NanoOrtho, LLC.
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NanoOrtho NanoKnee® Instructions for Use - Implants

THE NANOKNEE JOINT REPLACEMENT PROSTHESES
ATTENTION OPERATING SURGEON

Description:

The NanoOrtho NanoKnee® System includes femoral components and tibial tray/insert components that are designed to be used together to replace the knee joint. The components are designed for cemented or uncemented fixation to the bone. All components are available in a range of sizes.

Materials:

Femoral Components:	CoCrMo Alloy – ASTM F-75
Tibial Plates:	Titanium Alloy – ASTM F-136
Tibial Bearings:	UHMWPE (cross-linked) – ASTM F-2565

Indications for Use:

The NanoOrtho NanoKnee® System is indicated for restoring either compartment of a knee that has been affected by the following:

1. Noninflammatory degenerative joint disease including osteoarthritis, traumatic arthritis, or avascular necrosis;
2. Correction of femoral deformity;
3. Revision procedures where other treatments or devices have failed; and
4. Treatment of fractures that are unmanageable using other techniques.

The NanoOrtho NanoKnee® System components are single use and are intended for implantation with or without bone cement.

Contraindications:

1. Cases where there is poor bone stock which would make the procedure unjustifiable.
2. Active, local infection or previous intra-articular infections.
3. Mental or neurologic conditions that tend to pre-empt the patient's ability or willingness to restrict activities.
4. Neuropathic (Charcot) joint.
5. Conditions that tend to place increased loads on implants such as age, weight, and activity level, which are incompatible with a satisfactory long-term result.

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6. Collateral ligament insufficiency (except in cases where a constrained knee system is indicated and used).
7. Skeletal immaturity.

Warnings:

Improper selection, placement, positioning, alignment and fixation of the implant components may result in unusual stress conditions which may lead to subsequent reduction in the service life of the prosthetic components. Malalignment of the components or inaccurate implantation can lead to excessive wear and/or failure of the implant or procedure. Inadequate preclosure cleaning (removal of surgical debris) can lead to excessive wear. Use clean gloves when handling implants. Laboratory testing indicates that implants subjected to body fluids, surgical debris or fatty tissues have lower adhesion strength to cement than implants handled with clean gloves. Improper preoperative or intraoperative implant handling or damage (scratches, dents, etc.) can lead to crevice corrosion, fretting, fatigue fracture and/or excessive wear. Do not modify implants. The surgeon is to be thoroughly familiar with the implants and instruments prior to performing surgery. Revision surgery may be required to prevent component failure. Care is to be taken to assure complete support of all parts of the device embedded in bone cement to prevent stress concentrations, which may lead to failure of the procedure. Complete preclosure cleaning and removal of bone cement debris, metallic debris, and other surgical debris at the implant site is critical to minimize wear of the implant articular surfaces. Implant fracture due to cement failure has been reported. It is the responsibility of the operating surgeon to determine whether there is adequate initial fixation and stability.

The NanoOrtho NanoKnee® System joint replacement prostheses provide the surgeon with a means of reducing pain and restoring function for many patients. While these devices are generally successful in attaining these goals, they cannot be expected to withstand the activity levels and loads of normal healthy bone and joint tissue.

Accepted practices in postoperative care are important. Failure of the patient to follow postoperative care instructions involving rehabilitation can compromise the success of the procedure. The patient is to be advised of the limitations of the reconstruction, and the need for protection of the implants from full load bearing until adequate fixation and healing have occurred. Excessive activity, trauma and excessive weight have been implicated with premature failure of the implant by loosening, fracture, and/or wear. Loosening of the implants can result in increased production of wear particles, as well as accelerate damage to bone, making successful revision surgery more difficult. The patient is to be made aware and warned of general surgical risks, possible adverse effects as listed, and to follow the instructions of the treating physician including follow-up visits.

Precautions:

Specialized instruments are designed for the NanoOrtho NanoKnee® System joint replacement system to aid in the accurate implantation of the prosthetic components. The use of instruments or implant components from other systems can result in inaccurate fit, sizing, excessive wear and device failure. Intraoperative fracture or breaking of instruments has been reported. Surgical instruments are subject to wear with normal usage. Instruments, which have experienced extensive use or excessive force, are susceptible to fracture. Surgical instruments should only be used for their intended purpose. All instruments should be regularly inspected for wear and disfigurement.

Do not reuse implants. While an implant may appear undamaged, previous stress may have created imperfections that would reduce the service life of the implant. Do not treat patients with implants that have been, even momentarily, placed in a different patient.

Possible Adverse Effects:

1. Material sensitivity reactions. Implantation of foreign material in tissues can result in histological reactions involving various sizes of macrophages and fibroblasts. The clinical significance of this effect is uncertain, as similar changes may occur as a precursor to or during the healing process. Particulate wear debris and discoloration from metallic and polyethylene components of joint implants may be present in adjacent tissue or fluid. It has been reported that wear debris may initiate a cellular response resulting in osteolysis, or osteolysis may be a result of loosening of the implant.
2. Early or late postoperative infection and allergic reaction.
3. Intraoperative bone perforation or fracture may occur, particularly in the presence of poor bone stock caused by osteoporosis, bone defects from previous surgery, bone resorption, or while inserting the device.
4. Loosening or migration of the implants can occur due to loss of fixation, trauma, malalignment, bone resorption or excessive activity.
5. Periarticular calcification or ossification, with or without impediment of joint mobility.
6. Inadequate range of motion due to improper selection or positioning of components.
7. Undesirable shortening of limb.
8. Dislocation and subluxation due to inadequate fixation and improper positioning. Muscle and fibrous tissue laxity can also contribute to these conditions.
9. Fatigue fracture of component can occur as a result of loss of fixation, strenuous activity, malalignment, trauma, nonunion, or excessive weight.
10. Wear and/or deformation of articulating surfaces.
11. Valgus-varus deformity.
12. Transient peroneal palsy secondary to surgical manipulation and increased joint movement has been reported following knee arthroplasty in patients with severe flexion and valgus deformity.
13. Patellar tendon rupture and ligamentous laxity.
14. Interoperative or postoperative bone fracture and/or postoperative pain.

Removal/Revision of Device:

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Intentional removal of a partial knee component can be accomplished by careful use of cutting burrs, thin and narrow osteotomes and cautious extraction forces. For further information about removal or revision of device please contact NanoOrtho, LLC at the address or telephone number below.

Sterility:

All prosthetic components, with the exception of tibial inserts, are sterilized by exposure to a minimum dose of 25 kGy of gamma radiation. All tibial inserts are sterilized by ethylene oxide. Do not resterilize. Do not use any component from an opened or damaged package. Do not use implants after expiration date.

Safety Information in the Magnetic Resonance (MR) Environment:

The NanoOrtho NanoKnee® System has not been evaluated for safety and compatibility in the MR environment. The NanoOrtho NanoKnee® System has not been tested for heating or migration in the MR environment.

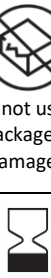
Caution: Federal law (USA) restricts this device to sale, distribution, or use by or on the order of a physician.

Information:

Comments regarding the use of this device can be directed to:

Attn: Customer Service, NanoOrtho LLC, 860 Oak Park Blvd., Suite 301. Arroyo Grande, CA 93420, USA
TEL: +1 (805) 202-3321
FAX: +1 (855) 710-7338
EMAIL: service@nanoortho.com

Symbol Label Key:

 Manufacturer	 Date of Manufacture	 Do not use if package is damaged	 Do Not Reuse	 Batch Code	 Catalog Number
 Non Sterile	 Caution, consult Accompanying documents	 Use by YYYY-MM-DD	 Consult Instructions for Use	 Sterilized using Ethylene Oxide	 Sterilized Using Radiation

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