Defining the Relative Utility of Lumbar Spine Surgery: A Systematic Literature Review of Common Surgical Procedures and their Impact on Health States

Scott L. Parker MD; Saniya S. Godil MD; Marcus J. Gates; Matthew McGirt MD
Spinal Column Surgical Quality and Outcomes Research Laboratory
Department of Neurosurgery, Vanderbilt University Medical Center

Introduction

Recently, the importance of measuring quality of life gains after surgical procedures has been revealed, as it will prove critical for health policy makers to assess relative effectiveness and value of various surgical procedures and help direct health care expenditure in an efficient and cost effective manner. We conducted this systematic review to compare the baseline and postoperative EQ-5D utility scores for common surgical procedures reported in the literature to obtain post-operative quality-adjusted life year (QALY) gains and establish the relative utility of lumbar spine surgery as compared to other surgical procedures commonly performed in the U.S. healthcare system.

Methods

A systematic literature review was conducted to identify all studies reporting preference-based general health state instrument EuroQol-5D (EQ-5D) after surgical procedures. Studies reporting preoperative/baseline EQ-5D scores as well as post-operative EQ-5D scores were included. For each study, the number of patients included and baseline/preoperative and follow-up mean EQ-5D index score was recorded. Mean quality-adjusted life year (QALY) gain for each intervention was calculated.

Results

A total of 67 studies comprising 95,014 patients were identified. Patients with lumbar spondylosis had the lowest preoperative EQ-5D score (0.36), followed by knee osteoarthritis and hip osteoarthritis, Table 1. The greatest QALY gain was seen in patients undergoing hip arthroplasty (0.38), knee arthroplasty (0.35) and lumbar spine surgery (0.32), nearly 2.5-fold greater QALY gained than for all other surgical procedures, Figure 1.

Conclusions

Patients with lumbar spondylosis have the worst reported HRQOL at baseline compared to other surgical cohorts in the literature. This, coupled with the high prevalence of lumbar spondylosis, incurs a detrimental impact on the overall health of U.S. population. Lumbar spine surgery leads to significant QALY gains compared to other surgical procedures, highlighting the high utility and value of lumbar spine surgery compared to other common surgical procedures.

Table 1

Diagnosis	Number of Studies	Number of Patients	Pre-op EQ-5D Score	Diagnosis	Number of Studies	Number of Patients	Pre-op EQ-5D Score
Lumbar Spondylosis	21	10,971	0.36	Obstructed Defecation	1	379	0.73
Knee Osteoarthritis	7	13,173	0.37	BPH	1	228	0.76
Hip Osteoarthritis	11	49,417	0.39	Colon Cancer	1	285	0.76
PAD	6	1,099	0.49	Urethral Stricture	1	49	0.77
Post-Lingual hearing Loss	1	11	0.52	Varicose Vein	3	9,789	0.77
Organ Transplant	5	867	0.56	Inguinal Hernia	2	2,714	0.79
Cardiac Diseases	4	2,673	0.60	Cataract	2	1,274	0.83
Haemorrhoids	1	30	0.70	Prostate Cancer	1	127	0.89
Gynecological Diseases	6	1,928	0.72				

Table 2

Diagnosis / Procedure	Number of Studies	Number of Patients	Pre-op Mean EQ-5D Index (SD)	Mean EQ-5D Index at 1-year (SD)	QALY Gained
LUMBAR SPONDYLOSIS	21	10971	0.36	0.68	0.32
Microdiskectomy	7	1706	0.43	0.80	**0.37**
Decompressive Laminectomy	6	5426	**0.36**	0.62	0.26
Lumbar Fusion	6	782	0.45	0.70	0.25
Disc Arthroplasty	6	2731	**0.33**	0.73	**0.40**

Figure 1