

# **The Efficacy of Postoperative Application of High Flow Nasal Cannula at Acute Phase for Minimally Invasive Esophagectomy Surgery Patients**

## ***Study Protocol***

This prospective, single-blinded, pre- and post-intervention study was conducted at a tertiary medical center in Taipei, Taiwan, from February 2019 to November 2020.

During this time, consecutive patients ( $\geq 20$  years) admitted to the surgical ICU after esophagectomy with reconstruction were included. Patients were excluded if they

- (1) were not extubated before ICU admission
- (2) received tracheostomy
- (3) had  $>1,000$  mL blood loss or intraoperative cardiopulmonary resuscitation
- (4) required high-dose inotropic agents or vasopressors (inotropic equivalent  $> 15$ )
- (5) could not respond to questions/interventions.

All patients or their legal representatives provided written informed consent.

Participants recruited before 2020 received standard oxygen (SO) therapy plus usual care and served as the control group (SO group). Participants recruited from January 2020 received the HFNC intervention plus usual care and served as the intervention group (HFNC group). Prior to study commencement, an experienced group of respiratory therapists ensured that all ICU nurses and medical staff received adequate training on the use of HFNC. As no prior studies on this topic were available, we

were unable to estimate the intervention effect to determine the study size.

Nonetheless, we included 34 participants in the intervention group. The study was approved by the Human Research Ethics Committee of the study hospital (201807098RINC).

***Trial registration:*** NCT03816748, registered on January 25, 2019.