Lumbar spine surgery prognosis

- Prognostic value of combining preoperative immune-inflammatory-nutritional index and tumor biomarkers in gastric cancer patients undergoing radical resection
- Percutaneous transforaminal endoscopic discectomy in patients with lumbar disc herniation: a meta-analysis
- Does the number of drain tubes influence the formation of postoperative spinal epidural hematoma following biportal endoscopic unilateral laminotomy for bilateral decompression (BE-ULBD) in patients with two-level adjacent lumbar spinal stenosis? a prospective randomized study
- Early effectiveness of posterior 180-degree decompression via unilateral biportal endoscopy in treatment of lumbar spinal stenosis combined with MSU-1 lumbar disc herniation
- Robot-assisted versus navigated spinal fusion surgery: a comparative multicenter study on transpedicular screw placement accuracy and patient outcomes
- Adolescent lumbar disc herniation: etiology, diagnosis, and treatment options
- Influence of pelvic incidence-lumbar lordosis mismatch on surgical outcomes of total hip arthroplasty: a retrospective cohort study
- Effect of metabolic syndrome on patient-reported outcome measures following lumbar fusion surgery: a longitudinal study with 24-month follow-up

Factors

The prognosis for **lumbar spine surgery** depends on multiple factors, including the **specific procedure performed, the underlying condition, patient health, and adherence to rehabilitation protocols**.

Common Lumbar Spine Surgeries and Their Prognosis

Lumbar discectomy prognosis

Lumbar laminectomy prognosis

Lumbar Spinal Fusion prognosis

Lumbar Total Disc Replacement prognosis

2. Factors Affecting Prognosis - **Patient Age:** Older patients may have a slower recovery and higher risk of complications. - **Comorbidities:** Diabetes, osteoporosis, smoking, and obesity can impair healing. - **Preoperative Symptoms:** Chronic pain (>1 year) has a worse prognosis than acute symptoms. - **Surgical Technique:** Minimally invasive surgery generally leads to faster recovery. - **Rehabilitation & Compliance:** Physical therapy and lifestyle changes improve long-term outcomes.

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3. Risks and Potential Complications - **Infection (1-4%)** - **Dural tear (1-10%)** – Can cause cerebrospinal fluid (CSF) leak. - **Nerve injury (<1%)** – May result in persistent neuropathic pain. - **Reoperation risk:** ~10-20% for degenerative conditions. - **Adjacent segment disease (after**

fusion) – May require further surgery.

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4. Long-Term Outlook - **Most patients experience significant pain relief and functional improvement.** - **Rehabilitation is crucial** to prevent complications and improve mobility. - **Ongoing physical activity and weight management** help maintain spinal health.

In modern clinical research, the accepted minimum follow-up for patient-reported outcome measures (PROMs) after lumbar spine surgery is 24 months, particularly after fusion. Recently, this minimum requirement has been called into question.

Staartjes et al. aimed to quantify the concordance of 1- and 2-year PROMs to evaluate the importance of long-term follow-up after elective lumbar spine surgery.

They identified all patients in a prospective institutional registry who underwent degenerative lumbar spine surgery with complete baseline, 12-month, and 24-month follow-up for ODI and NRS back and leg pain.

Oswestry Disability Index (ODI) and numeric rating scales for back and leg pain at 1 year and at 2 years.

They evaluated concordance of 1- and 2-year change scores by means of Pearson's product-moment correlation and performed logistic regression to assess if achieving the minimum clinically important difference (MCID) at 12 months predicted 24-month MCID. Odds ratios (OR) and their 95% confidence intervals (CI), as well as model areas-under-the-curve (AUC) were obtained.

A total of 210 patients were included. We observed excellent correlation among 12- and 24-month ODI ($r = 0.88$), NRS-LP ($r = 0.76$) and NRS-BP ($r = 0.72$, all $p < 0.001$). Equal results were obtained when stratifying for discectomy, decompression, or fusion. Patients achieving 12-month MCID were likely to achieve 24-month MCID for ODI (OR: 3.3, 95% CI: 2.4 to 4.1), NRS-LP (OR: 2.99, 95% CI: 2.2 to 4.2) and NRS-BP (OR: 3.4, 95% CI: 2.7 to 4.2, all $p < 0.001$) with excellent AUC values of 0.81, 0.77, and 0.84, respectively. Concordance rates between MCID at both follow-ups were 87.2%, 83.8%, and 84.2%. A post-hoc power analysis demonstrated sufficient statistical power.

Irrespective of the surgical procedure, 12-month PROMs for functional disability and pain severity accurately reflect those at 24 months. In support of previous literature, our results suggest that 12 months of follow-up may be sufficient for evaluating spinal patient care in clinical practice as well as in research.

With the recent passage of the Patient Protection and Affordable Care Act, there has been a dramatic shift toward critical analyses of quality and longitudinal assessment of subjective and objective outcomes after lumbar spine surgery. Accordingly, the emergence and routine use of real-world institutional registries have been vital to the longitudinal assessment of quality. However, prospectively obtaining longitudinal outcomes for patients at 24 months after spine surgery remains a challenge [1].

The aim of a study was to assess if 12-month measures of treatment effectiveness accurately predict

long-term outcomes (24 months).

A nationwide, multiinstitutional, prospective spine outcomes registry was used for this study. Enrollment criteria included available demographic, surgical, and clinical outcomes data. All patients had prospectively collected outcomes measures and a minimum 2-year follow-up. Patient-reported outcomes instruments (Oswestry Disability Index [ODI], SF-36, and visual analog scale [VAS]-back pain/leg pain) were completed before surgery and then at 3, 6, 12, and 24 months after surgery. The Health Transition Index of the SF-36 was used to determine the 1- and 2-year minimum clinically important difference (MCID), and logistic regression modeling was performed to determine if achieving MCID at 1 year adequately predicted improvement and achievement of MCID at 24 months.

The study group included 969 patients: 300 patients underwent anterior lumbar interbody fusion (ALIF), 606 patients underwent transforaminal lumbar interbody fusion (TLIF), and 63 patients underwent lateral interbody fusion (LLIF). There was a significant correlation between the 12- and 24-month ODI ($r = 0.82$; $p < 0.0001$), SF-36 Physical Component Summary score ($r = 0.89$; $p < 0.0001$), VAS-back pain ($r = 0.90$; $p < 0.0001$), and VAS-leg pain ($r = 0.85$; $p < 0.0001$). For the ALIF cohort, patients achieving MCID thresholds for ODI at 12 months were 13-fold ($p < 0.0001$) more likely to achieve MCID at 24 months. Similarly, for the TLIF and LLIF cohorts, patients achieving MCID thresholds for ODI at 12 months were 13-fold and 14-fold ($p < 0.0001$) more likely to achieve MCID at 24 months. Outcome measures obtained at 12 months postoperatively are highly predictive of 24-month outcomes, independent of the surgical procedure.

In a multiinstitutional prospective study, patient-centered measures of surgical effectiveness obtained at 12 months adequately predict long-term (24-month) outcomes after lumbar spine surgery. Patients achieving MCID at 1 year were more likely to report meaningful and durable improvement at 24 months, suggesting that the 12-month time point is sufficient to identify effective versus ineffective patient care [2].

Age in Lumbar spine surgery outcome

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Return to Work After Lumbar Spine Surgery

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The Social Deprivation Index and lumbar spine surgery

Social Deprivation Index values range from 0 (no distress/prosperous) to 100 (highest distress). A study investigated the association between SDI and lumbar spine surgery outcomes.

A retrospective cross-sectional study was performed using electronic health record data from a multihospital academic health system from 2017 to 2024. Eligible patients included adults who underwent lumbar fusion or decompression alone. The primary exposure of interest was the binary SDI (low distress [SDI < 50] vs high distress [SDI ≥ 50 and ≤ 100]). SDI was associated with the patient's zip code of residence. The associations between SDI category and pain reduction, physical

function improvement, length of stay, and 30-day readmission were examined. Both unadjusted and adjusted regression models were created. Adjusted models included the following covariates: age, comorbidities, race, insurance, and surgery type. Multiple imputation by chained equations was used to impute missing values.

The total sample included 7598 patients with 5139 in the low-SDI group and 2459 in the high-SDI group. The SDI category was not significantly associated with the likelihood of pain reduction or physical function improvement after surgery. In the adjusted model, residence in a high-SDI area was significantly associated with extended length of stay (OR 1.21, 95% CI 1.07-1.36, p = 0.002). In the unadjusted model, patients from high-SDI areas were significantly more likely to experience 30-day readmission (OR 1.35, 95% CI 1.07-1.71, p = 0.01). In the adjusted model, this association was no longer statistically significant (OR 1.00, 95% CI 0.74-1.36, p ≥ 0.99).

Patients from high-SDI areas had similar pain and physical function outcomes compared to patients from low-SDI areas after lumbar spine surgery. High SDI was significantly associated with length of stay. This study highlights the need for interventions that address the unique needs of patients from low-resource settings to improve lumbar spine surgery outcomes [3)]

This study provides valuable insights into the role of social deprivation in lumbar spine surgery outcomes, particularly about the length of stay. However, the lack of significant associations with pain reduction and physical function, as well as the inconsistent findings on readmission rates, suggest that SDI alone may not fully capture the socioeconomic barriers influencing surgical recovery. Future research should refine SDI stratification, consider additional confounders, and propose specific interventions to mitigate disparities in surgical outcomes.

1)
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