ANALYSIS OF DEPUY CMW® 1 GENTAMICIN AND DEPUY CMW 2 GENTAMICIN BONE CEMENTS IN TOTAL HIP ARTHROPLASTY IN THE NATIONAL JOINT REGISTRY FOR ENGLAND, WALES AND NORTHERN IRELAND

Introduction
National joint registries provide valuable generalizable information on the revision rates and survivorship of orthopaedic implants. Typically they include large cohorts with data from all surgeons and centres, irrespective of surgeon experience level. The National Joint Registry for England, Wales and Northern Ireland (NJR) has been in operation since 2003 and in that time has collected data on almost 620,400 total hip replacements (of which 228,196 (36.8%) procedures were cemented)¹.

In addition to the publicly available NJR reports, data is also available from a supplier feedback dataset, downloaded by DePuy Synthes from the NJR on March 10, 2015.² This additional information provides detailed data on DePuy CMW cements and is the focus of this commentary.

DePuy CMW 1 Gentamicin and DePuy CMW 2 Gentamicin are self-curing, radiopaque, polymethyl methacrylate based cements, containing antibiotic, used for securing a metal or polyethylene prosthesis to living bone in arthroplasty procedures. Both cements have a long history of use in hip replacement procedures.³,⁴

DePuy CMW 1 Gentamicin is a high viscosity cement intended for either digital or syringe application, and is commonly used in the femoral part of total hip arthroplasty (THA). DePuy CMW 2 Gentamicin is a fast setting cement designed for digital application to small joints and the hip acetabulum.

Analysis population
In total the dataset records 13,305 cases in which a primary THA procedure was performed with a DePuy Synthes cup and stem used in combination with either DePuy CMW 1 Gentamicin or DePuy CMW 2 Gentamicin bone cement. ASR implants were excluded from the analysis, as the implant was voluntarily recalled in 2010. For DePuy CMW 1 Gentamicin, 7,132 procedures were analyzed, while for DePuy CMW 2 Gentamicin, the data provides information on 6,173 total hips (Table 1).

### Analysis population for primary total hip arthroplasty

<table>
<thead>
<tr>
<th>Antibiotic Cement Type</th>
<th>THA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DePuy CMW 1 Gentamicin</td>
<td>7,132</td>
</tr>
<tr>
<td>DePuy CMW 2 Gentamicin</td>
<td>6,173</td>
</tr>
<tr>
<td>Total</td>
<td>13,305</td>
</tr>
</tbody>
</table>

Table 1. Analysis population for primary total hip arthroplasty

#### Results:
Kaplan-Meier (KM) survivorship analyses were conducted with an endpoint of revision for any reason. Estimates are shown together with 95% Confidence Intervals (95% CI). Calculations were performed if there were a minimum of 40 cases at risk.⁵

Within the DePuy CMW 1 Gentamicin dataset, 100 revisions were recorded from 7,132 cases within 10 years. The Kaplan-Meier survivorship was calculated to be 98.6% (95% CI 98.2 - 98.9%) at 5 years and 96.3% (95% CI 95.3 - 97.1%) at 10 years. For CMW 2 Gentamicin, there were 76 revisions recorded from 6,173 cases at 10 years, with corresponding 5 and 10 year survivorships of 98.6%, (95% CI 98.2 - 98.9%) and 97.3% (95% CI 96.5 - 98.0%), respectively (Table 2).

### Survival of DePuy CMW 1 Gentamicin and DePuy CMW 2 Gentamicin cements used in combination with DePuy Synthes implants in primary total hip arthroplasty, compared to the survivorship of the class of all-cemented THA procedures registered in the UK NJR.¹ CI: confidence interval.

<table>
<thead>
<tr>
<th>Primary Procedure</th>
<th>5 Year Survival (95% CI)</th>
<th>10 Year Survival (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DePuy CMW 1 Gentamicin (N = 7,132)</td>
<td>98.6% (98.2 - 98.9%)</td>
<td>96.3% (95.3 - 97.1%)</td>
</tr>
<tr>
<td>DePuy CMW 2 Gentamicin (N = 6,173)</td>
<td>98.6% (98.2 - 98.9%)</td>
<td>97.3% (96.5 - 98.0%)</td>
</tr>
<tr>
<td>All cemented hip procedures (N = 228,196)</td>
<td>98.5% (98.4 - 98.5%)</td>
<td>96.8% (96.6 - 97.0%)</td>
</tr>
</tbody>
</table>

Table 2. Survival of DePuy CMW 1 Gentamicin and DePuy CMW 2 Gentamicin cements used in combination with DePuy Synthes implants in primary total hip arthroplasty, compared to the survivorship of the class of all-cemented THA procedures registered in the UK NJR.¹ CI: confidence interval.
Summary and conclusion

Long-term survivorship of DePuy Synthes total hip implants combined with DePuy CMW Gentamicin bone cements documented in the NJR were high. Overall, around 96% of the hip procedures were revision-free out to 10 years follow-up. Additionally, the results presented here are comparable to the ones reported for the class of all-cemented procedures in the NJR, for which a reported Kaplan-Meier survivorship estimate of 96.8% (95% CI 96.6 - 97.0%) at 10 years was published (Table 2). Likewise, other national registries have published long-term 10-year survivorships of cemented primary total hip arthroplasties that support these findings. The Australian Orthopaedic Association National Joint Replacement Registry reported a survivorship of 94.0% (95% CI 93.4 - 94.4%) for procedures performed between 1999 and 2012, the New Zealand Joint Register recently published a 10-year survivorship of 94.2% for procedures registered between 1999 and 2012, and the Swedish Hip Arthroplasty Register stated a 10-year survivorship of 95.3% (95% CI 95.0 - 95.6%) for the timespan between 2001 and 2010. Finally, 10-year survivorships in Denmark and Norway for the period 1995 to 2006 were reported by the Nordic Arthroplasty Register Association as 92.9% (95% CI 92.4 – 93.4%) and 93.5% (95% CI 93.2 - 93.9%) respectively.

All in all, DePuy CMW 1 Gentamicin and DePuy CMW 2 Gentamicin cements perform well in the long-term follow-up of total hip arthroplasties. Survivorship estimates are comparable to the cemented THA class reported in the 2014 NJR annual report, and are consistent with the cemented THA class survivorship observed in joint registry data available from Australia, New Zealand, Sweden, Denmark and Norway.

References

2. NJR-NJR data from 1st Apr 2003-10th March 2015 on DePuy products supplied for post-marketing surveillance, NJR Centre. Note: NJR-NJR Supplier Feedback data do not include Hospital Episode Statistics (HES) data linkage. Revisions may therefore be underreported.
10. Havelin U et al., The Nordic Arthroplasty Register Association: a unique collaboration between 3 national hip arthroplasty registries with 280,201 THRs, Acta Orthopaedica 2009; 80 (4): 393–401

This publication is not intended for distribution in the USA.