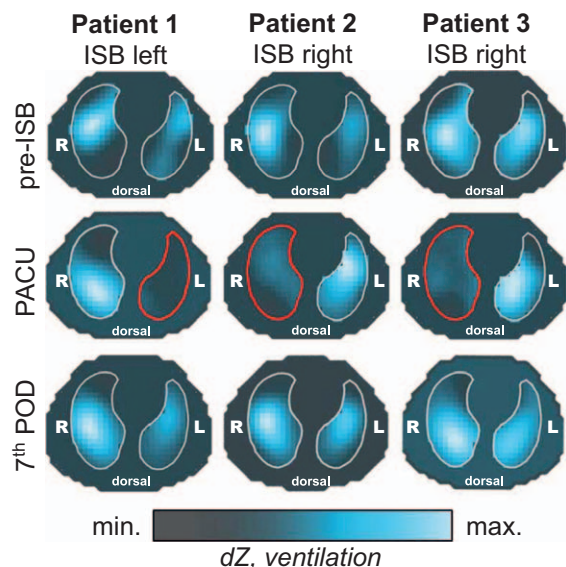


# Electrical Impedance Tomography Visualizes Impaired Ventilation Due to Hemidiaphragmatic Paresis after Interscalene Brachial Plexus Block

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**E**LECTRICAL impedance tomography (EIT) uses electrode belts to apply minimal electrical currents on the thorax from which images of pulmonary ventilation are derived. Ventilation and impedance changes ( $dZ$ ) are directly correlated.<sup>1</sup> The color of each pixel of an EIT image (fig.) represents the amount of local ventilation, where whitish colors relate to high ventilation and dark ones to little ventilation.

With the patients' consent, data were acquired before interscalene brachial plexus block (pre-ISB), in the postanesthesia care unit (PACU), and during a visit on seventh postoperative day (POD) using the EIT device *Swisstom BB<sup>2</sup>* (Swisstom, Landquart, Switzerland). Three men (American Society of Anesthesiologists Physical Status Classification II-III; body mass index, 26.6–32.9 kg/m<sup>2</sup>; age, 47–62 yr) received sonography-guided single-shot ISB (20 ml ropivacaine 0.75%) before general anesthesia for shoulder arthroscopy.

Electrical impedance tomography images either showed the presence or the absence of ventilation within the contours depicting the right and left lungs. All patients showed bilateral ventilation before ISB, significantly reduced ventilation on the side of the ISB (high-

lighted by red boundary; L = left; R = right) in the PACU, and restored bilateral ventilation on seventh postoperative day.

Electrical impedance tomography imaging could diagnose the hypoventilation caused by the ISB-induced hemidiaphragmatic paresis. Such compromise may persist beyond discharge.<sup>2,3</sup> While sonography merely demonstrates impaired diaphragmatic excursions, EIT actually visualizes regional ventilation.<sup>1–3</sup> Contrary to spirometry previously used to quantify the overall ventilation impairment, real-time EIT monitoring could easily be used during routine anesthesia care. The demonstration of both, preexisting or ISB-induced hemidiaphragmatic paresis, may influence decision-making regarding the eligibility of patients for ISB or their discharge from the PACU.

## Acknowledgments

EIT device was provided by Swisstom, Switzerland.

## Research Support

Support was provided solely from institutional and/or departmental sources.

## Competing Interests

Mr. Hammermüller works part time for Swisstom, Landquart, Switzerland. The other authors declare no competing interests.

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