After a systematic review, we provide **recommendations** for the non-invasive recording of Somatosensory Evoked Potentials (SEPs) from the spinal cord.

Recordings of SEPs from spinal regions: a systematic review

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Background and Aim

The **non-invasive recording of the electrical activity of the spinal cord** is limited by physiological and technical challenges. Still, in recent years several articles claiming to record spinal cord activity using surface electrodes in response to transcutaneous stimulation of peripheral nerves have been published.

However, the solidity of the reported results is questionable due to the lack of consistency in experimental design, recording technique, and analysis approach. To critically assess these results we conducted a systematic review of the available literature.

Method

We performed a **systematic review** following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement. We investigated 14 different metrics of 51 published spinal SEP recordings, such as stimulation paradigm, electrode type, electrode position, signal reference, and filtering (for details see QR code).

Results

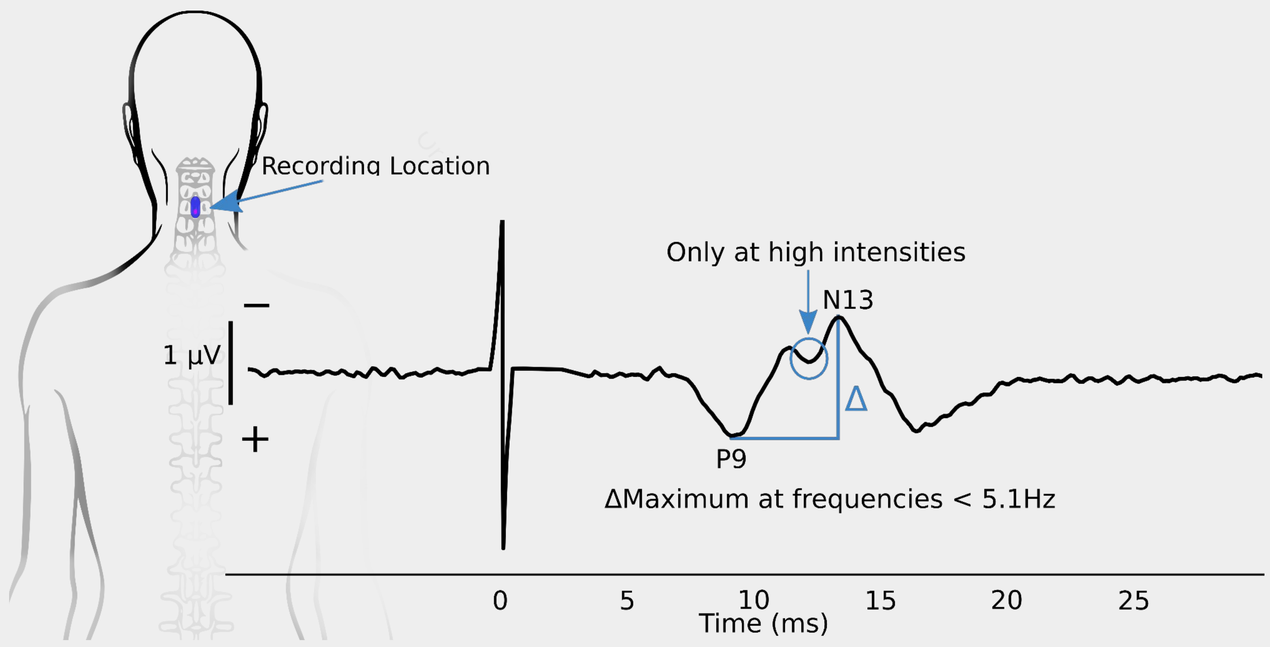
On the basis of the evaluated metrics we provide normative values and recommendations to obtain reliable spinal SEP recordings. Briefly, we recommend the following:

With respect to **stimulation parameters**:

- Stimulate at frequencies lower than 5.1 Hz, avoiding factors of the power line frequency
- Use stimulation intensity higher than 12 mA

With respect to **recording parameters**:

- Avoid the use of-cephalic references
- Use bipolar recordings with interelectrode distance not longer than a few centimeters
- Simultaneous recording of the ECG, to remove heartbeat-related artifacts



Spinal SEPs elicited from median nerve stimulation

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