Journal Club: Top 6 Knee Articles of the Year

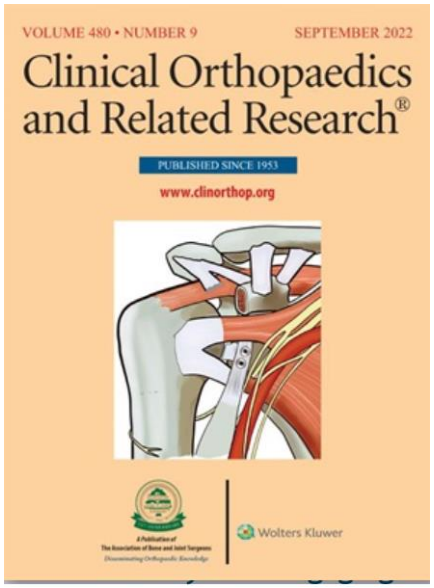
Alfred Kuo, MD, PhD

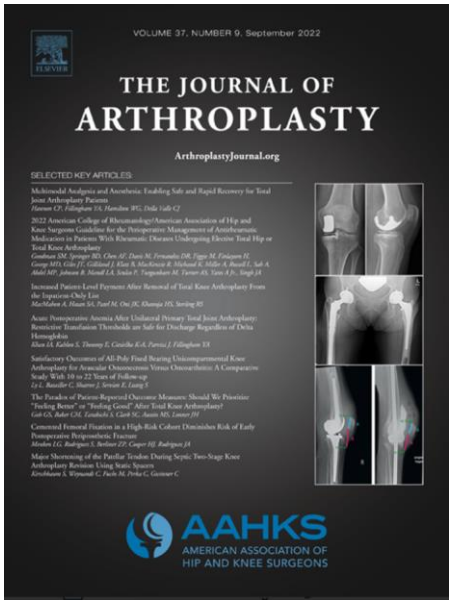
UCSF Department of Orthopaedic Surgery

San Francisco VA Medical Center

Time frame: July 2021-September 2022

Journals

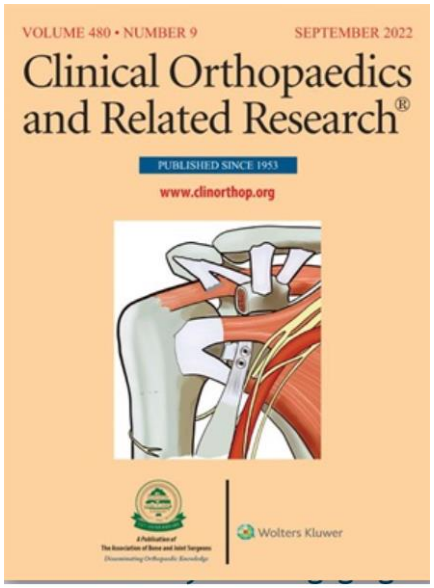

VOLUME 480 • NUMBER 9
SEPTEMBER 2022
Clinical Orthopaedics and Related Research®
PUBLISHED SINCE 1953
www.clinorthop.org
Wolters Kluwer

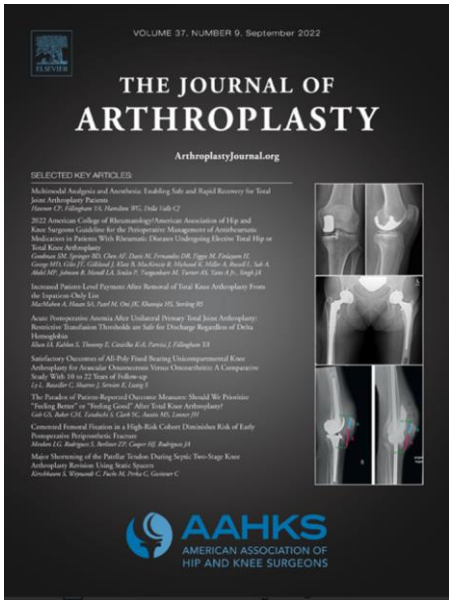

VOLUME 37, NUMBER 9, September 2022
THE JOURNAL OF ARTHROPLASTY
ArthroplastyJournal.org
SELECTED KEY ARTICLES:
AAHKS
AMERICAN ASSOCIATION OF HIP AND KNEE SURGEONS


THE
BONE & JOINT JOURNAL
THE BONE & JOINT JOURNAL
EST. 1948
Celebrating 70 years of orthopaedic excellence


THE JOURNAL OF BONE & JOINT SURGERY
JB&JS
EXCELLENCE THROUGH PEER REVIEW

Journals


VOLUME 480 • NUMBER 9
SEPTEMBER 2022
Clinical Orthopaedics and Related Research®
PUBLISHED SINCE 1953
www.clinorthop.org
Wolters Kluwer


VOLUME 37, NUMBER 9, September 2022
THE JOURNAL OF ARTHROPLASTY
ArthroplastyJournal.org
SELECTED KEY ARTICLES:
AAHKS
AMERICAN ASSOCIATION OF HIP AND KNEE SURGEONS


THE
BONE & JOINT JOURNAL
THE BONE & JOINT JOURNAL
EST. 1948
Celebrating 70 years of orthopaedic excellence

Topics

New Technologies

Infection

Preoperative Optimization

New Technology

■ KNEE

Intraoperative pressure sensors improve soft-tissue balance but not clinical outcomes in total knee arthroplasty: a multicentre randomized controlled trial

S. J. MacDessi,
J. A. Wood,
A. Diwan,
I. A. Harris,
on behalf of the
SENSOR BALANCE
Study Group

From Sydney Knee Specialists, Sydney, Australia

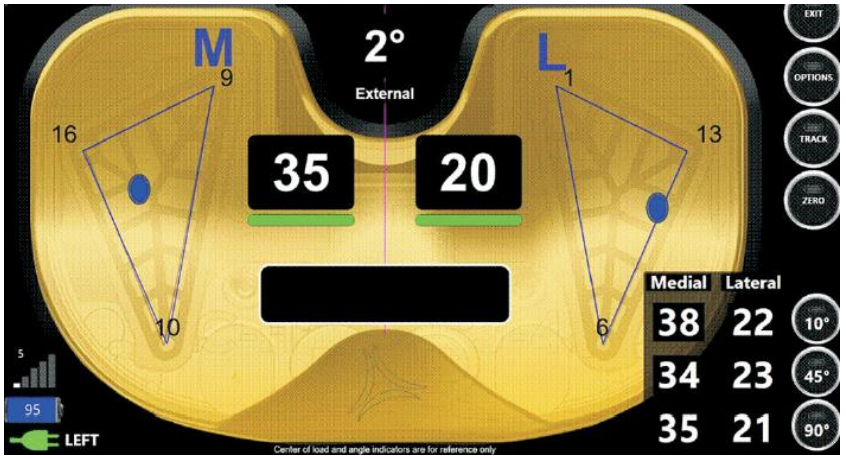
Bone Joint J
2022;104-B(6):004–012.

Manual soft-tissue balancing

- Subjective
- Surgeon dependent
- Cause of dissatisfaction?

Sensor-Assisted TKA

- Wireless intraoperative load sensors
- Measures real-time loads and location in the medial and lateral compartments
- Ideal load distribution is unknown
- Estimated cost $500/case



Clinics in Orthopedic Surgery 2021;13:1-9 • https://doi.org/10.4055/cios20034

Possible advantages of Sensor-assisted TKA vs Manual balancing

- Improvement in PROMs?
- Better range of motion?
- Decreased arthrofibrosis/manipulation under anesthesia?

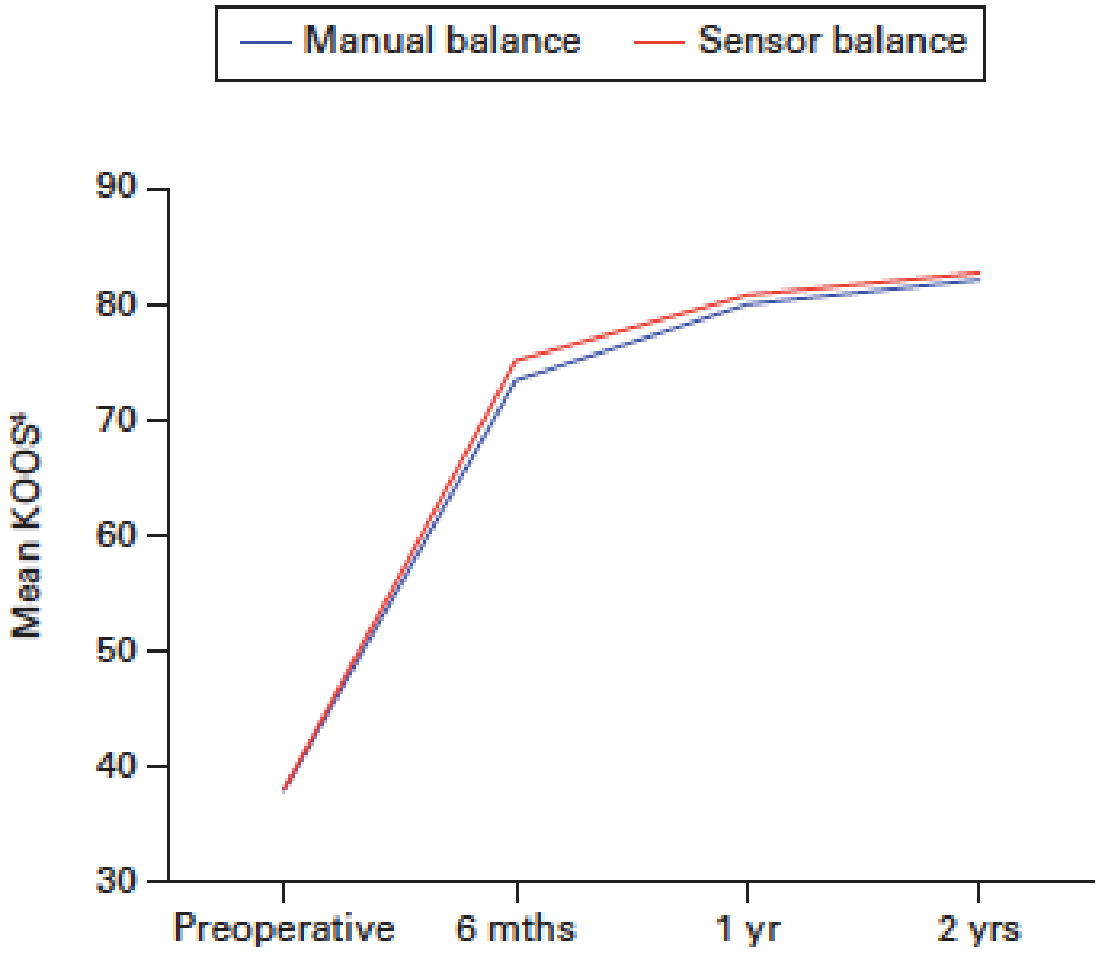
Methods

- Multicenter randomized controlled trial
- Patients randomized to manual balancing or sensor balancing
- “Balance” defined as
  - intercompartmental pressure difference of 15 psi or less with a compartmental pressure between 5 and 40 psi in at least two positions (10 degrees, 45 degrees, 90 degrees of flexion)

Results

- More patients in the Sensor group achieved “balance”
- No difference in knee-specific or general health PROMs
- No difference in ROM or arc of motion

Results


Manual balance
Sensor balance
Mean KOOS¹
90
80
70
60
50
40
30
Preoperative
6 mths
1 yr
2 yrs

Authors’conclusion

- “These results question whether a more precisely balanced TKA that is guided by sensor data…will ultimately have a significant effect on clinical outcomes.”

Clin Orthop Relat Res (2022) 480:1535-1544
DOI 10.1097/CORR.0000000000002168

Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

Clinical Research

No Benefit to Sensor-guided Balancing Compared With Freehand Balancing in TKA: A Randomized Controlled Trial

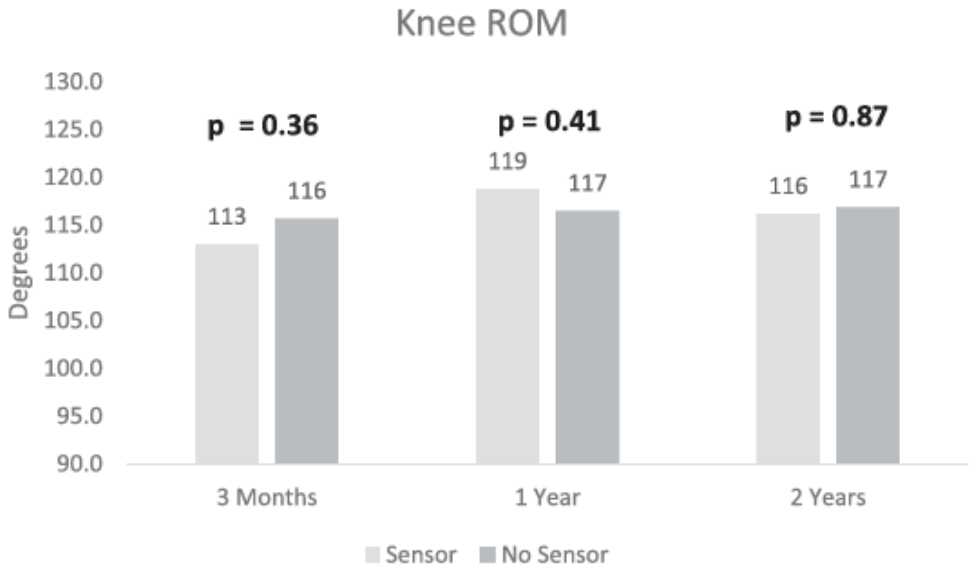
Nana O. Sarpong MD, MBA[1], Michael B. Held MD, MBA[1], Matthew J. Grosso MD[1], Carl L. Herndon MD[1], Walkania Santos BS[1], Akshay Lakra MD[1], Roshan P. Shah MD, JD[1], H. John Cooper MD[1], Jeffrey A. Geller MD[1]

Methods

- Single-institution randomized controlled trial
- Patients randomized to manual balancing (“freehand”) or sensor balancing
- VERASENSE® used
- “Balance” defined as
  - intercompartmental pressure difference of 15 psi or less at 0 degrees, 45 degrees, and 90 degrees of flexion

Results

- No clinically important difference in PROMs at 3 months, 1 year, or 2 years
- No difference in range of motion arc at 3 months, 1 year, or 2 years
- Increased operative time in sensor group (23 minutes)



Authors’conclusion

- “Given the significantly increased operative time and costs associated with the use of a sensor-balancing device, we recommend against its routine use in clinical practice by experienced surgeons.”

Infection

Clin Orthop Relat Res (2021) 479:2504-2512
DOI 10.1097/CORR.0000000000001919

Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

Clinical Research

Intraosseous Regional Prophylactic Antibiotics Decrease the Risk of Prosthetic Joint Infection in Primary TKA: A Multicenter Study

Ben Parkinson MBBS, FRACS (Orth), FAOrthA[1-3], Peter McEwen MBBS, FRACS (Orth), FAOrthA[2-4], Matthew Wilkinson MBBS, FRACS (Orth), FAOrthA[2-4], Kaushik Hazratwala MBBS, FRACS (Orth), FAOrthA[2-4], Jorgen Hellman B.med, FRACS (Orth), FAOrthA[5], Heng Kan MBBS[1], Andrew McLean MBBS[1], Yash Panwar MBBS[5], Kenji Doma PhD, BSpExcSci(Hons), MClinExPhys(Rehab), CSCS, AEP, NSCAM, ESSAM[2,3], Andrea Grant BSpExSci[2]

Regional medication delivery: achieves higher local tissue concentrations (example: Bier block)

Intraosseous delivery: proximal tibia

Antibiotics **2022**, *11*, 634. https://doi.org/10.3390/antibiotics11050634

Intraosseous needle ($60-$70)

Methods

- Multicenter retrospective review of primary TKA
- Regional (intraosseous regional +/- systemic IV) versus systemic IV alone
- Vancomycin and/or Cefazolin
- Endpoint: PJI within one year

Results: Univariate (unadjusted)

- Lower 1 year infection rate with regional vs systemic antibiotics

Antibiotic Delivery	**Infection Rate**	**P-value**
Regional Intraosseous	0.10%	0.03
Systemic IV	1.40%	

Results: Infection rate stratified by risk factors

Parameter	Regional antibiotics	Systemic antibiotics	Relative Risk (P value)
BMI			
> 35 kg/m2	0.60%	1.70%	0.36 (0.36)
< 35 kg/m2	0%	1.40%	0.07 (0.06)
Diabetes			
Yes	1.50%	6.6%	0.25 (0.2)
No	0%	1%	0.07 (0.07)
Renal failure			
Yes	0%	23.1%	0.24 (0.33)
No	0%	1.30%	0.07 (0.08)

Authors’conclusion

- “Surgeons should consider administering regional prophylactic antibiotics in primary TKA to reduce the risk of early PJI.”

The Journal of Arthroplasty 37 (2022) 226–231

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.o

Primary Hip and Knee Arthroplasty

Dilute Povidone-Iodine Irrigation Reduces the Rate of Periprosthetic Joint Infection Following Hip and Knee Arthroplasty: An Analysis of 31,331 Cases

Noam Shohat, MD [a, *], Graham S. Goh, MD [b], Samantha L. Harrer, MD [b], Scot Brown, MD [b]

Methods

- Single institution retrospective review of primary TKA and THA
- Dilute povidone iodine vs saline irrigation
- Endpoint: PJI with at least one year of follow-up

Results: Univariate (unadjusted)

- Lower infection rate with povidone iodine vs saline irrigation

Irrigation solution	Infection Rate	P-value
Povidone iodine	0.60%	< 0.001
Saline	1.30%	

Results: Variables associated with lower odds of PJI (multivariable logistic regression)

Variable	**Adjusted Odds Ratio (P-value)**
Povidone iodine	0.40 (< 0.001)
Spinal anesthesia	0.50 (< 0.001)
Female gender	0.56 (< 0.001)
Cefazolin	0.56 (< 0.001)
Lower ASA score	0.67 (< 0.001)

Is it cost-effective?

- Povidone iodine is cheap while PJI is expensive
- Povidone iodine might prevent 1 PJI for every 137 TJA patients

$25

Authors’conclusion

- “These findings support the use of povidone-iodine irrigation as a safe and cost-effective measure to reduce PJI.”

Preoperative Optimization

The Journal of Arthroplasty 36 (2021) 2452–2457

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

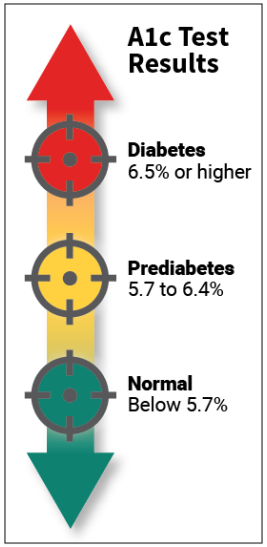
Primary Knee

Failure to Optimize Before Total Knee Arthroplasty: Which Modifiable Risk Factor is the Most Dangerous?

Nick R. Johnson, MD [a, c, *], Joseph M. Statz, MD [d], Susan M. Odum, PhD [b, c], Jesse E. Otero, MD, PhD [c, d]

Risk factors for complications

Smoking



Diabetes

Obesity

Malnutrition

Methods

- Retrospective analysis of data from the American College of Surgeons National Surgical Quality Improvement Program
- 2017 and 2018 TKA patients

Results: Multivariable logistic regression

		Odds ratios		
Risk Factor	**Death**	**Infection**	**Readmission**	**Any complication**
Malnutrition (Albumin < 3.5)	**7.2**	**3.8**	**2.4**	**3.7**
Obesity (BMI > = 40)	**1.9**	**2.1**	**1.5**	**1.3**
Smoking	2.2 (NS)	**2**	**1.4**	**1.4**
Diabetes mellitus	1.5 (NS)	1.1 (NS)	**1.4**	**1.4**

Authors’conclusion

- “Hypoalbuminemia appears to be the strongest risk factor for all complications evaluated. Special attention should be paid to preoperative nutritional optimization.”

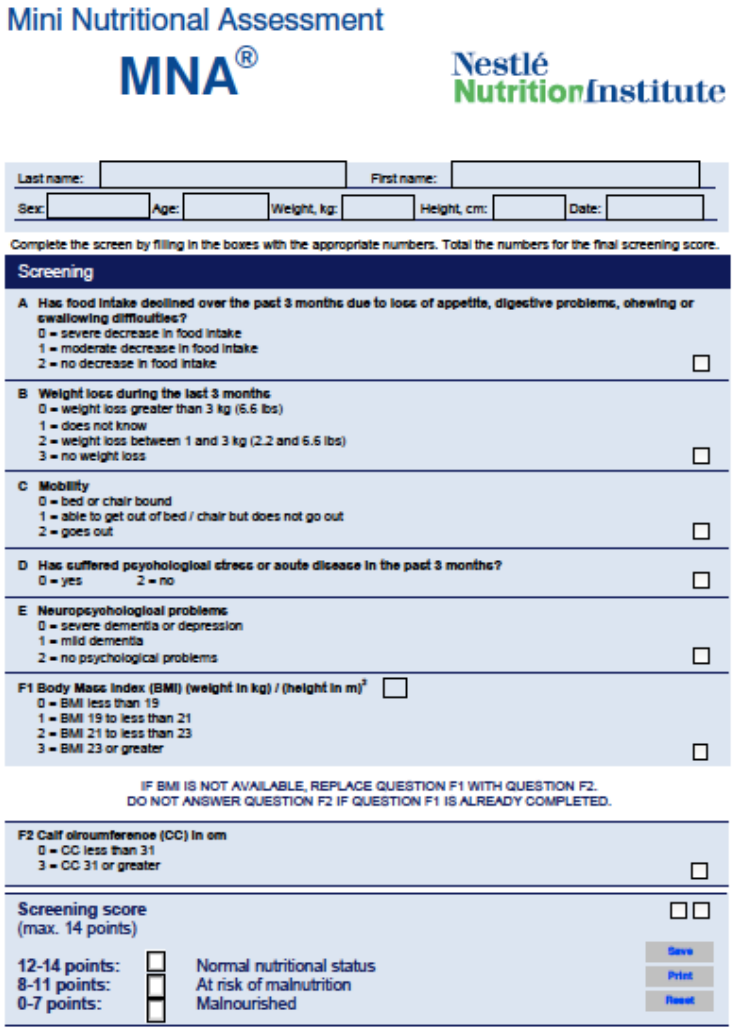
What is the best way to measure nutritional status?

Serum Albumin

Total Lymphocyte Count

Prealbumin

Transferrin



Mini Nutritional Assessment

MNA®

Nestlé Nutrition Institute

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F1 Body Mass Index (BMI) (weight in kg) / (height in m)² ☐
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score ☐☐
(max. 14 points)

12-14 points: ☐ Normal nutritional status
8-11 points: ☐ At risk of malnutrition
0-7 points: ☐ Malnourished

Save Print Reset

The Journal of Arthroplasty 37 (2022) S836–S841

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Primary Hip and Knee Arthroplasty

The Geriatric Nutritional Risk Index Is an Independent Predictor of Adverse Outcomes for Total Joint Arthroplasty Patients

Christopher J. Fang, MD [a, *], Ghulam H. Saadat, MD [b], Bennet A. Butler, MD [c], Faran Bokhari, MD [b]

Geriatric Nutrition Risk Index (GNRI)

- GNRI = (1.489 x **serum albumin**) + [41.7 x (**weight**/ideal weight)]
- Ideal weight depends on **height**
- Values define normal nutrition, moderate malnutrition, and severe malnutrition

Methods

- Retrospective analysis of data from the American College of Surgeons National Surgical Quality Improvement Program
- 2016 to 2019 TKA and THA patients

Results: Comparison to patients with normal nutrition (adjusted multivariable analysis)

	Severe Malnutrition
Outcome	Odds Ratio (P-value)
Transfusion	1.6 (< 0.0001)
Pneumonia	1.6 (0.01))
Surgical site infection	1.8 (< 0.0001)
Sepsis	2.0 (0.002)
Readmission	2.3 (<0.0001)
Revision Surgery	1.7 (<0.0001)
Mortality	1.8 (NS)

Authors'conclusion

- "Malnutrition, as defined by GNRI, is an independent predictor of adverse outcomes after TJA, including 30-day readmission, revision surgery, and increased LOS."

- **UNRESOLVED:** What is the best way to measure nutritional status?

Take home messages:

- Manual balancing results in similar clinical outcomes as sensor-assisted balancing
- Intraosseous regional antibiotics **may** reduce infection rates compared to IV systemic antibiotics
- Povidone iodine irrigation **may** reduce infection rates compared to saline irrigation
- Malnutrition **may** be a key modifiable risk factor for complications


stryker
Visum Surgical Light
UCSF