INTRODUCTION:
Both cemented and uncemented fixation of primary total hip replacement (THR) are now common practice. Despite this, debate continues regarding the relative merits of each method of fixation. As identified in a recent systematic review and meta-analysis, there is a paucity of randomised controlled trials (RCT) comparing fixation. This paper presents the long-term pain and function, implant survival to revision, and potential for failure due to loosening and osteolysis of cemented and uncemented primary THR from a RCT established in 1984 to examine the hypothesis that there are no important differences in pain and function at 2 years between cemented and uncemented THR in middle-aged patients.

METHODS:
From a consecutive series of primary THRs performed by two surgeons between May 1985 and August 1992, 99 hips were randomized to undergo cemented or uncemented THR. To test the primary hypothesis, a minimum of 30 hips per group were required to detect a difference of 20 points in the Harris hip score (effect size 0.66, power 0.8, α = 0.05). After perioperative exclusions and exclusions due to design changes, 41 cemented hips and 43 uncemented hips were included (Table 1).

For cemented THR, an Exeter ultrahigh molecular weight polyethylene acetabular component and a collarless polished double tapered Exeter stainless steel stem were implanted with simplex surgical cement. For uncemented THR, a PCA circumferentially proximal 1/3 porous coated cobaltchrome modular stem and a PCA cobaltchrome porous coated hemispherical acetabular component were press-fit with no supplementary screw fixation. A posterior approach and second generation cementing techniques were used. Uncemented stem trial fit was confirmed by intraoperative x-rays. Patients mobilised within 2 days of surgery with weight-bearing as tolerated.

The Harris hip score (hip pain, function), reoperations, radiographic loosening and osteolysis were determined at regular follow-up. The Mann Whitney U test was used to compare Harris hip scores at 2 years. Longitudinal repeated measures multivariate analysis was used to compare Harris hip and pain scores over the review period. Kaplan-Meier survival analyses were performed using revision endpoints.

RESULTS:
Hypothesis test: The median Harris hip score at 2 years was 91 (25th - 75thiles 80-100) in the cemented THR group and 94 (88-100) in the uncemented THR group (Fig 1). There was no difference in the Harris hip score between cemented and uncemented THR at 2 years (p = 0.119).

DISCUSSION:
This is one of the few RCTs of cemented and uncemented fixation providing data for a debate that continues regarding optimal fixation of primary THR. Fixation did not influence hip pain and function at 2 years or over the long-term duration of this study. The polished double taper stem and the PCA circumferentially porous coated uncemented stem were unremarkable with no failures for loosening and no radiographically determined pending failure. Radiographic demarcation and osteolysis were common around cemented and uncemented acetabular components respectively, which may bring these components to revision if patients live long enough. There were problems with the trial design which have been appreciated over the last decades. These included being a single centre rather than a multicentre study and therefore very slow recruitment, inadequate numbers to test other important hypotheses, design changes leading to heterogeneity of components being tested, different femoral head sizes and different polyethylene. Importantly, the results suggest that three decades of trial design which have been appreciated over the last decades. These included being a single centre rather than a multicentre study and therefore very slow recruitment, inadequate numbers to test other important hypotheses, design changes leading to heterogeneity of components being tested, different femoral head sizes and different polyethylene. Importantly, the results suggest that three decades of...