average cerebral saturation using a logistic nominal regression.

Twenty-nine consecutive patients (16 women and 13 men) aged 62 ± 10 yr underwent lobectomy, chest wall resection, and lung decortication with a mean length of surgery of 141 ± 86 min and 94 ± 56 min of one-lung ventilation (OLV). In total, 941 data points were collected, each point corresponding to an upper and a lower hemisphere value. Forty-three values were excluded where no or unstable signal was detected in one of the two hemispheres, and 898 data points were included in the final analysis. The observations were distributed as follows: 22% of data were before, 59% during, and 9% after OLV.

SctO₂ of the upper hemisphere was significantly higher in 56% of patients, equal in 18% and lower than the lower hemisphere in 26% (P < 0.0001 vs symmetrical distribution) (Fig. 1). On average, SctO₂ in the upper hemisphere was 1.3% higher than the lower hemisphere (95% CI of the mean 1.06–1.49, P < 0.0001). The inter-hemispheric SctO₂ –difference increased by 0.038 ± 0.017% for each 1% increase in SctO₂ (P < 0.03).

In lateral position, the upper hemisphere shows significantly higher SctO₂ values; the difference in the values of the lower hemisphere increases further with increasing SctO₂ values. Although this significant difference might not have a clinical impact in the majority of the patients and settings, it is interesting to note that there are differences in the lateral position, which are possibly because of changes in venous pressure or deoxygenation. Further studies might be needed to find out what happens in these situations.

T. M. Hemmerling*
R. Kazan
D. Bracco
Montreal, Canada
*E-mail: thomashemmerling@hotmail.com

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Does low-volume inter-scalene block attenuate the severity of diaphragmatic paresis?

Editor—I commend Riazi and colleagues 1 on their important study demonstrating that the analgesic effect of an inter-scalene brachial plexus block (ISBPB) may be achieved with an extremely low volume (5 ml) of local anaesthetic, while simultaneously reducing the incidence of phrenic nerve palsy (from 100% to 45%). There were also significantly smaller reductions in mean spirometry values in the low-volume group. It is not clear however, if the low-volume technique achieved this by attenuating the severity of diaphragmatic paresis in patients who did develop phrenic nerve palsy (nine of 20), or whether this result was primarily because of normal or near-normal spirometry values in those patients who did not develop a palsy. It would be helpful if the authors reported the spirometric data separately in these two subgroups of patients who received the low-volume block. Without this information, the authors’ conclusion that a low-volume technique ‘may allow patients at higher risk of postoperative respiratory complications to undergo ISBPB’ may not be justified.

K. J. Chin
Toronto, Canada
E-mail: gasgenie@gmail.com

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Table 1 Respiratory characteristics of Groups I and II with further breakdown of Group I data into those patients who did (Ib) and did not (Ia) develop phrenic palsy. FVC, forced vital capacity; FEV₁, forced expiratory volume in 1 s; PEF, peak expiratory flow rate. *30 min after surgery on air compared with baseline

<table>
<thead>
<tr>
<th></th>
<th>Group I: 5 ml volume, mean (sd)</th>
<th>Group Ia: 5 ml volume (no palsy), mean (sd)</th>
<th>Group Ib: 5 ml volume (phrenic palsy), mean (sd)</th>
<th>Group II: 20 ml volume, mean (sd)</th>
<th>Significance (group Ib vs II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>20/20</td>
<td>11/20</td>
<td>9/20</td>
<td>20/20</td>
<td></td>
</tr>
<tr>
<td>Change in FVC at 30 min postblock (litre)</td>
<td>−0.7 (0.7)</td>
<td>−0.58 (0.74)</td>
<td>−0.84 (0.68)</td>
<td>−1.59 (0.68)</td>
<td>0.01</td>
</tr>
<tr>
<td>Change in FEV₁ at 30 min postblock (litre)</td>
<td>−0.6 (0.54)</td>
<td>−0.57 (0.58)</td>
<td>−0.62 (0.53)</td>
<td>−1.23 (0.61)</td>
<td>0.02</td>
</tr>
<tr>
<td>Change in PEF at 30 min post block (litre min⁻¹)</td>
<td>−0.83 (1.01)</td>
<td>−0.85 (1.24)</td>
<td>−0.79 (0.7)</td>
<td>−2.50 (1.61)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Change in oxygen saturation (%)*</td>
<td>−1.5 (3.13)</td>
<td>−0.9 (1.75)</td>
<td>−2.2 (4.3)</td>
<td>−5.85 (3.78)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Adverse outcomes</td>
<td>0/20</td>
<td>0/11</td>
<td>0/9</td>
<td>8/20 (Horner’s syndrome: 3, hoarseness: 3, severe respiratory distress: 1, hiccups: 1)</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

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Editor—Dr Chin makes a valid point and we thank him for his letter in response to our study.1 The author comments that our conclusions may not be justified because even the low volume (5 ml) group had a 45% risk of phrenic palsy. Our results would then be meaningless if the magnitude of decrease in spirometry values were the same in all patients who developed phrenic palsy. Table 1 displays the characteristics of group I (all low volume), group Ia (low volume, no palsy), group Ib (low volume, palsy), and group II (high volume, all of whom developed phrenic palsy). Differences between group Ib (low volume, palsy) and group II (high volume) have been compared using \( t \)-tests. Significance is assumed at \( P < 0.05 \).

Reassuringly it appears that even patients who get phrenic nerve palsy in the low-volume group have significantly better preservation of lung function than the high-volume group (Fig. 1). This adds further weight to our conclusion that low volume (5 ml) ultrasound-guided interscalene block provides equivalent analgesia, but causes significantly less respiratory compromise compared with high-volume (20 ml) block.

C. J. L. McCartney*
N. M. Carmichael
S. Riazi
I. T. Awad
Toronto, Canada
*E-mail: Colin.mccartney@utoronto.ca


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Transversus abdominis plane block for laparoscopic surgery

Editor—Transversus abdominis plane (TAP) block is gaining popularity as a method for pain relief after abdominal surgery.1,2 As with any novel approach, the indications for this block are expanding. We report the successful use of TAP blocks for laparoscopic surgery in five patients. Four of the patients were aged between 14 and 17 yr and underwent laparoscopic appendicectomy. The fifth patient was 79 yr old and had a laparoscopic incisional hernia repair.

Cases 1–4 had laparoscopic appendicectomy under general anaesthesia. Bilateral TAP blocks were performed under ultrasound guidance using a high-frequency 5–13 MHz linear array probe (Sonosite Micromaxx®). The different layers of the abdominal wall were identified from above downwards: skin, s.c. tissue and fat, external oblique muscle, internal oblique muscle, transversus abdominis muscle, and peritoneum (Fig. 1). An 80 mm needle (Pajunk, Germany) was inserted in plane with the ultrasound beam until it reached the plane between the internal oblique and the transversus abdominis muscle where 20 ml of 0.25% \(\text{L}-\text{bupivacaine} \) were injected (Fig. 1). This procedure was repeated on the opposite side of the midline. The surgical time was a mean of 45 min during which time no further analgesia was administered. All patients were prescribed regular acetaminophen and diclofenac for postoperative pain relief. Pain scores were recorded hourly for the first 12 h using a visual analogue scale (scores 0–10: 0, no pain; 10, maximum pain). None of the patients required rescue opiates in the first 12 h after operation, the pain scores ranging between 0 and 2. Two of the patients were so comfortable that they did not

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**Fig 1** Correct needle placement in the plane between internal oblique and transversus abdominis.