

# What is the prescient worth of intraoperative somatosensory evoked likely observing for postoperative neurological shortfall in cervical spine medical procedure? a meta-investigation

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## **Introduction:**

Cervical decompression and fusion surgery remains a mainstay of treatment for a variety of cervical pathologies. Potential intraoperative injury to the spinal cord and nerve roots poses nontrivial risk for consequent postoperative neurologic deficits. Although neuromonitoring with intraoperative somatosensory evoked potentials (SSEPs) is often used in cervical spine surgery, its therapeutic value remains controversial. Inclusion criteria for study selection were as follows: (1) prospective or retrospective cohort studies, (2) studies conducted in patients undergoing elective cervical spine surgery not due to aneurysm, tumor, or trauma with intraoperative SSEP monitoring, (3) studies that reported postoperative neurologic outcomes, (4) studies conducted with a sample size  $\geq 20$  patients, (5) studies with only adult patients  $\geq 18$  years of age, (6) studies published in English, (7) studies inclusive of an abstract. “

indicate a much higher risk of injury than reversible SSEP changes.

**Objectives:** The purpose of the present study was to evaluate whether significant SSEP changes can predict postoperative neurologic complications in cervical spine surgery. A subgroup analysis was performed to compare the predictive power of SSEP changes in both anterior and posterior approaches.

**Results:** The total rate of postoperative neurological deficits was 2.50% (194/7,747) and the total rate of SSEP changes was 7.36% (570/7,747). The incidence of postoperative neurological deficit in patients with intraoperative SSEP changes was 16.49% (94/570) while only 1.39% (100/7,177) in patients without. All significant intraoperative SSEP changes had a sensitivity of 46.0% and specificity of 96.7% with a DOR of 27.32. Reversible and irreversible SSEP changes had sensitivities of 17.7% and 37.1% and specificities of 97.5% and 99.5%, respectively. The DORs for reversible and irreversible SSEP changes were 9.01 and 167.90, respectively. SSEP loss had a DOR of 51.39, sensitivity of 17.3% and specificity 99.6%. In anterior procedures, SSEP changes had a DOR of 9.60, sensitivity of 34.2%, and specificity of 94.7%. In posterior procedures, SSEP changes had a DOR of 13.27, sensitivity of 42.6%, and specificity of 94.0%.

**Conclusions:** SSEP monitoring is highly specific but weakly sensitive for postoperative neurological deficit following cervical spine surgery. The analysis found that patients with new postoperative neurological deficits were nearly 27 times more likely to have had significant intraoperative SSEP change. Loss of SSEP signals and irreversible SSEP changes seem to