



A novel multi-functional introducer - Safe Easy Endotracheal kit-flexible

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Difficult airways are a common concern for physicians in the department of anesthesiology, emergency medicine, and critical care medicine. SEEK^{flex} (Safe Easy Endotracheal kit-flexible) is a novel multifunctional introducer developed by our team to address difficult airways. It has been registered as a medical device in China (Zhejiang Medical Device Registration Approval No. 20232081322).

The SEEK^{flex} system features a dual-component design, consisting of a primary introducer and a supplementary adapter. With an outer diameter of 4.0 mm and an inner diameter of 2.4 mm, it is compatible with tracheal tubes of an internal diameter exceeding 4.5 mm. The introducer,

extending from 43 to 81 cm, is equipped with a flexible steel core for guidance and a smooth polyvinyl chloride (PVC) sheath. This assembly can be securely fastened using a blue locking mechanism, as depicted in **Figure 1A-B** [1].

SEEK^{flex} can be bent at an appropriate angle due to the malleability of its inner core, allowing it to be easily inserted into the trachea just under the epiglottis in cases of unpredicted difficult airway (Cormack-Lehane Grade III). This procedure is facilitated by a video laryngoscope. The endotracheal position of SEEK^{flex} is confirmed by connecting it to an EtCO₂ monitor via the adapter after removing the inner core (**Figure 1C**). The endotracheal tube can be eas-

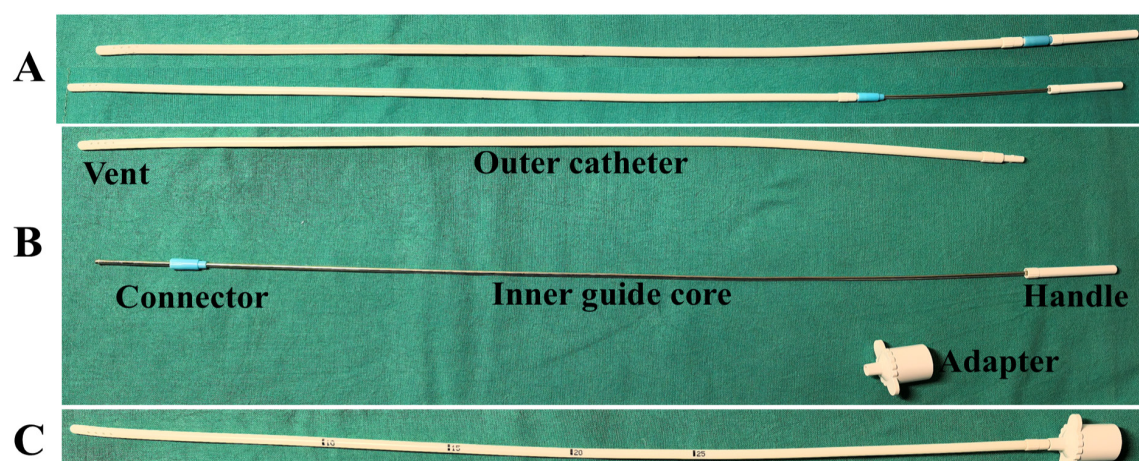


Figure 1. Components of SEEK^{flex}. (A) SEEK^{flex} that is not connected to the adapter; (B) Components of SEEK^{flex}; (C) SEEK^{flex}. SEEK^{flex}, safe easy endotracheal kit-flexible.



ily advanced into the trachea using the Seldinger technique, with the guidance of reconnected, post-stretching SEEK^{flex}. In addition, we have developed a “12-step” approach for awake tracheal intubation using SEEK^{flex} and a video laryngoscope, which has yielded satisfactory clinical results [2].

At the distal end of the outer catheter, there is one vent at the top and 4 rows of lateral vents. After removing the inner core and attaching the adapter, local anesthetic can be administered, and oxygenation can be maintained using a ventilator, like a slender tracheal tube. The original version of this introducer was used for reintubation of COVID-19 patients, and the outer catheter could be left in place for subglottic oxygenation after extubation [3]. This feature is also used for oxygenation maintenance and tracheal intubation in emergency situations during bronchoscopic balloon dilation [4].

Several randomized controlled studies, approved by the Ethics Committee of the Naval Medical University and currently in the process of data collection, may further provide robust evidence of its safety and efficacy. We believe that this new multifunctional introducer can be widely adopted by anesthesiologists due to its versatility across multiple clinical scenarios.

Author Contributions:

Zui Zou conceived the original idea and supervised the project. Chenglong Zhu wrote the manuscript. Jianhua Xia helped shape the manuscript. All authors contributed to the article.

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