

# Uncemented Total Hip Arthroplasty Can Be Used Safely in the Elderly Population

Jacob Feathers<sup>1</sup>, Peter Lewis<sup>2</sup>, Faiz Khan<sup>2</sup>, Michael Lewis<sup>3</sup>, Keith Morris<sup>4</sup>, James Waddell<sup>5</sup>

1. Leeds Teaching Hospitals Trust, 2. Cwm Taf Health Board, 3. University of South Wales, 4. Cardiff Metropolitan University, 5. St Michael's Hospital, Toronto



## Introduction

Since the publication of 'Getting it Right First Time' (GIRFT) directives in 2015, there has been significant pressure on surgeons to use cemented hip implants in patients aged over 65 undergoing total hip arthroplasty (THA). This has since been raised to 70, stating that they 'could not justify the increased prostheses cost in terms of outcome in this age group'. NHS England Best Practice Tariffs (BPT), now require 80% of total hip replacements to be cemented or hybrid in patients aged over 70. There are financial penalties if this is not observed.

The aim of our study was to document a large number of patients undergoing elective cementless THAs across all ages. We then compared those aged over 65 years with those under (GIRFT recommendation), and then another comparison for those aged 70 and over, against their younger counterparts (BPT and GIRFT). We used our results to specifically discuss GIRFT recommendations and to fulfil their requests for more detailed information to support or refute a policy of cemented fixation in the elderly.

## Methods

We utilised a prospectively collected single surgeon database. Individual records were anonymized prior to analysis. There was 1,091 primary THA constructs involved in the study, with ages ranging from 23 to 93 years old and patients of all frailty. After exclusion criteria were applied, 1,004 hips were analysed for this study. The cementless system used was Corail/Pinnacle (DePuy Synthes, USA). We measured functional outcome utilising patient reported outcomes, Oxford Hip Score (OHS). OHS was collected immediately preoperatively and postoperatively at six weeks, 4.5 months, one year and 2 years. Further analysis was undertaken to analyse those achieving minimal important change (MIC), signifying an improvement of 8 or above in OHS at each follow up interval.

## Discussion

We find that those aged below 65 or 70 do not have a better functional outcome compared to their older counterparts following cementless THA. A significantly greater proportion of patients aged over 65 and 70 reached MIC at six weeks ( $p = 0.012$  and  $p = 0.010$ , respectively) compared to their younger cohorts (noted again for the  $> 65$  group at 4.5 months ( $p = 0.032$ )). This advantage was lost as the younger groups progressed through time. This conflicts with the findings of GIRFT, who state that the use of uncemented prostheses in the elderly could not be justified in terms of outcome and cost.

Our overall construct survival in this THA system was 98.7%, with mean follow up over 5 years. Our revision rate was 1.3% better than commonly used cemented constructs in the NJR. Revision for any reason was performed in 13/1004 hips. According to the NICE classification, 7/13 were defined as prosthesis independent and was related to delayed wound closure or suspected infection. A frequently discussed concern is the risk of peri- or post-operative fracture. Therefore, these findings do not support either GIRFT or BPT recommendations to avoid this uncemented system for concerns of implant safety or increased revision rates in the elderly.

A major driving factor behind GIRFT and BPT recommendations is the cost associated with cementless systems. Although we have not formally analysed cost, we have found that patient outcomes in the elderly are as good, if not better than younger counterparts. Revision burden following surgery was low. GIRFT acknowledge also that cementless systems require 24 minutes less operating time per case. This is an important consideration to take into account when analysing cost.

## Results

Average Oxford Hip Score Before and Following Uncemented Total Hip Replacements in Patients Aged Above or Below 65 and 70.

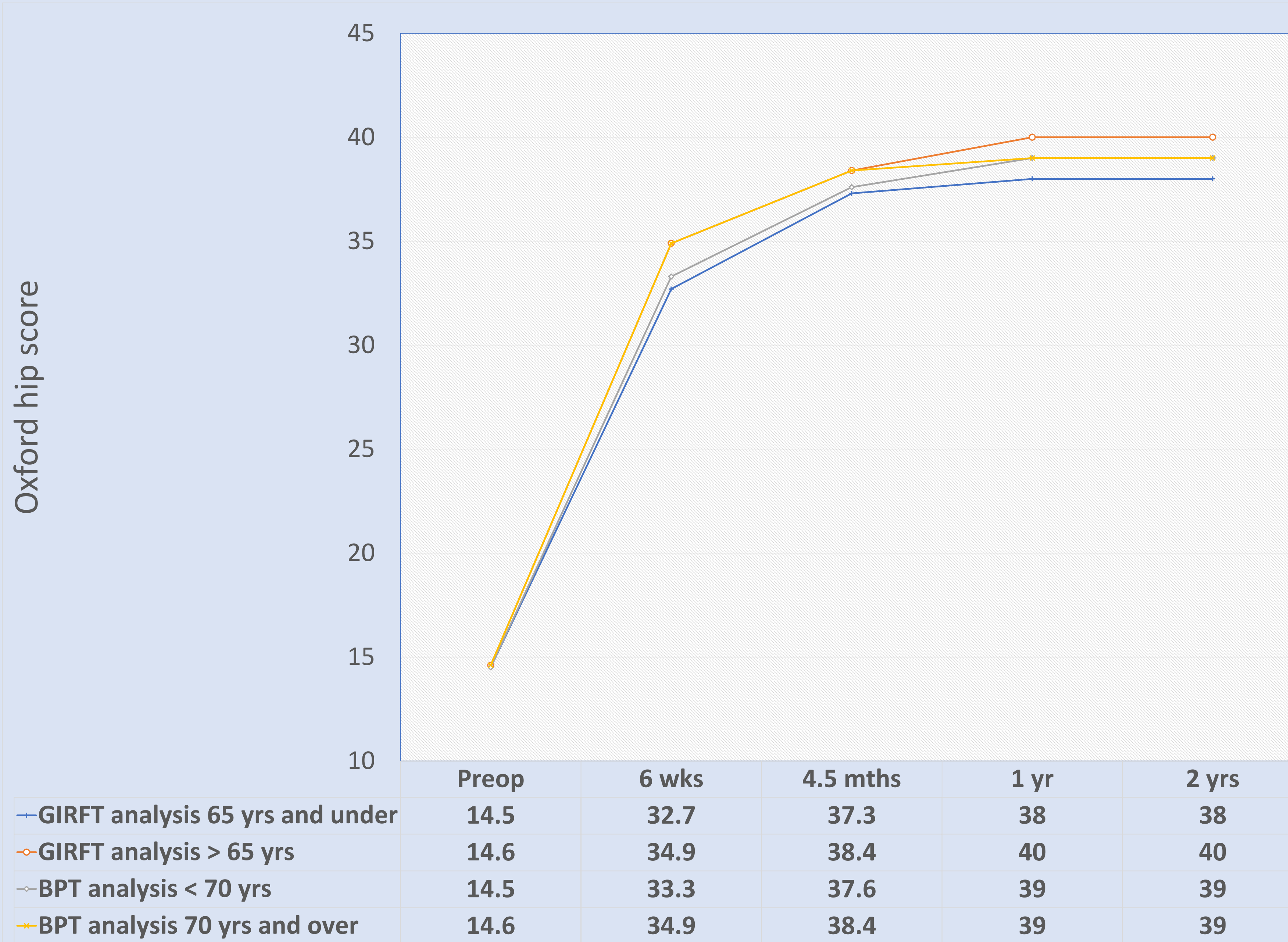


Figure 1. This graph shows the average trend of oxford hip score following cementless THA.

Timepoint	n	Achieving MIC ( $\geq 8$ )		p-value	
Preop	1,004				
6 wks	941	833 (88.5)			
4.5 mths	839	783 (93.3)			
1 yr	745	702 (94.2)			
		$\leq 65$	$> 65$		
Preop	430	574			
6 wks	401	540	341 (85.0)	492 (91.1)	0.012
4.5 mths	356	483	324 (91.0)	459 (95.0)	0.032
1 yr	320	425	300 (93.8)	402 (94.5)	0.897
		$< 70$	$\geq 70$		
Preop	597	407			
6 wks	559	382	483 (86.4)	350 (91.6)	0.01
4.5 mths	501	338	461 (92.0)	322 (95.3)	0.09
1 yr	456	289	428 (93.8)	274 (94.8)	0.431

Table 1. Minimal important change in Oxford Hip Score between all age groups at the different time frames. P-value is added as a comparison between the groups.

The average trend in OHS across all age groups is detailed in figure 1. The MIC trends across all age groups is shown in table 1. 1.1% of patients aged under 65 required revision surgery compared to 2.3% of patients aged over 65. 1.4% of patients aged under 70 required revision surgery, compared to 2.5% in those above. The most common reason for revision surgery was debridement, antibiotics and implant retention (DAIR). Patients aged under 65 had a 1.4% chance of experiencing a fracture or dislocation following surgery, compared to 2.5% of patients above 65. This again was consistent with a higher cut off, 2.0% of under 70 year olds experienced a fracture or dislocation, in comparison to 2.2% in those aged over 70. There was only 1 recorded mortality across the 819 patients involved in this study, a patient aged over 70.

## Conclusion

Uncemented THRs are an extremely safe and efficacious procedure across all age groups. There was no link between functional hip outcome and age following surgery, conflicting with GIRFT recommendations. Surgery was generally well tolerated amongst all age groups highlighting the safety of this procedure. The extra duration of cemented surgery may equilibrate the financial disparity between uncemented and cemented prostheses. It may also impact post-operative recovery and subsequent surgical success rates. More research into this area is required to decipher the optimal technique in the practice of THAs.