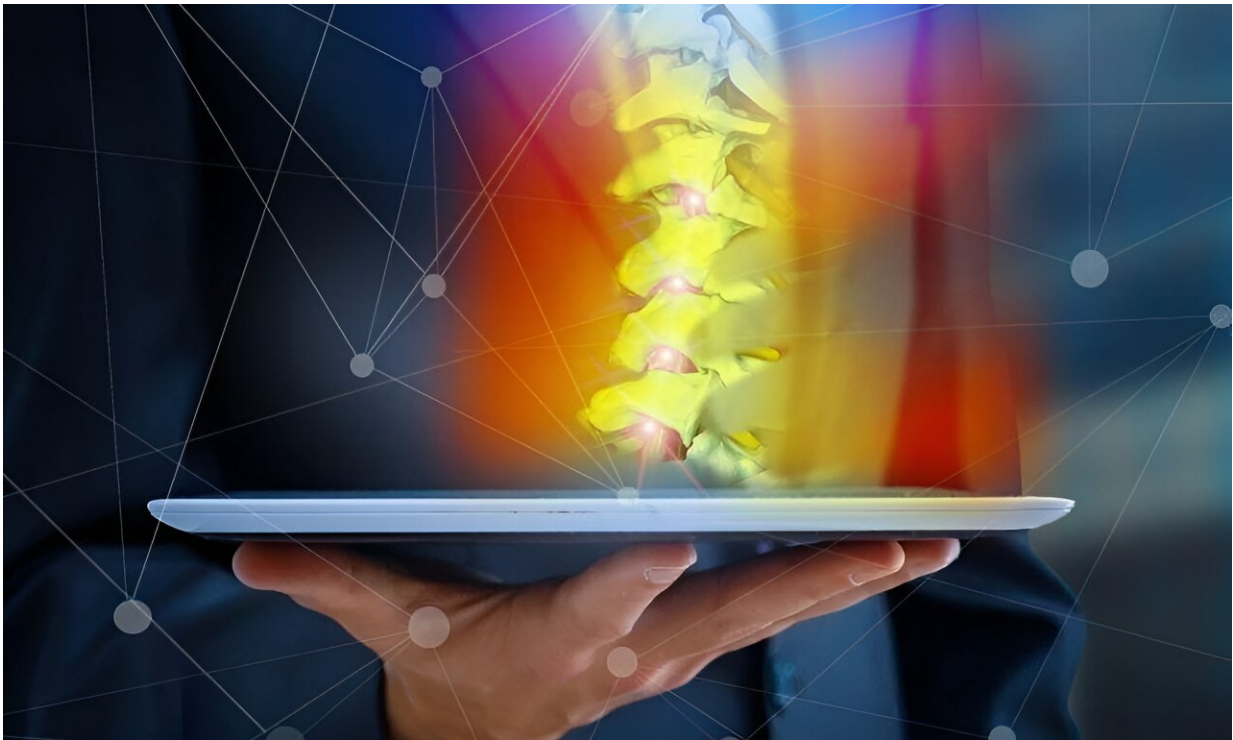


Study shows how AI can predict prognosis after lumbar disk herniation surgery

February 12 2024, by Elana Gotkine



Machine learning models can inform patients and clinicians about prognosis after lumbar disk herniation surgery, according to a [study](#) published online Feb. 7 in *JAMA Network Open*.

Bjørnar Berg, Ph.D., from Oslo Metropolitan University in Norway, and

colleagues developed and validated [prediction models](#) for disability and pain 12 months after lumbar disk herniation surgery in a prospective registry-based prognostic study. The analysis included 22,707 surgical cases (21,161 patients) in the Norwegian Registry for Spine Surgery.

The researchers found that the proportion of cases experiencing treatment non-success were 33, 27, and 31 percent based on improvement in the Oswestry Disability Index (ODI), Numeric Rating Scale (NRS) back pain, and NRS leg pain, respectively.

Across all five [geographic regions](#), the selected machine learning models showed consistent discrimination and [calibration](#) in internal-external cross-validation. For the ODI model, the C-statistic ranged from 0.81 to 0.84.

Across regions, calibration slopes (point estimates, 0.94 to 1.03) and calibration intercepts (point estimates, -0.05 to 0.11) were also consistent. The C-statistic ranged from 0.75 to 0.80 for NRS back pain and from 0.74 to 0.77 for NRS leg pain.

"The models were based on routinely available preoperative predictors, making them readily amenable to further external validation in other spine registries and potentially implementable in electronic medical records systems to inform about individual prognosis and aid in surgical decision-making," the authors write.

More information: Bjørnar Berg et al, Machine Learning Models for Predicting Disability and Pain Following Lumbar Disc Herniation Surgery, *JAMA Network Open* (2024). [DOI: 10.1001/jamanetworkopen.2023.55024](#)

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