Hip, knee, ankle, elbow and shoulder anatomy and joint replacement procedures

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Hip anatomy

There are two main bones relevant in hip replacement procedures:

- Femur - top of leg (ball)
- Acetabulum - part of the pelvis (socket)

NJR Hip replacement procedures:

- Primary Total Prosthetic Replacement using cement
- Primary Total Prosthetic Replacement not using
- Primary Total Prosthetic Replacement not elsewhere classified (eg hybrid)
- Primary Resurfacing Arthroplasty of joint
Primary Total Prosthetic Replacement

Primary total prosthetic replacement procedures require both the acetabulum and femoral sides of the joint to be replaced.

- A cemented procedure is where the femoral stem and acetabular cup or shell requires cement
- A cementless procedure is where the femoral stem and acetabular cup or shell do not use cement
- A hybrid procedure is where the femoral stem OR the acetabular cup or shell use cement

A primary total prosthetic procedure must have 1 of the acetabular options and one of the femoral options

**Acetabular components options for Total Prosthetic Replacements**

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<th>Monobloc cup</th>
<th>Shell and liner</th>
<th>Resurfacing shell</th>
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<td><img src="image1" alt="Monobloc cup" /></td>
<td><img src="image2" alt="Shell and liner" /></td>
<td><img src="image3" alt="Resurfacing shell" /></td>
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**Femoral component options for Total Prosthetic Replacements**

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<th>Monobloc stem</th>
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Proximal

Distal
Resurfacing procedure

This type of procedure uses a resurfacing shell and a resurfacing head. No femoral stem is used. The patient’s femoral head is trimmed and the thin resurfacing head forms a cover over the femoral head.
Knee anatomy

The femur (bone above the knee) and the tibia (bone below the knee) form the knee joint. A meniscus separates the two bones.

NJR Knee replacement procedures

There are 3 distinct types of knee replacement procedures

- Primary Total Prosthetic Replacement (using cement, not using cement, or hybrid)
- Unicondylar Knee Replacement
- Patello-femoral Knee Replacement
Primary Total Prosthetic Replacement (using cement, not using cement, or hybrid)

This procedure has both condyles on the femur replaced. It is the articulating surface on the femur - tibia that is replaced. The patella may or may not be replaced.

Unicondylar Knee Replacement

Only one condyle is replaced. This is either the lateral (outside of the knee) or medial condyle (inside of the knee). It is the articulating surface on the femur - tibia that is replaced.
Patello-femoral knee replacement

A patello-femoral replacement is where an implant is used to replace the patello-femoral groove and also the patella. The articulating surface that is replaced is therefore between the femur and the patella.
ANKLES

Ankle anatomy

The ankle joint consists of the tibia articulating with the talus.

NJR Ankle replacement procedures

A Total Prosthetic replacement procedure may be cemented, cementless or hybrid and comprises of the tibial and talar articular surfaces being replaced.
Elbow anatomy

Three main bones make up the elbow:

- **Humeral** - upper arm
- **Radius** - outside of forearm
- **Ulna** - inside of forearm

This diagram below shows a right arm - Ulna is on the inside of the joint.

**NJR Elbow replacement procedures**

- Primary Total Prosthetic Replacement
- Primary Radial Head Replacement
- Lateral Resurfacing
Primary Total Prosthetic Replacement

- Ulnar
- Humeral
- (radial may or may not be)

Tornier Latitude with radial head being replaced

Biomet Discovery with no radial head replacement

Primary Radial Head Replacement

Radial only (so it is a hemi-arthroplasty).
Lateral resurfacing

Radial and humeral.
Shoulder anatomy

There are two main bones relevant for shoulder replacement procedures:

- Humeral - top of upper arm
- Glenoid - cup shaped hollow on the top corner of the shoulder blade

NJR Shoulder replacement procedures

- Primary Total Prosthetic Replacement
- Primary Hemi-arthroplasty of joint
- Primary Resurfacing Arthroplasty of joint
- Primary Resurfacing Hemi-arthroplasty of joint
- Primary Reverse Polarity Total Prosthetic Replacement

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Primary Total Prosthetic Replacement

In a standard shoulder replacement there is the humeral stem, humeral head and glenoid component. It looks very similar to a hip replacement.

In our component classification the following implants are defined:

- Stem: Humeral stem
- Humeral component: Uni-polar head or bi-polar head
- Glenoid component: Standard

Primary Hemi-arthroplasty of Joint

This is where a humeral stem and humeral head is used but NO glenoid component.
Primary Resurfacing Arthroplasty of joint

A Humeral resurfacing head and a glenoid component is used.

Primary Resurfacing Hemi-arthroplasty of joint

A Humeral resurfacing head component is used.
Primary Reverse Polarity Total Prosthetic Replacement

A Reverse shoulder replacement is so called because the ‘head’ is connected to the glenoid cavity where as in normal shoulder replacement the ‘head’ is connected to the humeral stem.

The implants are classified on the NJR database as

**Stem:**
Humeral stem

**Humeral components:**
Proximal section (white cup shaped implant in picture below)
Liner (polyethylene normally and sits within the Proximal Section)

**Glenoid components:**
Head (ball shaped implant below)
Plate (Normally metal which holds the head and gets screwed into the glenoid bone)