallowing, and communication. In the approach to such patients, a multidisciplinary effort is crucial; implementation of an ERAS protocol presents a viable avenue through which such care could be streamlined and optimized.

Consensus-based ERAS protocols for patients undergoing head and neck cancer surgery and free-flap reconstruction have been previously presented in the literature.[18,19] However, there has been a lack of consensus and clear delineation regarding how to implement such protocols at one's own institution. Further, implementation of novel multimodal protocols may present major challenges in provider and patient adherence; attempting to modify standards of perioperative care has often been met with significant resistance and reluctance.[20,21] Thus, our aim is to supplement existing literature by describing the necessary components and considerations needed to successfully implement a multimodal perioperative protocol for head and neck cancer patients. Herein, we provide a comprehensive description of ERAS planning and initiation, which can serve as a useful guide for other departments and care facilities (Figure 1).

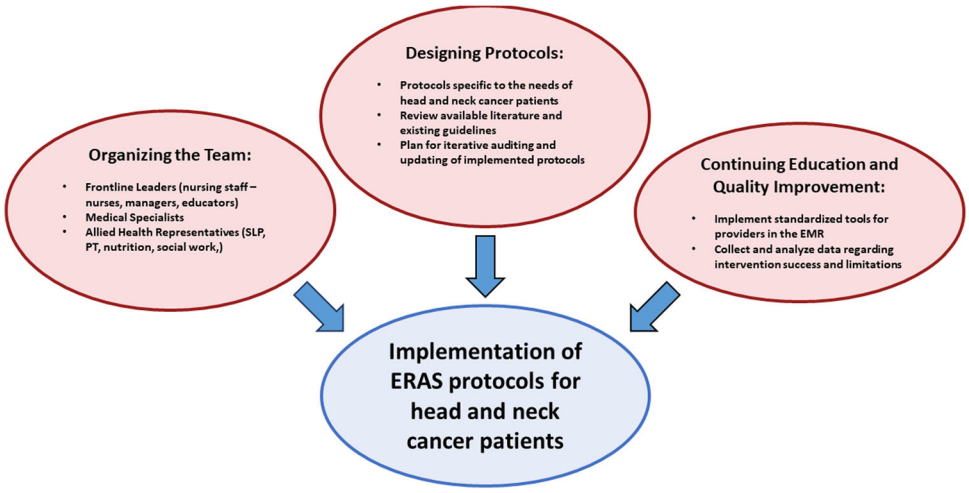


**FIGURE 1** Key points for successful development and implementation of enhanced recovery after surgery (ERAS) protocols for head and neck cancer patients. EMR, electronic medical record; PT, physical therapy; SLP, speech and language pathology

## ORGANIZING THE TEAM

Curating and organizing a comprehensive care team for head and neck oncology patients is paramount in ensuring that an ERAS protocol is set up for success. A diverse team of relevant stakeholders from head and neck oncologic surgery, anesthesiology, nursing, physical therapy, occupational therapy, nutrition, speech and language pathology, pain medicine, and any other relevant health groups should be recruited. Each team member plays a pivotal role in the perioperative care for this particular patient population. Studies have illustrated that not all institutions utilize each component of proposed ERAS guidelines, perhaps in part due to limitations in available resources.[17] The purpose of having this multifaceted team in place when developing a protocol at one's institution is to determine which parts of previously published ERAS guidelines may be suitable for implementation in their unique healthcare setting. Additionally, this provides an opportunity for all care team members to discuss any questions or concerns regarding proposed guidelines and provide alternatives that may be more suitable for their practice. This team should not only propose a set of agreed-upon guidelines, but establish a plan for auditing and revisiting new guidelines in an iterative fashion as they are rolled out.

### Frontline team leaders

As with a host of other perioperative interventions, frontline team leaders, such as nursing staff, play a critical role in successfully implementing multiple aspects of ERAS protocols, as nursing team members are heavily involved in direct care delivery to head and neck cancer patients. These frontline team members can therefore remind other staff members of new care procedures, facilitate continuing education among staff, monitor efficacy, and perform data collection. Key leaders can be assigned according to inpatient, outpatient, and perioperative settings. On the inpatient side, this would typically include the intensive care unit (ICU) nurse manager and floor nurse manager. In the outpatient setting, this could be either a nurse navigator or a presurgical nurse educator. Lastly, on the perioperative side, this would be the nurse manager for the preoperative and postanesthesia care units. Each of these three locations have distinct roles in the care of a patient. Therefore, enlisting frontline support, knowledge, and feedback from each of these care settings is important for the successful implementation of an ERAS protocol.

### Medical specialists

At the level of physicians and advanced practitioners, leaders from a variety of specialties should be recruited for input to and maintenance of an ERAS protocol. Specifically, individuals from anesthesiology, pain medicine, infectious diseases, and head and neck oncologic surgery should play central roles in the program's development, maintenance, and success. Although each specialty is highly unique in scope, every respective domain may play a critical role in the care of head and neck cancer patients. For example, key components of the protocol include perioperative anesthesia, pain management, and antibiotic use. As such, members of each group should independently review and appraise current ERAS guidelines, as well as the literature supporting a proposed guideline. Each person should ultimately be supportive of the method of implementation of ERAS guideline components. In sum, the role of these individuals is to communicate their specialty's preferences regarding patient management during regular meetings to optimize the protocol.

### Allied health representatives

As previously noted, perioperative care for patients with major head and neck cancers is highly complex. Appropriately, a host of allied health representatives can provide valuable input in patient care. Such representatives could include, but are not limited to, speech and language pathology, physical therapy, occupational therapy, social work, and dieticians/nutritionists. Speech and language pathologists are essential in assessing and managing speech, language, and swallowing. Most, if not all of these critical functions, are dramatically altered following head and neck surgery. As such, speech and language pathologists should work to establish protocols for standardized, routine assessment of postoperative swallowing and functional status in head and neck cancer patients. Dieticians and nutritionists may work to design customized feeding regimens for each patient, whether by mouth or parenteral, such as, through a feeding tube. Additionally, they may determine if there is any value in immuno-nutrition, or in ordering a standard set of labs pre- and postoperatively. Lastly, social workers can assist patients with placement following their hospital stay, and can provide resources to ensure adequate access to resources that can expedite their recovery and facilitate discharge out of the hospital in a timely manner.

## DESIGNING ERAS PROTOCOLS FOR HEAD AND NECK CANCER SURGERY

ERAS implementation in head and neck surgery has been a recent phenomenon and has yet to be widely discussed in the literature. However, several elements of ERAS protocols have been noted across a variety of specialties.[1] Such elements include preoperative patient education, perioperative nutrition, fluid management, analgesia, and antibiotic regimens. Pain management may be particularly important to consider given the current significance and impact of the opioid epidemic in our country. Additional interventions can certainly be incorporated; however, the aforementioned components should remain a mainstay in the majority of ERAS programs. Furthermore, some evidence-based ERAS guidelines have already been published in otolaryngology.[15,17–19] Specifically, recommendations set forth by Dort et al.[18] provide a robust and comprehensive overview of the major perioperative considerations that should be

contemplated by the ERAS team. Such evidence should be thoroughly reviewed by the aforementioned team members to ensure that guidelines are evidence-based and clinically utile. Published guidelines or reviews should be used as templates by way of which providers may develop protocols that are practical given their specific institutional resources, limitations, and staff size. It is possible that consensus regarding a particular recommendation is not achievable among the group. In such instances, it is preferrable that group members omit the recommendation from the ERAS protocol for the time being and revisit the issue at a later meeting if necessary. To maximize buy-in from the diverse members of the ERAS team, a plan should be developed with complete consensus of the team. Meetings should be held early and often in the development phase, with as many of the team members present as possible, and continued as guidelines are modified and updated.

## OBSTACLES TO OVERCOME

It is inevitable that certain barriers present themselves when first designing and carrying out an ERAS protocol. Buy-in from all relevant team members at each stage of patient care detailed in ERAS protocols (preoperative, inpatient, and postoperative) may help minimize such obstacles. This helps team members feel empowered to discuss inefficiencies or failures they have noticed in care delivery. Oftentimes, it may be difficult for providers to track progress in a systematic way. Addressing this may entail implementing a centralized method to monitor enrollment or lapses in the protocol; it may be worthwhile to meet with an institution's information technology (IT) manager to see if new tracking functionality can be incorporated into the medical charting system. Furthermore, following the design and initial implementation of the protocol, meetings should be held regularly with all available team members to address unforeseen roadblocks in patient care. These can occur as often as the team sees fit, but should take place with higher frequency at the beginning of protocol roll-out to mitigate initial growing pains. Finally, if financial considerations are prohibitive to ERAS implementation, it may be beneficial to meet with health system administration to present and discuss the value added by such a comprehensive intervention.

## CONTINUING EDUCATION AND QUALITY IMPROVEMENT

It is important to fully acknowledge that carrying out wide-ranging changes to care delivery can be difficult in the initial stages. Many individuals may be entrenched in particular routines and be resistant to proposed changes to long-held practice patterns.[21] Certain components of ERAS, such as preoperative education initiatives, may be relatively easy to implement. Interventions such as perioperative pain management, however, may be difficult to seamlessly incorporate into daily practice. Therefore, designing protocols with a consensus-based approach, as described previously, and prospectively tracking compliance is important for maximizing success. At the beginning, it is important for all aforementioned key leaders to send consistent reminders—perhaps every morning—so that ERAS can become part of the care team's daily language. As discussed above, empowerment of care providers and implementation of centralized methods to monitor patient enrollment serve as crucial tools for process improvement. Examples of electronic medical record functionality that can be incorporated include creating standardized reports for detailing outcomes of a given intervention, custom order sets for specific patient subsets, and an alert system that notifies providers that patients are enrolled in an ERAS procedure. Just as ERAS protocols are designed using evidence-based recommendations, it is equally important for practitioners to collect data to empirically ensure the ongoing efficacy of their specific intervention.

The bulk of the quality improvement process lies with providers that spend the greatest amount of time with patients, such as medical residents, nursing staff, and advance practice providers, among others. Any concerns should be brought up in a constructive manner that facilitates open dialogue, transitioning from a “name, blame, and shame” approach to clinical error to a “just culture” approach. A “just culture” fosters an environment of trust and encouragement and rewards people for valuable safety-related information.[22–24] This expectation and culture should be set forth early on and by all members of the team at every level of training. Overall, it takes time to break existing practice regimens and replace them with large undertakings such as ERAS. As ERAS becomes more ingrained in daily practice, reminders and regular meetings can become less frequent. However, such reinforcements and continuing education should still serve as a mainstay of the practice for the benefit of new and existing employees alike.

## CONCLUSION

Implementation of ERAS protocols in multiple surgical specialties may serve as an impactful step towards higher efficiency value-based care. This may be especially true of patients with head and neck cancers. Given the complexity of care for this population, ERAS can assist with a host of perioperative considerations to improve long-term outcomes. Careful planning, appraisal of literature, and assembly of a multidisciplinary team should be leveraged during development of ERAS guidelines. At the forefront of this undertaking, allied health professionals and frontline team members with a host of backgrounds should be involved in development and are necessary for a protocol's success. Here, we provide a comprehensive guide to ERAS planning and initiation, to aid and encourage other institutions' adoption of such procedures.

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### CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

## ETHICS STATEMENT

This work was exempted from institutional review board.

## AUTHOR CONTRIBUTIONS

**Aman Prasad:** evaluated and wrote the paper. **Kevin Chorath:** concept design, revised paper. **Louis-Xavier Barrette:** critically revising paper. **Beatrice Go:** data acquisition and revision of paper. **Jie Deng:** critically revising paper and substantial contribution to design. **Alvaro Moreira:** critically revising paper and substantial contribution to design. **Karthik Rajasekaran:** concept and design, analysis and interpretation of data, critically revised and final approval.

## DATA AVAILABILITY STATEMENT

Data without patient recognizable identification can be acquired by contacting the corresponding author.

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