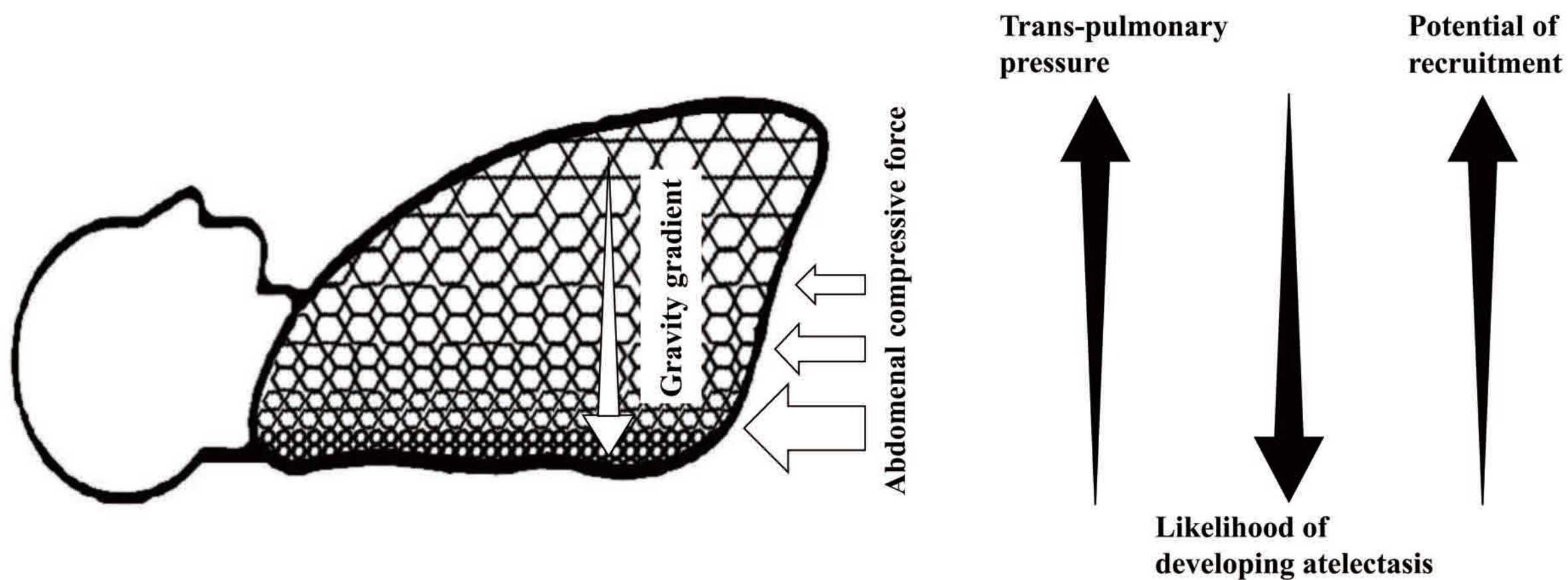


a



b

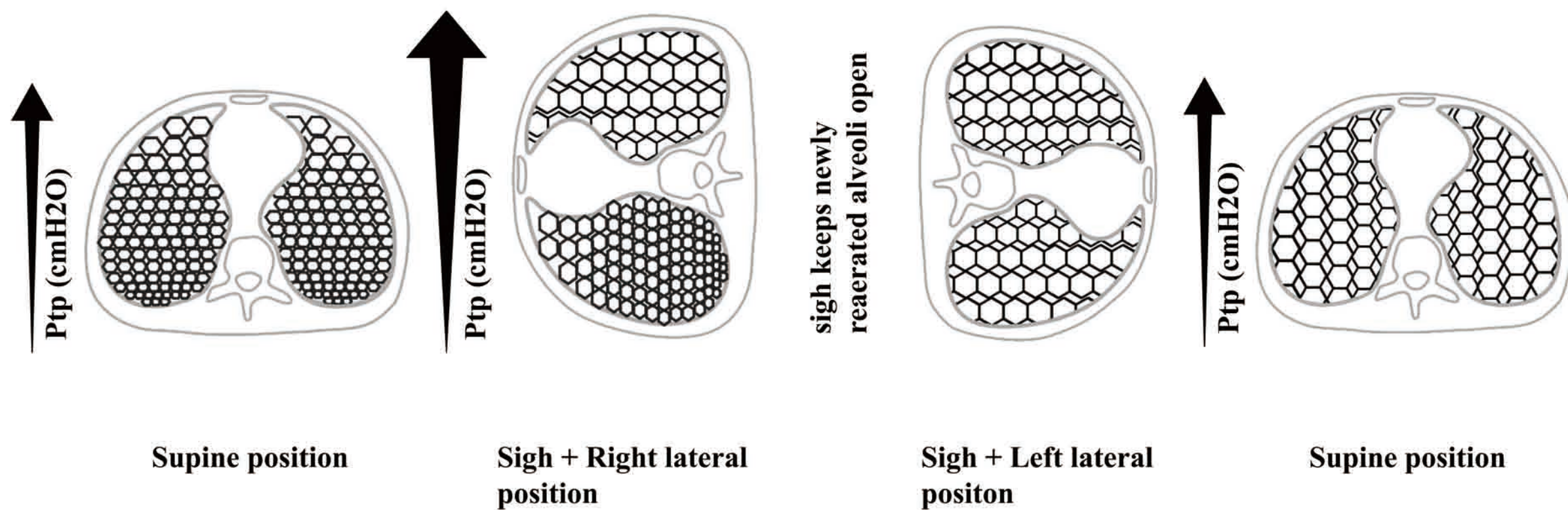


Fig S2. (a) Postoperative atelectasis is a position and pressure-dependent phenomenon.

In anesthetized patients with supine position, the negative pleural pressure increases gradually along the gravity vector because of the lungs' own weight and the compression of abdominal organs, while the positive airway pressure delivered by the ventilator is distributed homogeneously within the lungs. Therefore, the trans-pulmonary pressure (airway pressure minus pleural pressure) and the tendency of lung collapse decrease gradually from the dorsal dependent zones to the ventral non-dependent areas. The opposite is also true when it comes to opening pressure and potential of lung recruitment.

(b) Schematic diagram of sigh in lateral position. The maneuver consists of periodic sigh breaths and sequential changes in position from the supine position to the lateral position and then back to the supine position again. Due to the oval shape of the chest, the gradient of trans-pulmonary pressures is much greater in the lateral position than in the supine position. Thus, the upper half of the lungs is re-aerated easily in the lateral position. Once re-aerated, the upper half can maintain its “open lung” condition even when the patient is turned to the opposite side provided sighs are applied. Finally, both lungs remain “open” although the patient has returned to the previous supine position.

Ptp, trans-pulmonary pressure.