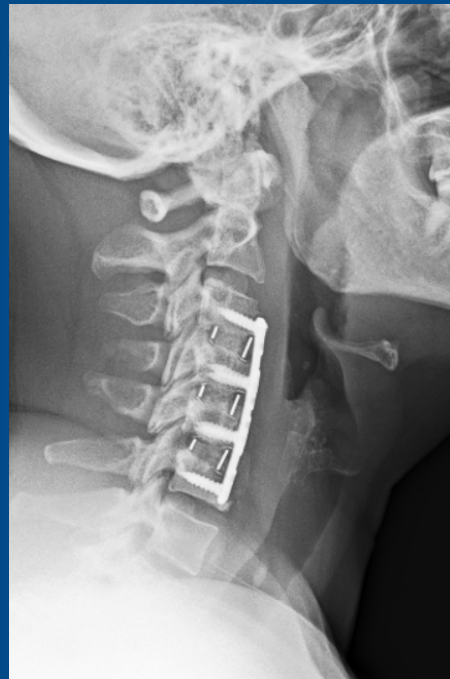




INDUCE BIOLOGICS

CASE COMPENDIUM & COST ANALYSIS: LUMBAR AND CERVICAL SURGICAL OUTCOMES WITH **NMP® BIOIMPLANT**

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LUMBAR CASE REPORT: CM (L4-S1 ALIF, DECOMPRESSION, PSF)

Patient History and Demographics 59 yo female, 1 pack/day smoker x 30 years, no alcohol/drugs, maintenance worker

Pain/Disability Score VAS: 10 ODI: 64

Radiograph/MRI Reading L4-S1 severe lumbar DDD, severe foraminal stenosis

Diagnosis Lumbar DDD, Foraminal Stenosis, Foot Drop, Radiculopathy

Surgery Goal Restoration of disc and foraminal height, decompression of affected nerve roots, achieve arthrodesis

Approach and Procedure L4-S1 ALIF, minimally invasive decompression, posterior spinal fusion. Post op instruction: incrementally decreasing lifting restriction through 9 months.

Grafting Material Used:

Large NMP, Crushed + allograft bone extender

Pain Assessment

3 Months VAS: 4 ODI: 27

9 Months VAS: 1 ODI: 8

Fusion Assessment

3 Months Development of arthrodesis

9 Months Solid arthrodesis on flexion/extension

Outcome

No complications or readmissions. Patient returned to full duty as maintenance worker/instructor at trade school without restriction or disability.



Figure 1 Lumbar

Pre-Op Lateral



Figure 2 Lumbar

3 Month Post-Op Lateral

Pain Assessment

VAS: 4; ODI: 27

Fusion Assessment

Development of arthrodesis



Figure 3 Lumbar

9 Month Post-Op Lateral

Pain Assessment

VAS: 1; ODI: 8

Fusion Assessment

Solid arthrodesis on flexion/extension

CERVICAL CASE REPORT: MP (C3-4, 4-5, 5-6 ACDF)

Patient History and Demographics 60 yo female, 1.5 pack/day smoker, 3 drinks/week, unemployed

Pain/Disability Score VAS: 8 NDI: 62 mJOA: 11

Radiograph/MRI Reading Degenerative disc disease C3-6, several central stenosis, with cord compression and T2 hyperintensity in spinal cord at C3-4 and C5-6, several bilateral foraminal stenosis C3-4, C4-5, C5-6

Diagnosis Cervical Myeloradiculopathy

Surgery Goal Decompression of the spinal cord and bilateral nerve roots C3-6, solid arthrodesis

Approach and Procedure ACDF C3-4, 4-5, 5-6. Post op instruction: Soft collar when active, no lifting > 10-15 pounds months 3-6.

Grafting Material Used:

2 x-small NMP, crushed + allograft bone extender

Pain Assessment

3 Months VAS: 2 NDI: 15 mJOA: 15

8 Months VAS: 1 NDI: 13 mJOA: 15

Fusion Assessment

Radiographic Evidence: Arthrodesis demonstrated on x-ray at 3 and 8 months postoperatively

Advanced imaging: Incidental MRI obtained at 9 months (following motor vehicle accident) showed fusion at all operative levels

Outcome

Profound improvement in pain and disability scores. The patient, who had been unable to work in the months prior to surgery due to her symptoms, returned to her role as a secretary/administrative assistant at 4 months postoperatively without difficulty or disability.



Figure 4 Cervical

Top: Pre-Op MRI

Bottom: 9 Month MRI

Fusion Assessment

Fusion across all operative levels



Figure 5 Cervical

3 Mo Post-Op Lateral

Pain Assessment

VAS: 2; NDI: 15; mJOA: 15

Fusion Assessment

Development of arthrodesis



Figure 6 Cervical

8 Mo Post-Op Lateral

Pain Assessment

VAS: 1; NDI: 13; mJOA: 15

Fusion Assessment

Arthrodesis

In the cases presented, Dr. Seal utilized NMP as the primary biologic to support bony fusion in both the cervical and lumbar spine. In prior similar cases, he used INFUSE (rhBMP-2) or iFACTOR. INFUSE for lumbar fusion and iFACTOR for cervical fusion. The substitution maintained identical surgical objectives while offering a significant reduction in biologic cost per case.

THEORETICAL COST SAVINGS WITH NMP® BIOIMPLANT			
2-LEVEL ALIF WITH POSTERIOR FIXATION			
Previous Biologic Approach	▶▶▶	Current Biologic Approach	Relative Cost Difference
INFUSE® + Cancellous chips + DBM		NMP® + Allograft bone extender	↓ ~ 29% reduction in biologic cost
3-LEVEL ACDF			
Previous Biologic Approach	▶▶▶	Current Biologic Approach	Relative Cost Difference
i-FACTOR®		NMP® + Allograft bone extender	↓ ~ 26% reduction in biologic cost

In both procedures, the surgeon achieved successful fusion at 9 months with no product-related complications. By transitioning from INFUSE and i-FACTOR to NMP, the biologic cost per case was reduced significantly, without altering the surgical technique, and resulted in solid arthrodesis with notable improvements in patient pain and disability scores.

Following these early results, the **hospital conducted an internal review** comparing biologic utilization for similar procedures over the previous year. Based on historical case volume and the relative cost difference observed, the facility estimated an **annual savings exceeding \$270,000** when substituting NMP for higher-cost alternatives such as INFUSE and i-FACTOR.

These results highlight how NMP can deliver clinically comparable outcomes with meaningful cost savings, supporting hospital value-analysis objectives and reducing biologic spend in multi-level fusion procedures.

Case study images and data courtesy of

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