placed patients with preoperative Pao₂ as low as 55 mm Hg, simple oxygen addition by a Venturi mask assured an optimal oxygenation throughout the procedure. This is possibly facilitated by the maintained diaphragmatic motion as well as by suprapontine compensatory mechanisms.

Increasing pathophysiologic knowledge and clinical evidence suggest that general anesthesia is not always necessary in thoracic surgery, and in some patient populations awake anesthesia can offer a less morbid, parapsycho-logic model of management. We congratulate Noda and coworkers¹ for their interesting series with excellent results and cautious conclusions.

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Reply to the Editor:

We appreciate the useful comments expressed by Dr Pompeo on behalf of the Awake Thoracic Surgery Research Group regarding our recently published original article entitled, "Is There a Benefit of Awake Thoracoscopic Surgery in Patients With Secondary Spontaneous Pneumothorax?"¹ We are grateful for the opportunity to respond to these comments.

We agree that severe air trapping attenuates the effect of atmospheric

intrapleural pressure on ventilation as a result of prolonged exhalation times and the existence of positive end-expiratory pressures in peripheral alveolar regions that may counteract the detrimental effects of pendular ventilation during the awake procedure.

Moreover, we have reported a case of intractable right pneumothorax after left pneumonectomy that was successfully treated with awake video-assisted thoracoscopic surgery under conditions of local and epidural anesthesia.² In this case, the patient maintained spontaneous single-lung breathing throughout the operation with supplied oxygen to maintain functional oxygen saturation greater than 94% because of the prolonged exhalation times and existence of positive end-expiratory pressures in 1 lung.

Although there are a few exceptions, if the lung collapse is extremely progressed under atmospheric pressure conditions and desaturation is recorded during the awake procedure, the lung should be temporarily re-expanded by sucking the air in the pleural cavity through the chest drainage tube.

The vital issue in awake thoracic procedure is the surgical position. Our awake thoracic procedure for intractable pneumothorax is generally conducted in the lateral surgical position, with most of the bubbling alveolar air leakage managed by sucking the air through the chest drainage tube because the air leakage sites can be immediately identified during the awake procedure. If the patients have shoulder or lumbar pain on the contralateral side during awake procedure in the lateral position, the position may be gradually altered to a semilateral or supine position.

Moreover, in patients undergoing awake thoracic procedures for pneumothorax, the surgical technique for controlling air leakage is vital for preventing a recurrence. In all our patients with pneumothorax, the area of ligation or the staple line was reinforced with

nonwoven polyglycolic acid sheets (NEOVEIL; Gunze Co, Ayabe, Japan) or regenerated oxidized cellulose mesh (Surgicel; Ethicon, Inc, Somerville, NJ) and fibrin glue (Bolheal; Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan).³ This mechanism facilitates thickening of the visceral pleural surface.⁴

We thank Dr Pompeo and his group for their informative and encouraging comments on the awake surgical management of secondary pneumothorax.

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AN IMPORTANT STEP TOWARD AMBULATORY VENO-VENOUS EXTRACORPOREAL MEMBRANE OXYGENATION To the Editor:

We read with great interest the recently published work entitled, "Ambulatory Veno-Venous Extracorporeal Oxygenation: Innovations and Pitfalls," from the Maryland extracorporeal membrane oxygenation group.¹

First, we congratulate Garcia and colleagues¹ on their clear article,