



For the attention of the operating surgeon

## Catalyst R1 Reverse Shoulder System Instructions for Use

### **Device Description**

The Catalyst R1 Reverse Shoulder System is a total shoulder prosthesis designed for use in patients with a non-functional rotator cuff. The articulation of this reverse design is inverted compared to a traditional anatomic total shoulder prosthesis, where the articulating sphere is on the glenoid side of the joint, and the mating cup is fixed into the humeral stem implant.

The humeral implant system consists of humeral stems and articulating inserts. The humeral stems are monolithic implants that have a tri-fin geometry to provide rotational stability to the implant. The humeral stems are manufactured from Ti-6Al-4V with porous structure on the proximal portion. The humeral stems are offered in short and long stem configurations to accommodate varying bone geometries. The humeral articulating inserts are manufactured from UHMWPE and have a snap-fit connection with the humeral stem. The inserts have a concave bearing geometry that radially matches the different sized glenospheres, and are offered in varying thicknesses to achieve stability of the glenohumeral joint.

The glenoid implant system consists of a central baseplate, glenosphere, fixation elements, and locking components. The central baseplate is a circular disc that rests against the glenoid bone and is secured to the bone using up to four 4.5mm peripheral screws and either a central 6.5mm screw or 6.5mm post. The central baseplate is manufactured from Ti-6Al-4V with a commercially pure Titanium plasma spray on the bone facing surface. The central baseplate is offered in a standard and a 10° augmented configuration. The Co-Cr-Mo glenosphere is secured to the central baseplate by a taper lock, with the additional fixation of a locking screw.

### **Indications for Use**

The Catalyst R1 Reverse Shoulder System is a reverse total shoulder replacement for patients with a functional deltoid muscle and a grossly deficient rotator cuff joint suffering from pain and dysfunction due to:

- Severe arthropathy with a grossly deficient rotator cuff;
- Previously failed joint replacement with a grossly deficient rotator cuff;
- Fracture of glenohumeral joint from trauma or pathologic conditions of the shoulder including humeral head fracture, displaced 3- or 4-part fractures of proximal humerus, or reconstruction after tumor resection;
- Bone defect in proximal humerus;
- Non-inflammatory degenerative disease including osteoarthritis and avascular necrosis of the natural humeral head and/or glenoid;
- Inflammatory arthritis including rheumatoid arthritis;
- Correction of functional deformity

The humeral stems are intended for cemented or uncemented applications.

The glenoid baseplate is intended for uncemented use with the addition of screws for fixation.

### **Contraindications**

Use of the Catalyst R1 Reverse Shoulder System is contraindicated in the following conditions:

- Non-functional deltoid muscle
- Local or systemic infection, or osteomyelitis of the proximal humerus or scapula; if a systemic infection or a secondary remote infection is suspected or confirmed, joint replacement surgery should be delayed until infection is resolved
- Inadequate or malformed bone that precludes adequate support or fixation of the prosthesis
- Neuromuscular disorders that do not allow control of the joint
- Chronic instability or deficient soft tissues and other support structures (e.g., brachial plexus)
- Vascular insufficiency
- Patient's age, weight or activity level cause the surgeon to expect early failure of the system
- The patient is unwilling or unable to comply with the post-operative care instructions
- Alcohol, drug, substance abuse or other conditions that would affect or impair the patient from complying with post-operative instructions.
- Patients with known sensitivity to Co-Cr-Mo alloys typically used in prosthetic devices
- Any disease that could adversely affect the function or expected longevity of the implants (e.g., metabolic disorders).

### **Warnings & Precautions**

The orthopedic surgeon must be fully knowledgeable about all aspects of the Catalyst R1 Reverse Shoulder System surgical technique and use these implants in accordance with the indications and contraindications summarized in this IFU. The Catalyst R1 components are not designed for and should not be used with components from other implant systems or manufacturers. The Catalyst R1 Reverse Shoulder System is intended for use only with Catalyst R1 Reverse Shoulder System instrumentation, unless generic instrumentation is specified (e.g., power saw) in the surgical technique.

Only qualified orthopedic surgeons knowledgeable in anatomy, biomechanics, and reconstructive surgery should utilize the Catalyst R1 Reverse Shoulder System. Proper size selection, placement, positioning, alignment and/or cemented fixation are required to achieve the expected longevity of the implants. The implants must be dry and free of surgical debris to ensure proper connection of components and fixation with cement.

### **Patient Selection**

As part of the pre-operative, patient selection process; the orthopedic surgeon must ensure that no biological, biomechanical or other factors exist that might prohibit the use of the Catalyst R1 Reverse Shoulder System. For example:

- Bone must be of sufficient quality to prevent the prostheses from loosening.
- Patients who are currently smokers are at risk for slower post-operative healing, infection and potential early loosening of the devices.
- The physical size, weight and activity levels of the patient may affect the expected useful life of the implants.

The use of prostheses in extremely large, heavy or active patients may result in early failure of the devices (e.g., implant fracture, loosening).

### **Possible Adverse Events**

The following adverse events have been reported after shoulder surface replacement surgery and are possible outcomes with the use of the Catalyst R1 Reverse Shoulder System:

- Loosening or instability of the components
- Infection
- Osteolysis
- Reaction due to metal sensitivity
- Fracture of the components or the bone
- Wear and damage to articular surfaces
- Adverse events related to the use of bone cement
- Impingement
- Overstuffing of the joint if the incorrect size of prosthesis is used
- Stiffness
- Myositis ossificans
- Ankylosis

Some adverse events may require revision surgery or fusion of the joint.

In addition, the following adverse events are possible after any shoulder arthroplasty:

- Nerve injury
- Deep vein thrombosis
- Hematoma
- Pneumonia
- Cardiovascular disorders
- Systemic pain

### **MRI Safety Information**

The components of the Catalyst R1 Reverse Shoulder System have not been evaluated for safety and compatibility in the MR environment. They have not been tested for heating, migration, or image artifact in the MR environment. The safety of the Catalyst R1 Reverse Shoulder System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

### **Sterility**

The components of the Catalyst R1 Reverse Shoulder System are provided sterile and are intended for single use only. Do not use if the sterility of the components is potentially compromised. Never re-use or re-sterilize any component.

### **Patient Counseling Information**

Patients that are more active, have unrealistic expectations or fail to follow post-operative care may be more likely to have failure or complications associated with their total shoulder prosthesis. Failure of the prostheses can include wear, dislocation, fracture or other complications. The patient must be counseled regarding the total shoulder prostheses and the impact it may have on activities of daily living. Prosthetic joints are not as durable as natural, healthy joints and may not last the lifetime of the patient. The life of the implant may vary greatly depending on many factors and it may need to be replaced during the lifetime of the patient.

Questions or comments regarding the use of this device should be directed to Catalyst OrthoScience Customer Service.