

Clinical Position Paper: Proactive Airway Stabilization During Procedural Sedation and Select TIVA Anesthesia Cases

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This position paper outlines the clinical rationale for proactive airway stabilization using the xchange™ system during procedural sedation and select total intravenous anesthesia (TIVA) cases where maintenance of spontaneous ventilation is desired.

Executive Thesis

Current airway management practices during procedural sedation and many TIVA cases that do not utilize a supraglottic airway often make it challenging to maintain consistent upper airway patency and effective ventilation. The Xchange system addresses this by delivering titratable nasal CPAP, designed to support ventilation, maintain upper airway patency, and reduce the need for rescue airway interventions.

Clinical Problem

Sedation and TIVA commonly reduce upper airway muscle tone, increasing the risk of partial or complete airway collapse. This is particularly problematic in patients with obesity, OSA, difficult airway anatomy, and procedures requiring deeper levels of anesthesia while preserving spontaneous respiration.

Limitations of Current Practice

Traditional oxygen delivery devices increase inspired oxygen concentration but do not address airway collapse. As a result, clinicians often progress through an escalation pathway including jaw thrust, oral airways, nasopharyngeal airways, supraglottic airways (LMAs), and in the rare instance, endotracheal intubation.

Mechanism of Action

xchange™ nasal CPAP delivers continuous, titratable positive airway pressure using standard oxygen infrastructure. Clinically meaningful airway pressure helps stent open

collapsible upper airway structures, maintain airway patency, improve ventilation, and reduce the frequency of airway rescue maneuvers.

Role in Procedural Sedation

The primary application of xchange™ is proactive airway stabilization during moderate and deep sedation. By maintaining airway patency before clinically significant obstruction develops, clinicians may reduce hypoxemic events, procedural interruptions, and the need for escalating airway interventions.

Role in Select TIVA Cases

In addition to procedural sedation, xchange™ may provide significant value in select TIVA cases where patients are maintained under general anesthesia while continuing to breathe spontaneously. In these scenarios, anesthesiologists frequently utilize supraglottic airways such as LMAs to maintain airway patency. By delivering non-invasive positive airway pressure and supporting upper airway patency, xchange™ may offer an alternative airway management strategy in appropriately selected patients. The goal is not to replace the use of supraglottic airways, but rather to potentially reduce reliance on mechanical airway devices in select spontaneously breathing anesthetized patients. A representative example would be a stable patient requiring anesthesia for wrist fracture repair who does not receive a peripheral nerve block and has a history of reactive airway disease. In this setting, a TIVA technique without a supraglottic airway may be preferred to avoid airway instrumentation,

Airway Escalation Paradigm

Positioned between basic oxygen delivery and invasive airway management, xchange™ fills a critical gap in the escalation pathway. It empowers clinicians to intervene earlier during procedural sedation and select TIVA cases, supporting upper airway patency and ventilation while reducing progression to oral airways, LMAs, and other rescue interventions.

Clinical Endpoints

Primary endpoints include maintenance of SpO₂, ETCO₂ trends, airway patency, delivered airway pressure up to 20 cmH₂O, and reduction in hypoxemic events. Secondary endpoints evaluate reduced airway interventions, improved procedural continuity, greater workflow efficiency, and enhanced overall patient safety.

Target Patient Populations

The xchange™ system may be particularly beneficial for patients with high BMI, obstructive sleep apnea (OSA), difficult airways, as well as those undergoing GI procedures, bronchoscopy, electrophysiology studies, interventional radiology, orthopedic MAC/TIVA cases, or additionally any other procedure where upper airway obstruction is anticipated.

Operational and Economic Impact

The xchange™ integrates effortlessly into current anesthesia workflows without any capital equipment investment. By enabling earlier airway support, it may reduce procedural interruptions, decrease escalations to invasive rescue devices, and optimize workflow efficiency. Significant cost savings may be achieved through improved resource utilization, reduced OR time, and avoided expenses associated with airway complications and additional interventions.

Future Platform Opportunity

The physiologic principles underlying xchange™ may have broader application across perioperative medicine, respiratory support, and critical care. Future development may further expand the platform's role in airway management and respiratory monitoring and offer benefits to additional patient populations.

Conclusion

For patients under procedural sedation and select TIVA cases that do not necessitate a supraglottic airway, the xchange™ empowers clinicians with an innovative solution that fills a critical gap in current practice and represents a significant advancement in airway management. By delivering titratable nasal CPAP, it proactively maintains upper airway patency, supports reliable oxygenation and ventilation, and enables earlier intervention in the airway deterioration pathway which may substantially enhance patient safety by reducing the risk of hypoxemic events and minimizing the need for invasive rescue devices.