



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

Patients with Bilateral Shoulder Arthritis Choose Contralateral Inlay Total Shoulder Arthroplasty Nearly Three Times More Frequently

Nicolette A. Schurhoff BS, Andrew A. Barrett MD,
Samuel Bauer MD, Camila A. Torres-Caiaffa BA,
Alexandra D. Moutafis BS, Matthias R. Schurhoff MD,
Luis A. Vargas MD PhD, John E. Zvijac MD, John W. Uribe MD



Baptist Health
Orthopedic Institute



Herbert Wertheim
College of Medicine



United States
of America



Faculty Disclosure Information

None of the authors have any financial conflicts to disclose in conjunction with the content of this study.

General financial disclosures for all authors are available on the American Academy of Orthopedic Surgeons



Background

- A national US database with 27,962 total shoulder arthroplasties (TSA) reported an incidence of bilateral TSA of 6.3%¹
- US TSA utilization is dominated by reverse (44.7%) and anatomic (40.1%) procedures – combined 85.0% (2015-2023)²
- A recent systematic review reported significant improvement in functional outcomes and high patient satisfaction (range: 81-100%) following bilateral TSA³



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



Baptist Health
Orthopedic Institute

FIU

Herbert Wertheim
College of Medicine



Study Objectives

Purpose

- Determine the incidence rate of bilateral procedures with inlay Total Shoulder Arthroplasty (iTSA)
- Examine patient-reported outcomes (PROs) after staged iTSA for advanced glenohumeral osteoarthritis

Hypothesis

- The incidence of bilateral procedures within our series of more than 500 cases exceeds the national rate of total shoulder arthroplasty



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



Baptist Health
Orthopedic Institute

FIU

Herbert Wertheim
College of Medicine



Methods

Study Design

- Retrospective review of prospectively collected data (2011-2024)

Inclusion Criteria

- Bilateral advanced glenohumeral arthritis treated with iTSA
- All postoperative timepoints

Exclusion Criteria

- Unilateral iTSA

Radiographic Assessments

- Walch: Glenoid Morphology
- Samilson-Prieto: OA Grade

Contralateral Surgical Timing

- <12 months (Group I), 12-24 (Group II), >24 months (Group III)

Data Collection

- Preoperative Risk: ASA Classification
- Intraoperative: Blood loss, complication rate
- Outcomes: ASES, VAS-Pain
- Range of motion (ROM): Forward elevation, external rotation
- **Statistics: Rstudio (2024.12.0+467)**
Linear Model ANOVA: Comparative analysis by age (Group Ia: < 65, Group IIa: ≥ 65)
- Paired t-tests: normally distributed data
Wilcoxon: non-normally distributed data



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



Baptist Health
Orthopedic Institute



Herbert Wertheim
College of Medicine

Study Population

- 79 pts (158 shoulders) of 436 tracked pts (515 shoulders) underwent bilateral iTSA
- **Bilateral incidence rate: 18.1%**
- Age Group: 58 shoulders <65 years old (Ia), 100 ≥65 (IIa)

Table 1. Contralateral Procedure Interval

Group	Interval	Count (%)	Mean Contralateral Procedure Time
I	<12 mo	35 (44.3%)	5.3 ± 2.5 mo
II	12-24 mo	12 (15.2%)	15.3 ± 3.0 mo
III	>24 mo	32 (40.5%)	65.1 ± 31.4 mo

Table 2. Patient Characteristics

Age	67.1 ± 9.5 years
Gender	52 Males, 27 Females
BMI	28.7 ± 5.1
ASA Classification	I (5.1%), II (51.9%), III (43.0%), IV-V (0%)
Contralateral procedure interval	Median: 14 (5-45) months
Mean follow-up time	42.5 ± 37.2 months

Radiographic Imaging

Table 2. Preoperative Staging

Classification	Category	Percentage
Walch Classification	A1	30.9%
	A2	18.4%
	B1	3.3%
	B2	44.8%
	B3	2.6%
Samilson-Prieto	Grade 0	0%
	Grade 1	2.6%
	Grade 2	11.9%
	Grade 3	85.4%

Figure 1A,B: 2013 Preop R and 10yr Postop R

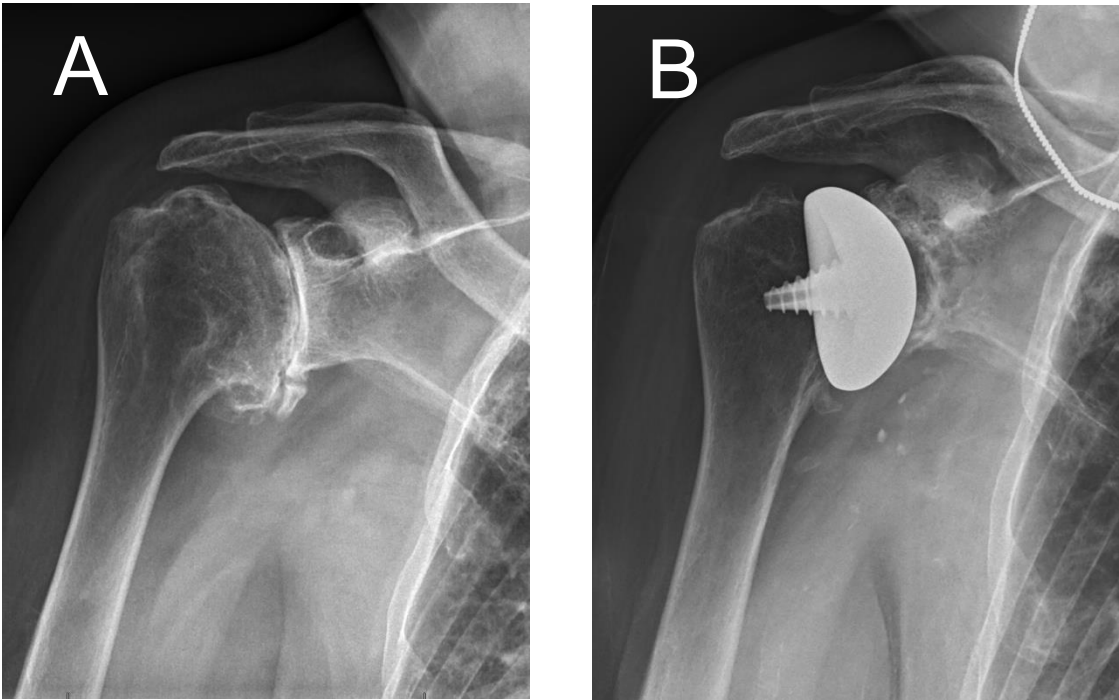
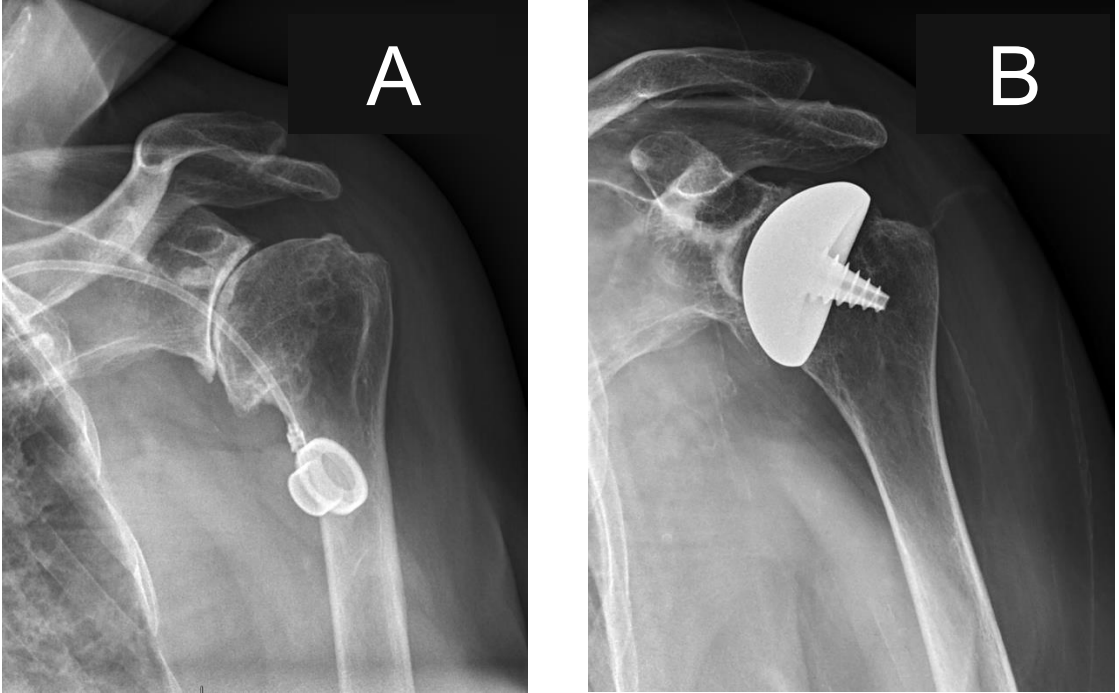


Figure 2A,B: 2013 Preop L and 11yr Postop L



Results

- All PROs improved significantly ($p < .001$)
- Gender, age, and bilateral sequence did not impact last follow-up PROs and ROM ($p > 0.05$)

Table 3. Patient Reported Outcomes

Outcome Score	Preop	Last Follow-up
ASES	33.6 (21.7-46.7)	83.3 (60.4-95.0)
VAS- Pain	6.9 (5.0-8.0)	1.0 (0.0-3.0)

Table 4. Range of Motion

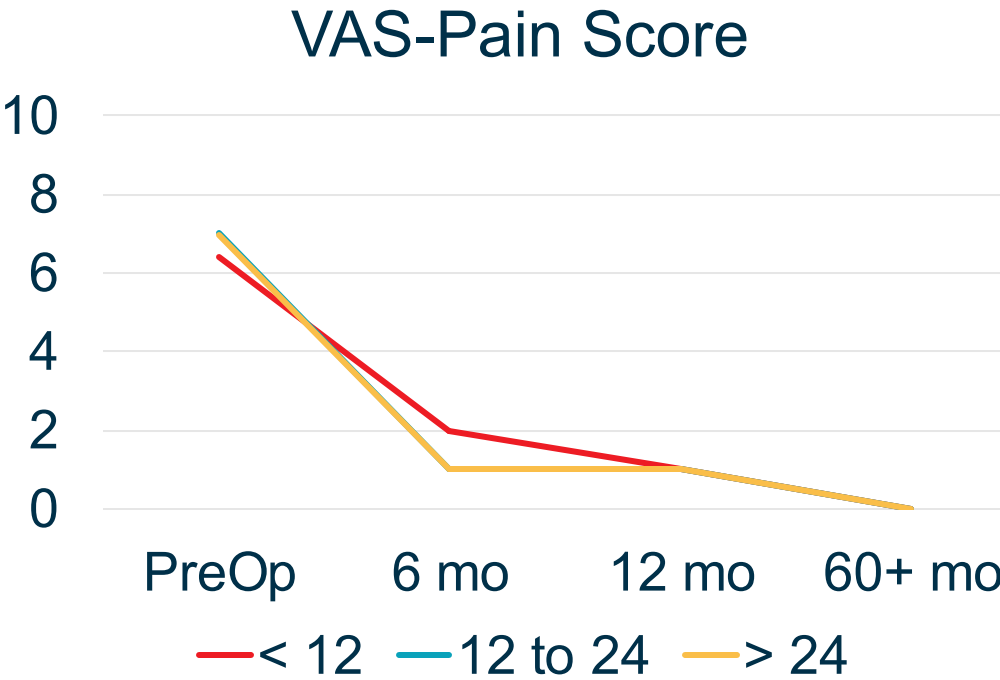
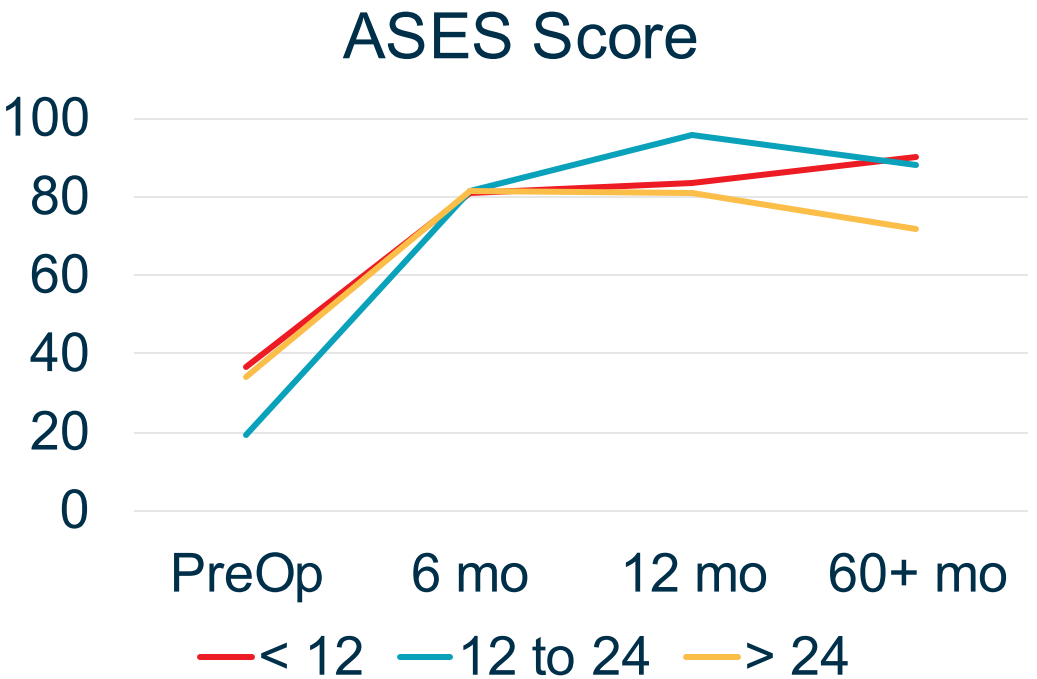
Range of Motion	Preop	Last Follow-up
Forward Elevation	90.0° (80.0-130.0)	160.0° (145.0-170.0)
External Rotation	20.0° (10.0-30.0)	50.0° (40.0-60.0)

Results Cont.

- Median PROs significantly improved (p<0.001) from baseline in all three groups prior to contralateral iTSA

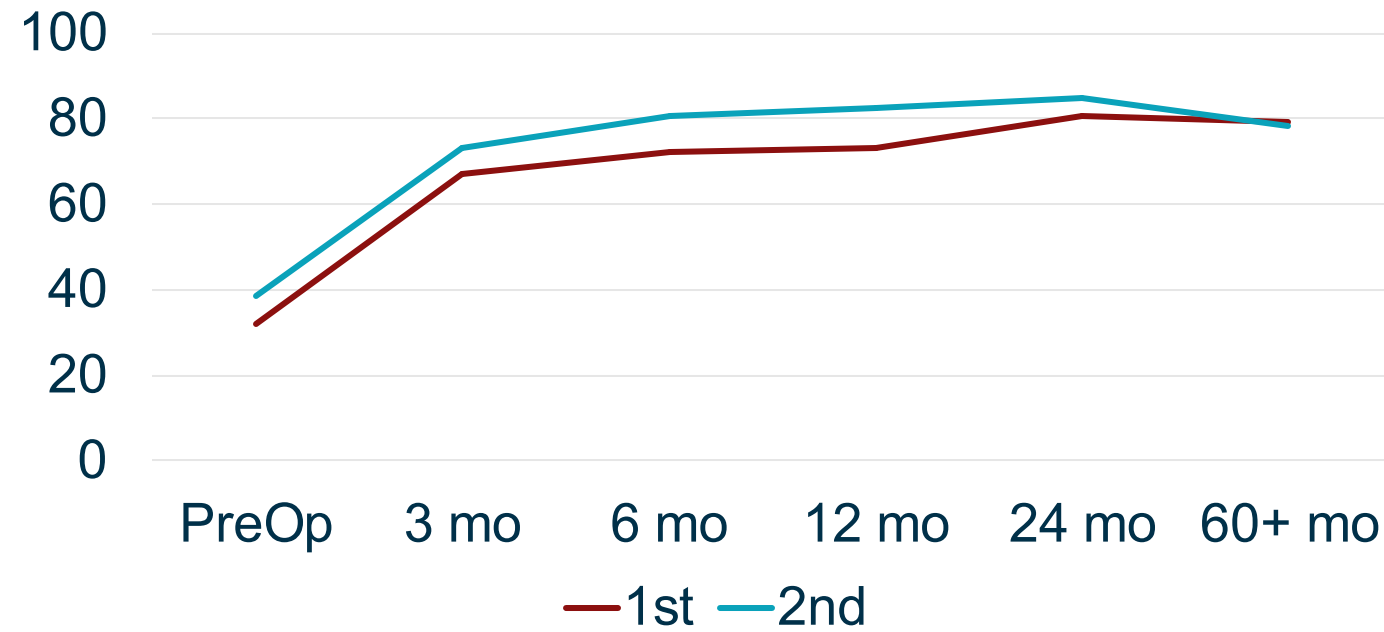
Table 5. PROs at Time of Contralateral Procedure

Group	Mean Contralateral Procedure Time	Index Shoulder PROs at Contralateral iTSA	
		ASES	VAS-Pain
<12 mo	5.3 ± 2.5 mo	80.9 (69.6-90.0)	2 (1-3)
12-24 mo	15.3 ± 3.0 mo	95.9 (52.5-98.7)	0 (0-4)
>24 mo	65.1 ± 31.4 mo	71.7 (50.0-91.7)	1 (0-4)

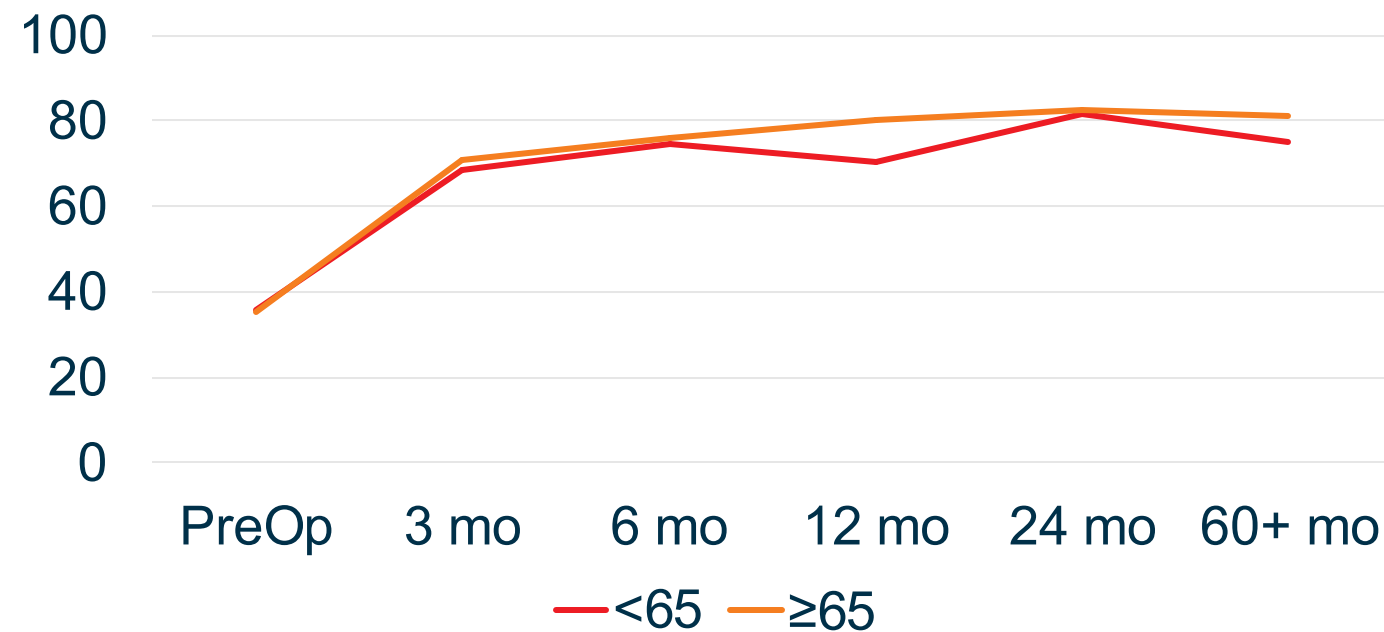


Age Stratification

ASES Score by Sequence



ASES Score by Age

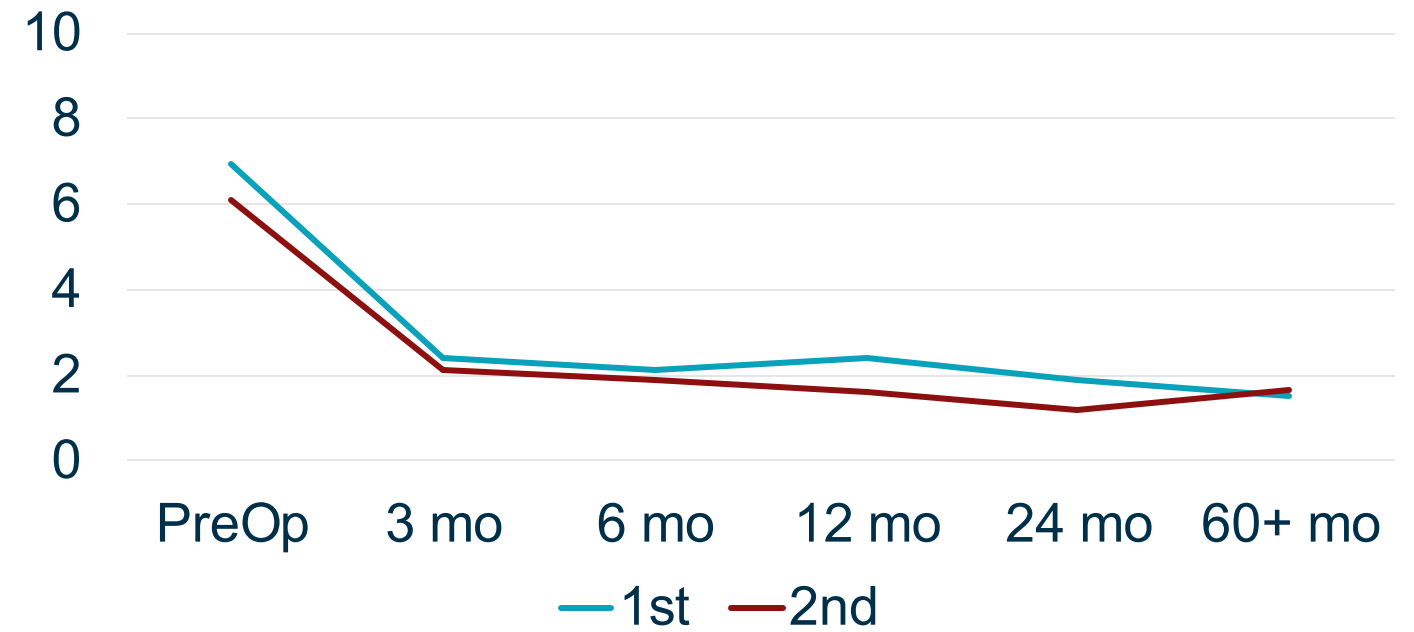


Baptist Health
Orthopedic Institute

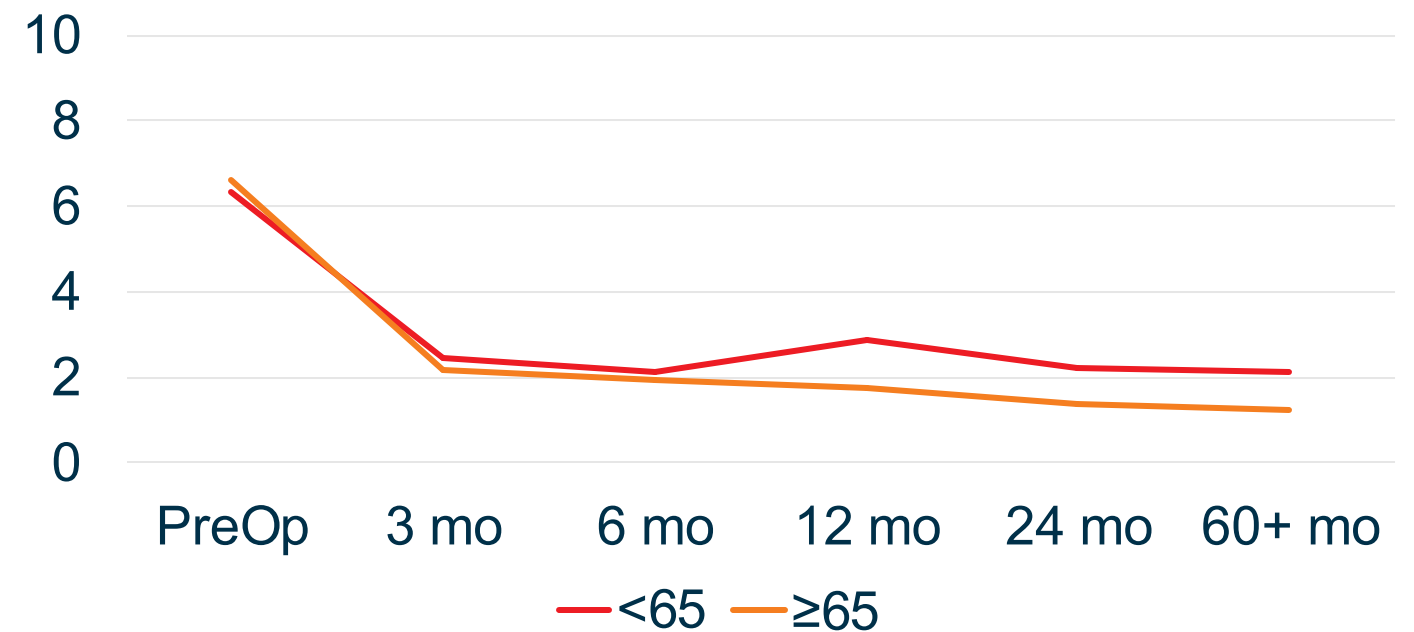


Herbert Wertheim
College of Medicine

VAS-Pain Score by Sequence



VAS-Pain Score by Age





Conclusion

- Patients treated with iTSA for advanced bilateral glenohumeral arthritis chose to undergo contralateral procedures three times more frequently than previously reported
- Significant pain relief and functional improvements were observed after staged bilateral procedures
- Most patients (84.8%) decided to undergo contralateral iTSA within 1 year or after 2 years following their indexed procedure
- Our results provide a patient-centric validation for the treatment of advanced bilateral shoulder arthritis



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



Baptist Health
Orthopedic Institute

FIU

Herbert Wertheim
College of Medicine

References

1. Walters JD, Denard PJ, Brockmeier SF, Werner BC. The relationship of bilateral shoulder arthroplasty timing and postoperative complications. J Shoulder Elbow Surg 2021;30:317-323
2. Shoulder & Elbow Registry (SER): 2024 Annual Report. Rosemont, IL: American Academy of Orthopaedic Surgeons (AAOS), 2024
3. Smith JRH, Houck DA, Hart JA, et al.: Bilateral total shoulder arthroplasty: A systematic review of clinical outcomes. Shoulder Elbow 2021;13:402-415.



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



Baptist Health
Orthopedic Institute

FIU

Herbert Wertheim
College of Medicine