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Always cement

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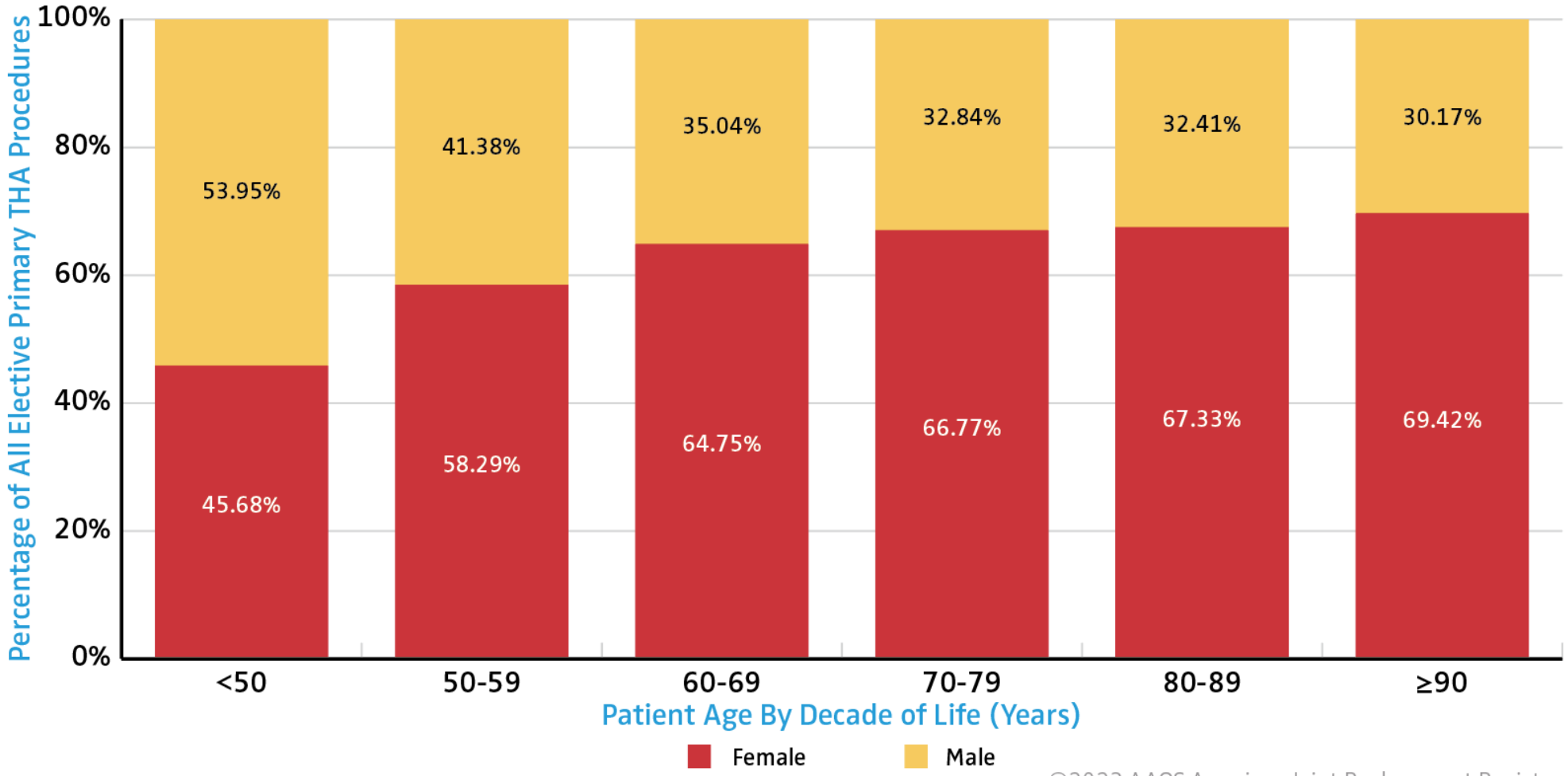
- Consultant: Depuy-Synthes
- Royalties: Depuy-Synthes
- Institutional Education and Research Support
  - OREF Omega Grant
  - Depuy-Synthes
  - The Hoag Foundation

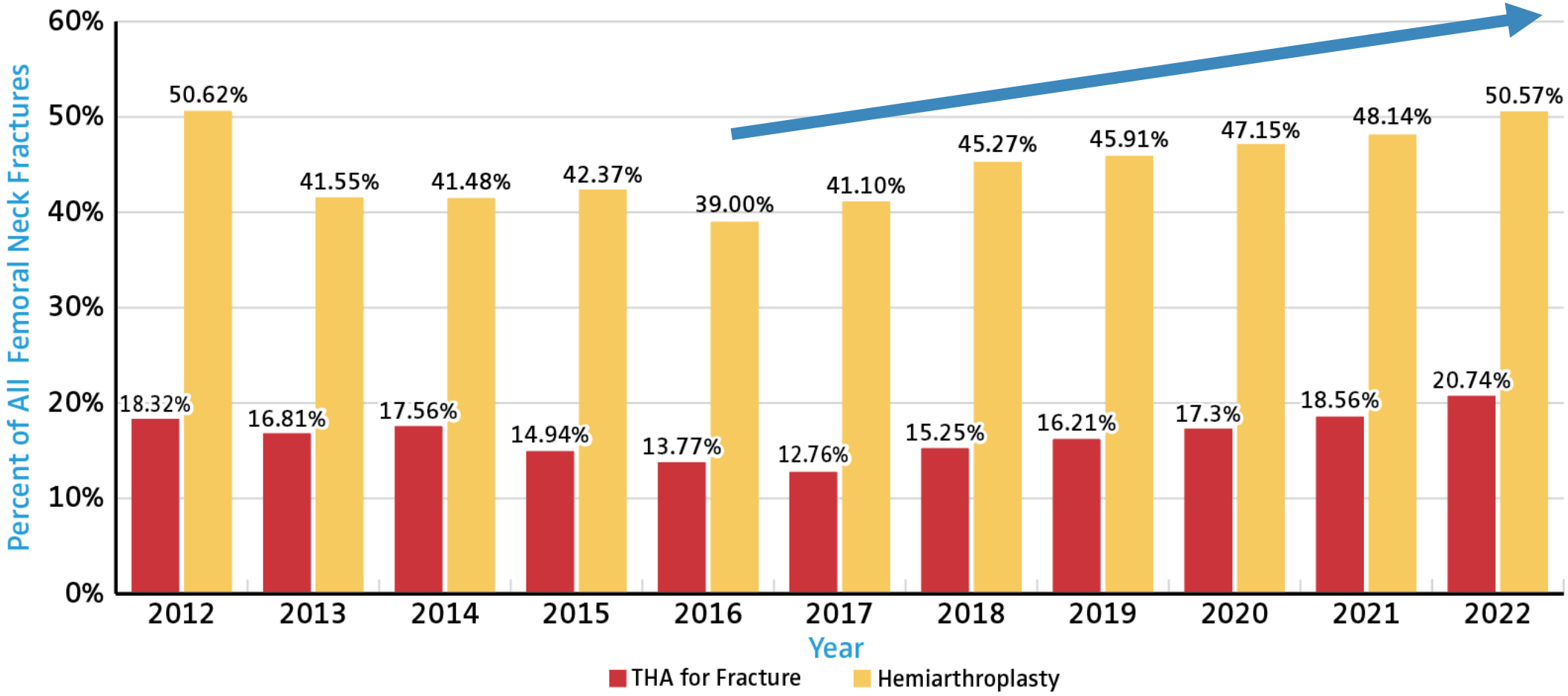
Current State

Sex Distribution for THA for Femoral Neck Fracture by Age Group, 2012-2022 (N=36,049)



Current State

Cemented Fixation for Femoral Stems in Total Hip Arthroplasty and Hemiarthroplasty for Femoral Neck Fracture, 2012-2022 (N=44,187)



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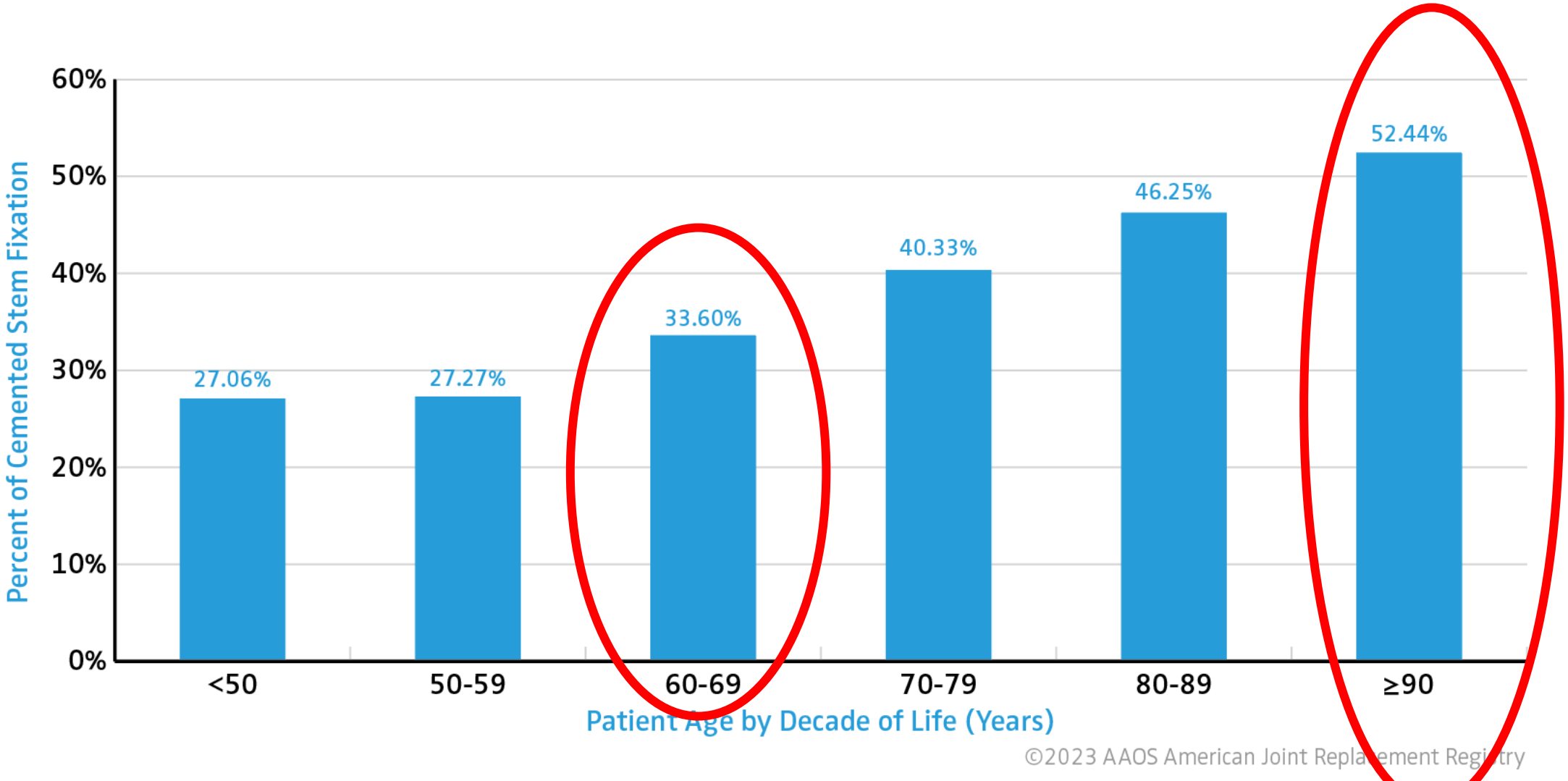
Current State

Percent of Cemented Stem Fixation Used in Hemiarthroplasty for Femoral Neck Fracture by Age Group, 2012-2022 (N=39,898)



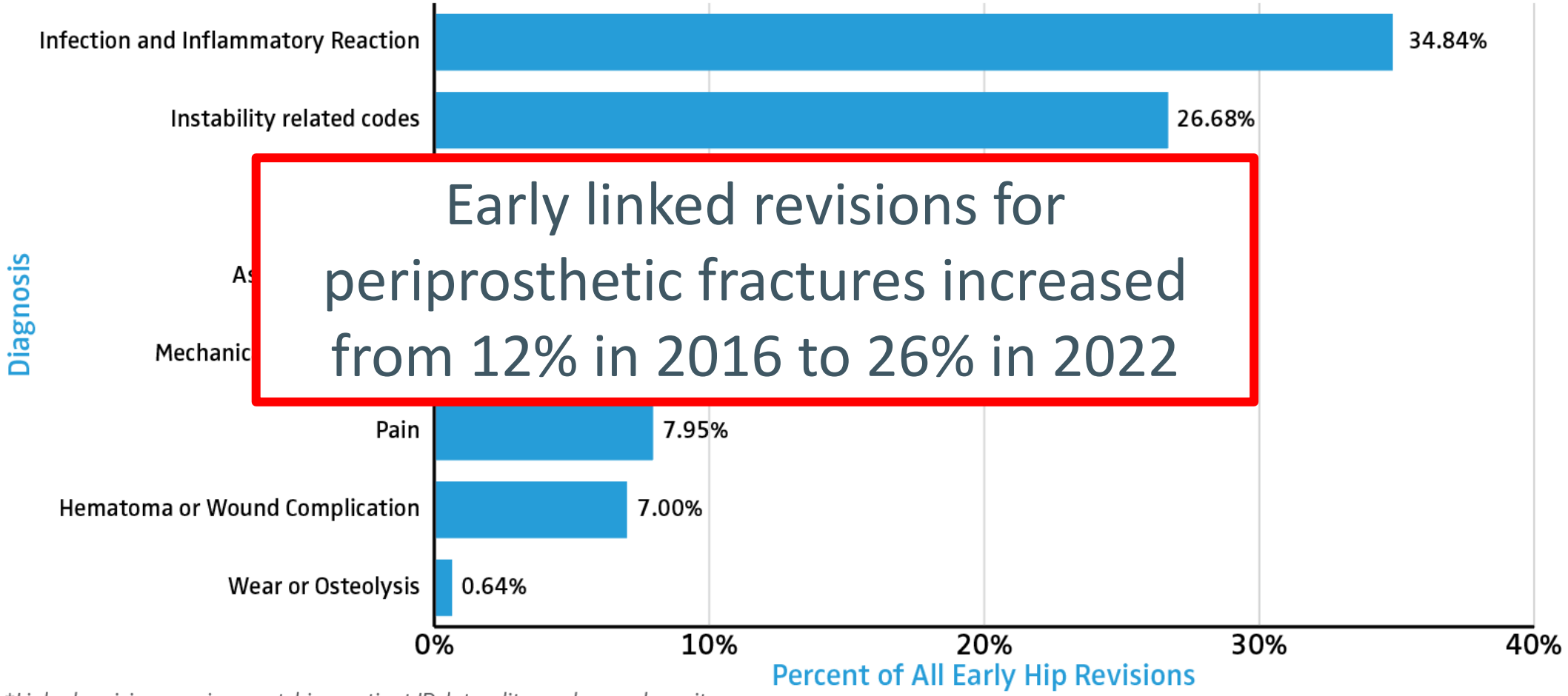
Barriers to Cement Use

- Outcomes
- Cementation Syndrome/Mortality
- Familiarity
- Time

Advantages of Cement

- Fracture patients already have inherently poor bone quality
- Undersized *cementless* stems can lead to subsidence, fibrous fixation increasing risk of loosening or fracture.
- Baseline high mortality rate

Early “Linked” Hip Revisions, 2012-2022 (N=9,696)*



Early linked revisions for periprosthetic fractures increased from 12% in 2016 to 26% in 2022

*Linked revision requires matching patient ID, laterality, and procedure site

Worldwide Data supports cemented femoral fixation

- Data is overwhelming in favor for cemented fixation in non-US national joint registries

- Epidemiology of periprosthetic fracture of the femur in 32 644 primary total hip arthroplasties (Abdel BJJ 2016)
  - Cemented vs Uncemented fixations
  - **Intraop fractures 0.23% vs 1.7%**
  - Post op 2.1% vs 7.7% (20-year probability)
  - **Females over 65 at highest risk**

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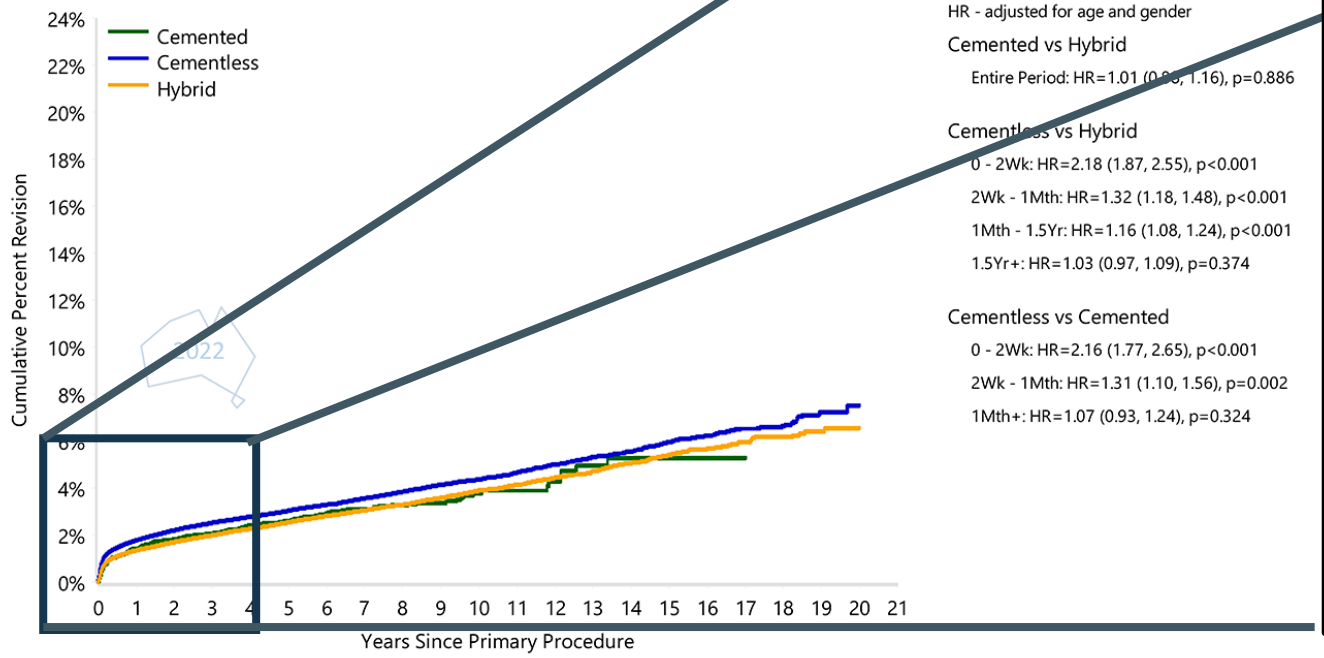
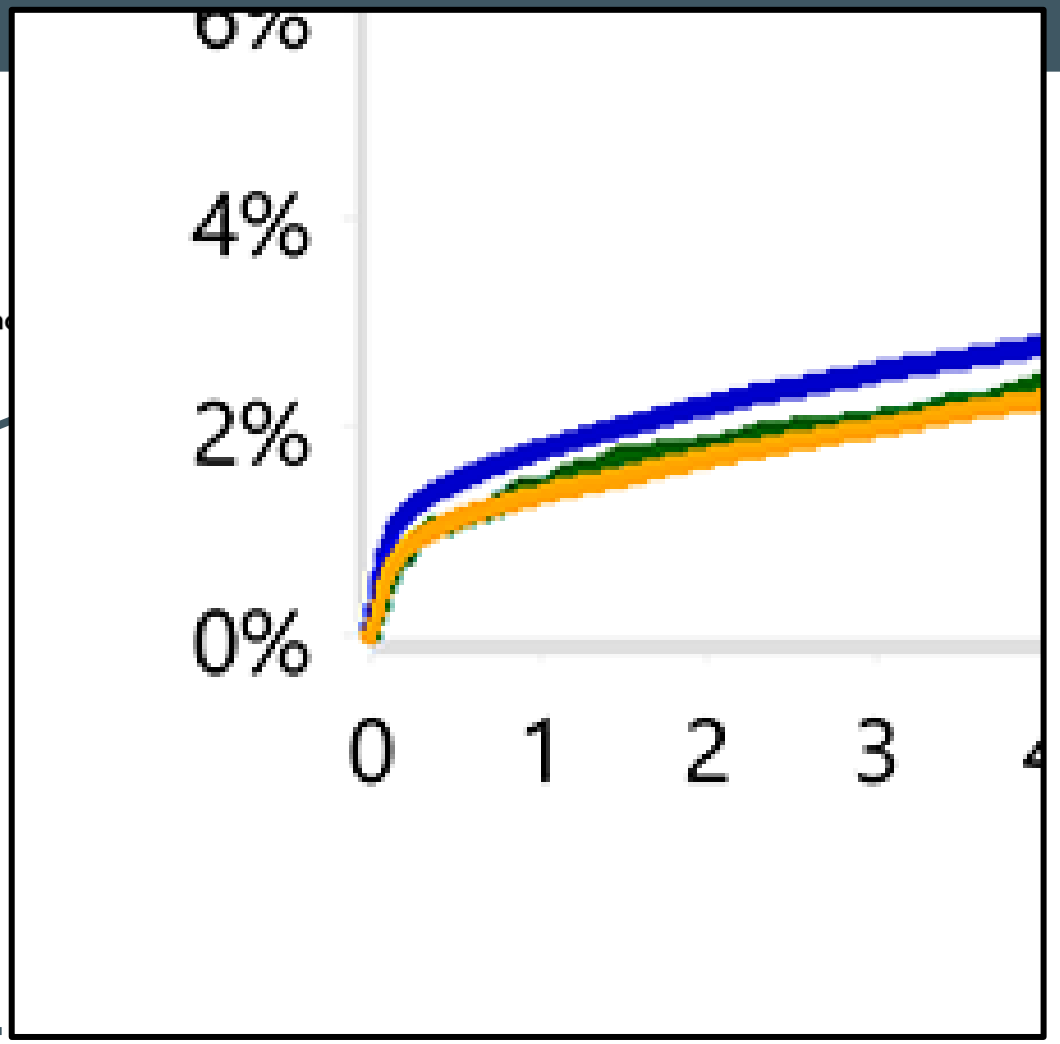
Australian registry

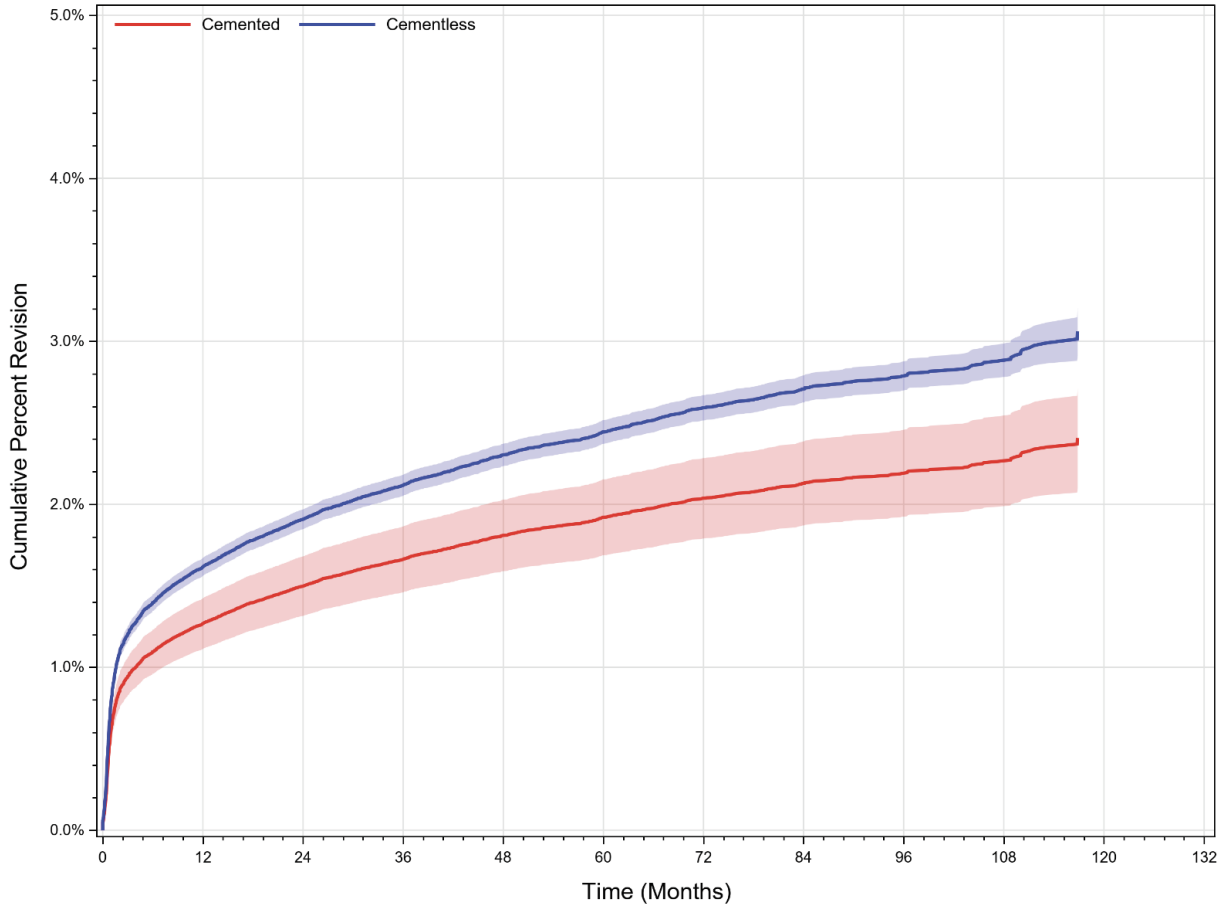
Figure HT29 Cumulative Percent Revision of Primary Total Conventional Hip Replacement by Fixation (Prim… Diagnosis OA)





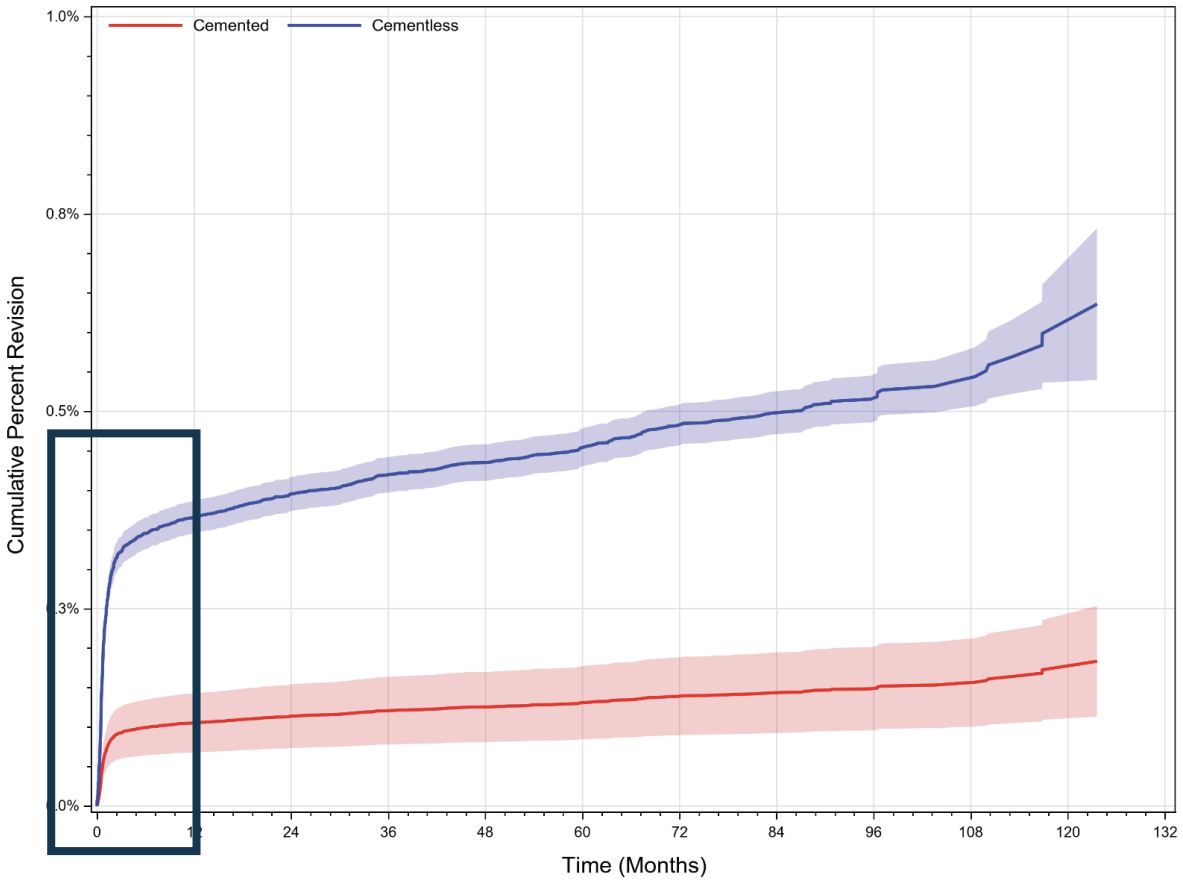
Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	15 Yrs	20 Yrs
Cemented	7346	6683	5365	4063	960	184	0
Cementless	220214	192608	146865	104450	34489	7025	198
Hybrid	133701	118723	92380	68795	25731	6165	224

Cumulative Percent Revision for Femoral Stem Fixation Used for Elective Primary Total Hip Arthroplasty for Female Medicare Patients 65 Years of Age and Older with Primary Osteoarthritis, 2012-2022



Number at Risk (Months)	0	12	24	36	48	60	72	84	96	108	120	132
Cemented	14,539	12,730	10,717	9,049	7,147	5,341	3,640	2,163	1,097	429	159	1
Cementless	201,804	180,696	159,896	139,183	112,921	86,091	58,974	35,709	19,845	8,683	2,536	10
Total	216,343	193,426	170,613	148,232	120,068	91,432	62,614	37,872	20,942	9,112	2,695	11

Age adjusted HR (95%CI), p-value
Cemented vs. Cementless: 0.783(0.684,0.896) p=0.0004



Number at Risk (Months)	0	12	24	36	48	60	72	84	96	108	120	132
Cemented	17,899	15,682	13,201	11,142	8,824	6,633	4,553	2,686	1,349	525	189	1
Cementless	338,998	303,809	268,526	233,303	189,380	144,520	98,593	59,730	33,066	14,391	4,240	13
Total	356,897	319,491	281,727	244,445	198,204	151,153	103,146	62,416	34,415	14,916	4,429	14

Age/Sex adjusted cause-specific HR (95%CI), p-value
Cemented vs. Cementless: 0.287(0.192,0.43), p=<0.0001

Cumulative Percent Revision due to Periprosthetic Fracture for **Elective** Primary Total Hip Arthroplasty Patients 65 Years of Age and Older, 2012-2022

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Cemented or Uncemented Hemiarthroplasty for Intracapsular Hip Fracture

Miguel A. Fernandez, Ph.D., Juul Achten, Ph.D., Nicholas Parsons, Ph.D., Xavier L. Griffin, Ph.D., May-Ee Png, Ph.D., Jenny Gould, Alwin McGibbon, B.A., and Matthew L. Costa, Ph.D., for the WHiTE 5 Investigators*

CONCLUSIONS

Among patients 60 years of age or older with an intracapsular hip fracture, cemented hemiarthroplasty resulted in a modestly but significantly better quality of life and a lower risk of periprosthetic fracture than uncemented hemiarthroplasty.
(Funded by the National Institute for Health Research; WHiTE 5 ISRCTN number, ISRCTN18393176.)

Table 3. Complications Reported during 12 Months of Follow-up.

Complication	Cemented Hemiarthroplasty (N=610)	Uncemented Hemiarthroplasty (N=615)	Odds Ratio, Uncemented vs. Cemented (95% CI)*
	number (percent)		
Routinely reported complications			
Dislocation	5 (0.8)	5 (0.8)	—
Neurologic injury	3 (0.5)	1 (0.2)	—
Vascular injury	1 (0.2)	0	—
Tendon injury	0	2 (0.3)	—
Deep-vein thrombosis	8 (1.3)	6 (1.0)	0.74 (0.21–2.45)
Erythema	30 (4.9)	20 (3.3)	0.65 (0.35–1.20)
Dehiscence	6 (1.0)	4 (0.7)	0.66 (0.14–2.80)
Other	92 (15.1)	102 (16.6)	1.12 (0.81–1.54)
Any	129 (21.1)	130 (21.1)	1.00 (0.75–1.33)
Additional complications			
Wound infection	13 (2.1)	8 (1.3)	0.61 (0.22–1.59)
Venous thromboembolism	1 (0.2)	2 (0.3)	—
Pneumonia	2 (0.3)	1 (0.2)	—
Urinary tract infection	39 (6.4)	52 (8.5)	1.35 (0.86–2.14)
Stroke	6 (1.0)	5 (0.8)	0.83 (0.20–3.26)
Myocardial infarction	4 (0.7)	4 (0.7)	0.99 (0.18–5.35)
Blood transfusion	31 (5.1)	31 (5.0)	0.99 (0.58–1.71)
Chest infection	41 (6.7)	40 (6.5)	0.97 (0.60–1.56)
Acute kidney injury	28 (4.6)	22 (3.6)	0.77 (0.42–1.42)
Pulmonary embolism	5 (0.8)	2 (0.3)	—
Periprosthetic fracture	3 (0.5)	13 (2.1)	4.37 (1.19–24.00)
Failure of fixation	1 (0.2)	1 (0.2)	—
Additional hip surgery	10 (1.6)	12 (2.0)	1.19 (0.47–3.11)
Other	4 (0.7)	7 (1.1)	1.74 (0.44–8.16)

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Primary Hip

Total Hip Arthroplasty for Femoral Neck Fracture: What Are the Contemporary Reasons for Failure?

Elizabeth B. Gausden, MD, MPH, William W. Cross III, MD, Tad M. Mabry, MD, Mark W. Pagnano, MD, Daniel J. Berry, MD, Matthew P. Abdel, MD *

Department of Orthopedic Surgery, Mayo Clinic, Rochester, MN

- 8% revisions at 2 years
- Most common periprosthetic fractures (equal cemented and uncemented)
- 2nd most common: aseptic loosening.

Femoral neck fracture vs Periprosthetic femur fracture **mortality**

Boyland et al JBJS 2018

- 4.6% vs 3.2 % at 1 month
- 15.9% vs 9.7% at 1 year.

E.B. Gausden et al. / The Journal of Arthroplasty 36 (2021) S272eS276

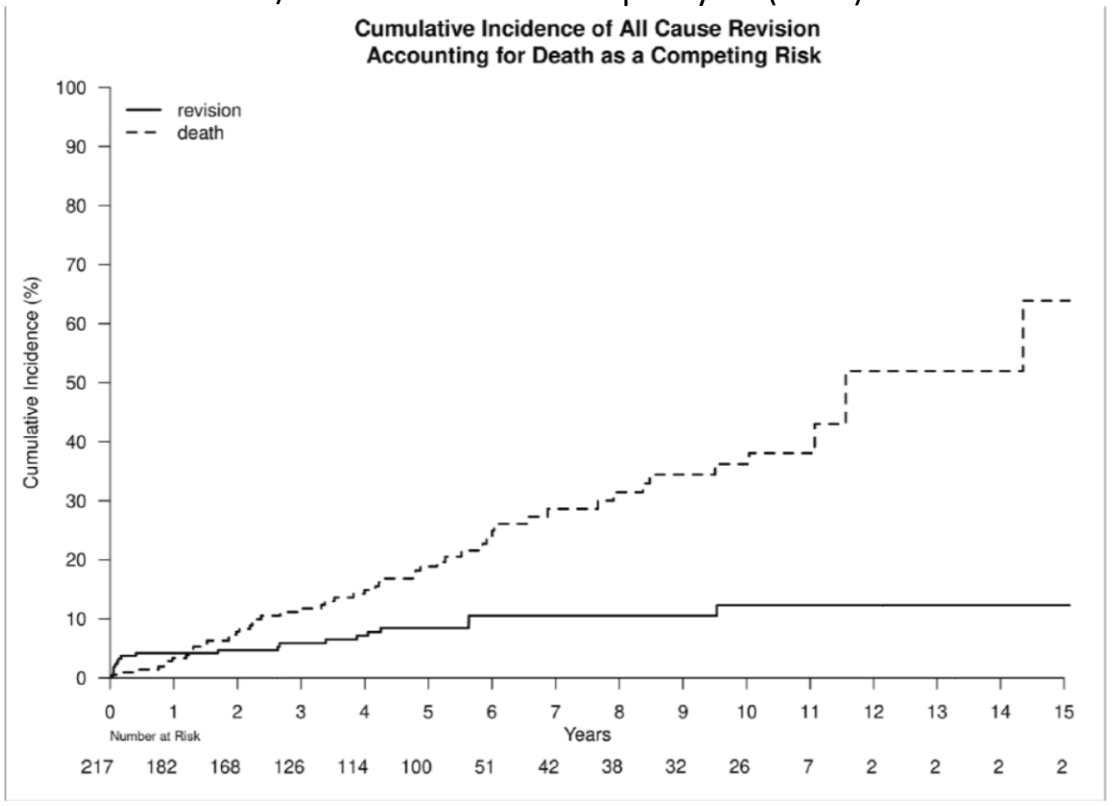
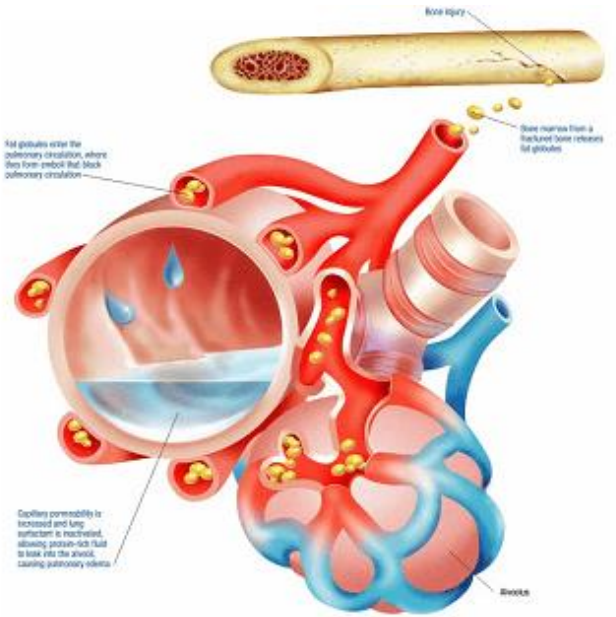


Fig. 1. Graph depicting the cumulative incidence of all-cause revision accounting for death as a competing risk.

Cement Implantation Syndrome

- Incidence of Bone Cement Implantation syndrome can vary in the literature but occurs between 25-30% with varying degrees of severity
  - Clin Orthop Relat Res (2021) 479:755-763
  - Cureus . 2022 Nov 26;14(11):e31908.



- Combination of veno-dialation and fat embolization can lead to transient right heart failure.

- Cement Implantation syndrome - incidence is high but **mortality is low** (0.01%-0. 71%)

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Systematic Review and Meta-Analysis

Perioperative Mortality After Cemented or Uncemented Hemiarthroplasty for Displaced Femoral Neck Fractures—A Systematic Review and Meta-analysis

Christopher Fenelon, MCh, MRCSI [a, *], Evelyn P. Murphy, MCh, MRCSI [a], Eoghan Pomeroy, MCh, FRCSI [a], Robert P. Murphy, MSc, MRCPI [b], William Curtin, FRCSI [c], Colin G. Murphy, FRCSI [c]

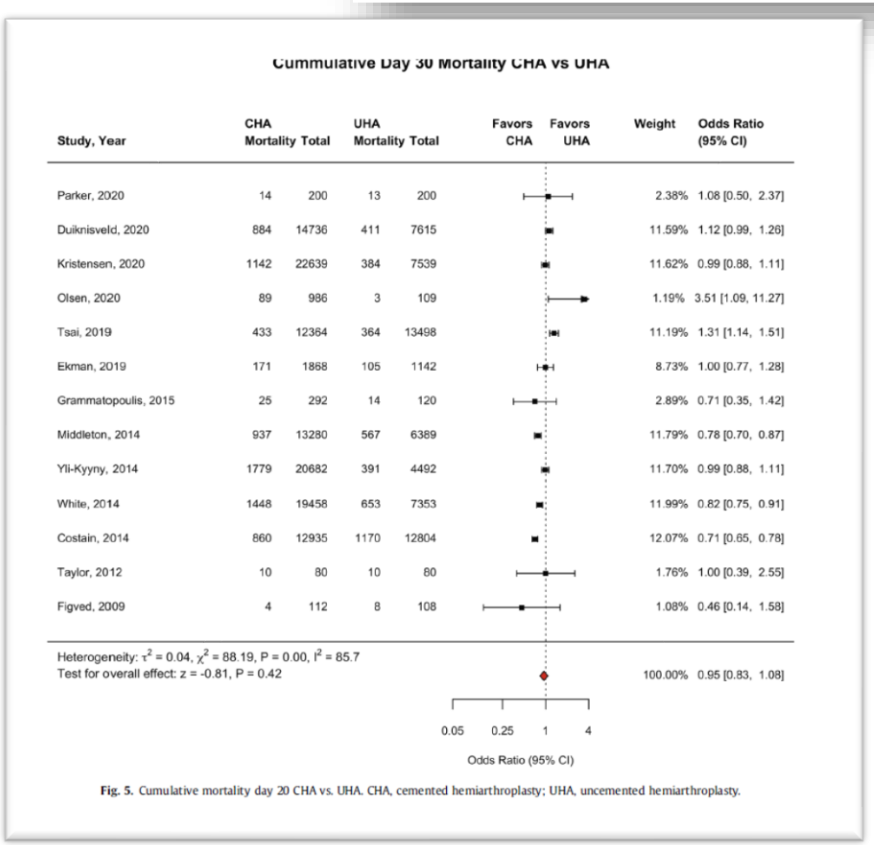

Fig. 5. Cumulative mortality day 20 CHA vs. UHA. CHA, cemented hemiarthroplasty; UHA, uncemented hemiarthroplasty.

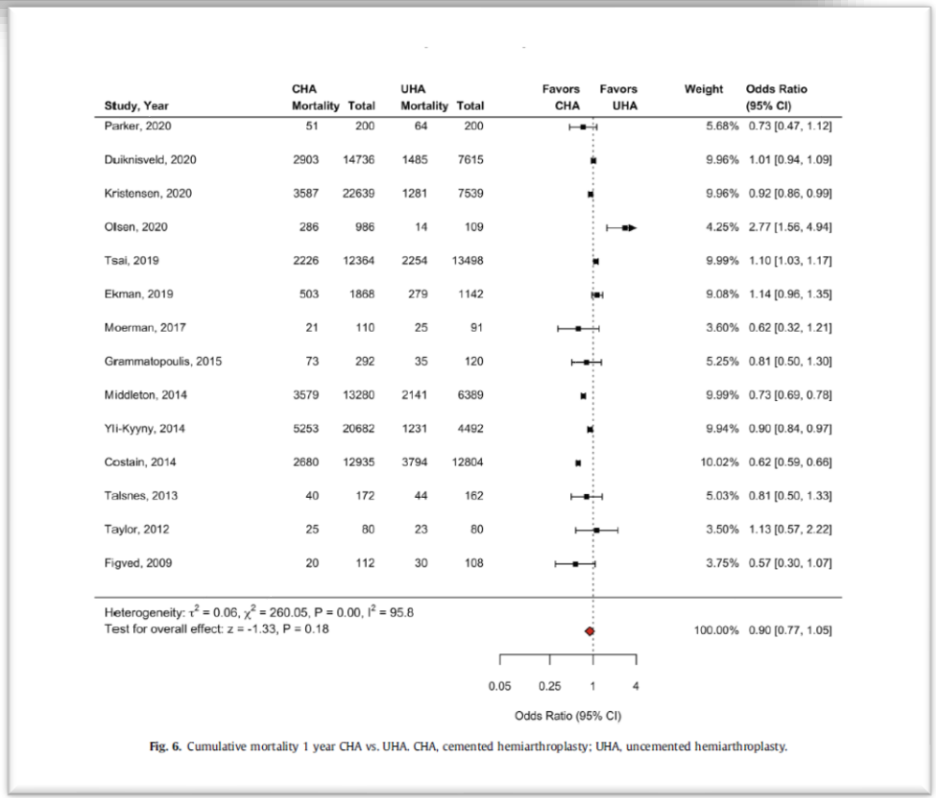

Fig. 6. Cumulative mortality 1 year CHA vs. UHA. CHA, cemented hemiarthroplasty; UHA, uncemented hemiarthroplasty.

C. Fenelon et al. / The Journal of Arthroplasty 36 (2021) 777e787

Familiarity

- Less exposure and concerns for BCIS has increased anxiety about cementation
- Residents are training less on cement

Proceedings of The Hip Society 2021

Are We Training Surgeons to Cement a Femoral Component in Hip Arthroplasty? The Trainees' Perspective

J. Conner Ryan, MD [a], Ian M. Duensing, MD [a], Wendy M. Novicoff, PhD [a], James A. Browne, MD [a, *]

[a] *Department of Orthopaedic Surgery, University of Virginia, Charlottesville, Virginia*

37% training "Comprehensive/very comprehensive"
17% training "inadequate or nonexistent"

Conclusions: one question

- Compared to cementless implants, Cemented implants for FN fractures have:
  a) minimal additional risk of mortality
  b) Significantly decreased risk of periprosthetic fracture
  c) Improved quality of Life
  d) All the above

So why don't you don't you cement already!?

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