

Current Causes of Hip Revision in the United States: Data from the American Joint Replacement Registry (AJRR)

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Introduction

- The American Joint Replacement Registry (AJRR) is a not-for-profit 501(c)(3) tax-exempt organization for data collection and quality-improvement initiatives for total hip and knee replacements.
 - The AJRR is a collaborative effort supported by the American Academy of Orthopaedic Surgeons (AAOS), the American Association of Hip and Knee Surgeons (AAHKS), The Hip Society, The Knee Society, hospitals, health plans, medical device manufacturers, and contributions from individual orthopaedic surgeons.
 - AJRR's goal is to capture 90% of all total joint replacement procedures in the U.S.
- Understanding causes of revision following total hip arthroplasty (THA) and changing practice patterns can provide insights for reducing revision burden.
- As the U.S. National Arthroplasty Registry, AJRR provides a robust dataset to analyze revision metrics in the United States.

Goal

To examine the main causes of hip revision surgery and selected revision practices in the management of dislocation and infection within a national Registry dataset.

Materials and Methods

Data Collection:

- AJRR participating hospitals submitted THA data electronically via a file upload to AJRR's secure SFTP site.

Data Elements:

- ICD-9 diagnosis codes
- ICD-9 procedural codes
- Implant manufacturer name
- Implant catalog number

Analysis:

- Study sample: 2014 THA procedures (primary and revisions) based on ICD-9 hip procedural codes from Registry.
- Hip revision defined by ICD-9 codes:
 - 00.70 – Revision of hip replacement, both acetabular and femoral components
 - 00.71 – Revision of hip replacement, acetabular component
 - 00.72 – Revision of hip replacement, femoral component
 - 00.73 – Revision of hip replacement, acetabular liner and/or femoral head only
 - 00.74 – Hip-bearing surface, metal-on-polyethylene
 - 81.53 – Revision of hip replacement, not otherwise specified
- Revision burden** defined as:
 - The number of arthroplasties performed in 2014 compared to the total number of arthroplasties performed in 2014.
- Identified causes of revisions based on submitted ICD-9 diagnosis codes for each revision.
- Based on implant data (manufacturer name and catalog number), assessed revision practices in the management of selected complications with primary implant.

Results

2014 Hip Revision Metrics:

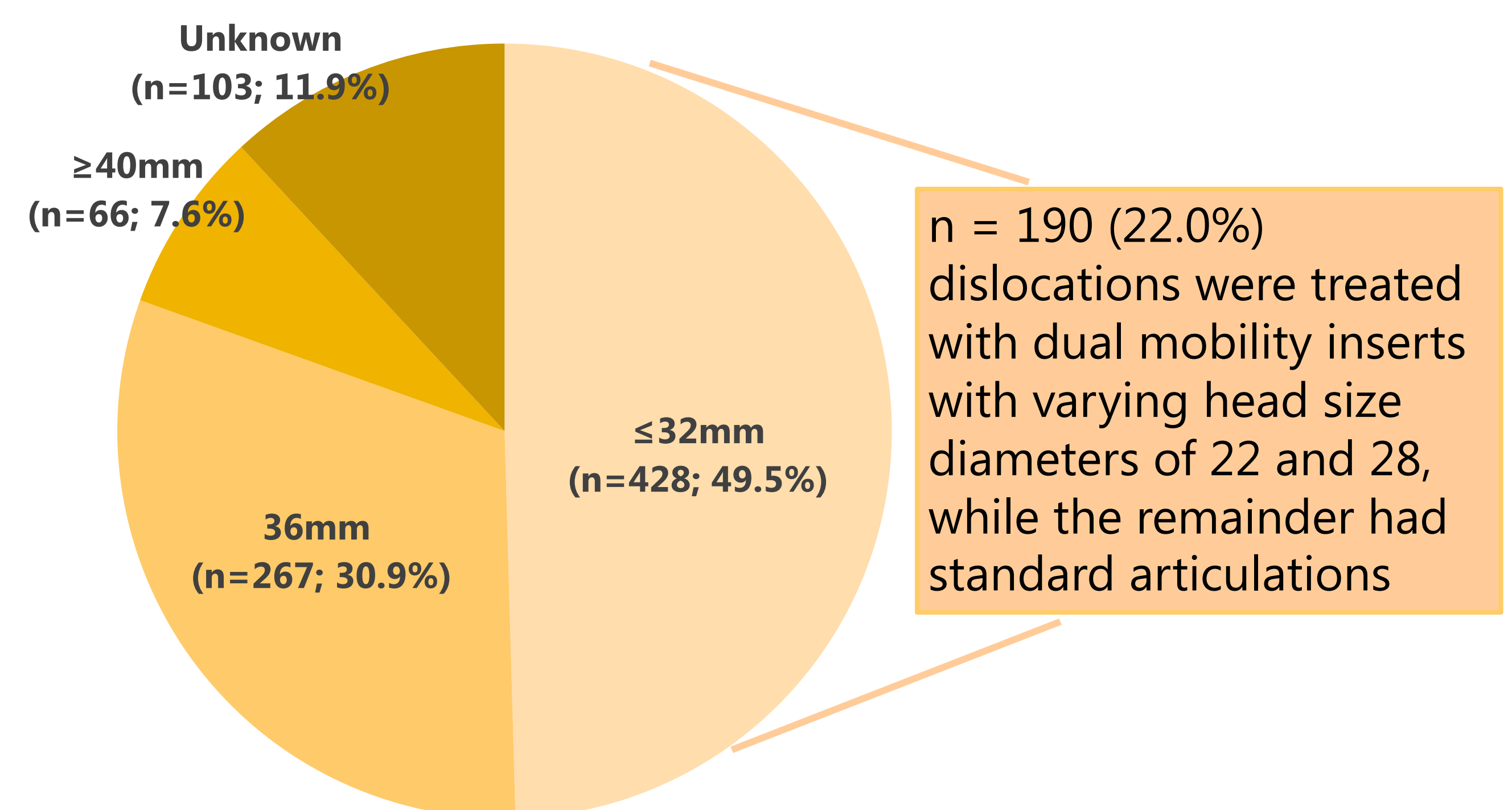
- Total of THA procedures; N = 59,148
- Total of revision THA; n = 5,805
- Revision burden = 9.8%
- Reporting hospitals; n = 292 (across all 50 states)
 - Revisions were conducted at n = 242 (82.9%) reporting hospitals

Leading diagnoses for hip revisions (n=5,805)

Diagnosis	Number of Cases (%)
Mechanical Complication	937 (16.1%)
Dislocation	864 (14.9%)
Mechanical Loosening	845 (14.6%)
Infection	469 (8.1%)

The remaining diagnosis codes reported (46.3%) included: Other complications, articular bearing surface wear, periprosthetic fracture, osteoarthritis, invalid diagnosis code, periprosthetic osteolysis, and pain in joint.

Implant Usage for Dislocation (n=864):



Implant Usage for Infection (n=469):

- n = 148 (31.6%) involved only head and liner exchanges

Discussion

Revision surgeries occurring in a particular year include both short-term failure of recent procedures and longer term failures of implants inserted many years or decades earlier. Thus, revision burden reflects not only more recent implant design and surgical practices but techniques and devices from an earlier era which may or may not perform differently than those which are more current. Despite this, these data may be used to identify highest priority targets for current practice and implant improvement.