8.0 510(K) SUMMARY

MAY 2 4 2013

Submitter's Name and Address	ConforMIS Inc. 28 Crosby Drive Bedford, MA 01730
Establishment Registration Number	3009844603
Date of Summary	April 11, 2013
Contact Person	Amita S. Shah, Vice President, Regulatory and Quality Affairs
Telephone Number	(781) 345-9164
Fax Number	(781) 345-0104
Name of the Device	ConforMIS iTotal® CR Knee Replacement System (iTotal CR KRS)
Common or Usual Name	Cruciate Retaining Total Knee Replacement System
Classification Name	Knee joint patellofemorotibial polymer/metal/polymer semi-constrained cemented prosthesis
Device Classification	Product Code: JWH, Knee joint patellofemorotibial polymer/metal/polymer semi-constrained cemented prosthesis. OOG, Knee Arthroplasty Implantation System Intended to be used to assist in the implantation of a specific knee arthroplasty device or a set of specific knee arthroplasty devices. Indicated to include guiding alignment, making or establishing cuts, selecting, sizing, attaching, positioning or orienting implant components. OIY, Prosthesis, knee, patellofemorotibial, semi-constrained, cemented polymer + additive/metal/polymer + additive. This generic type of device includes prosthesis that have a femoral component made of alloys, such as cobalt-chromium-molybdenum, and a tibial component(s) and/or a retropatellar resurfacing component made of ultra-high molecular weight polyethylene plus an additive, such as a-tocopherol.

510(K) SUMMARY CONTINUED

Indications for Use

The iTotal® CR Knee Replacement System (iTotal CR KRS) is intended for use as a total knee replacement in patients with knee joint pain and disability whose conditions cannot be solely addressed by the use of a prosthetic device that treats only one or two of the three knee compartments, such as a unicondylar, patellofemoral or bicompartmental prosthesis.
The Indications for Use include:

- Painful joint disease due to osteoarthritis, traumatic arthritis, rheumatoid arthritis or osteonecrosis of the knee.
- Post traumatic loss of joint function.
- Moderate varus, valgus or flexion deformity in which the ligamentous structures can be returned to adequate function and stability.
- Failed osteotomies, hemiarthroplasties, and unicondylar, patellofemoral or bicompartmental implants.
- Revision procedures provided that anatomic landmarks necessary for alignment and positioning of the implant are identifiable on patient imaging scans.

This implant is intended for cemented use only.

Identification of the Legally Marketed Device (Predicate Device)

ConforMIS iTotal CR Knee Replacement System (iTotal CR KRS)

Device Class:	II
Product Code:	JWH, OOG, OIY
Regulation Number:	21 CFR 888.3560
510(k) number:	K120316 and K122870

510(K) SUMMARY CONTINUED

Device Description

The iTotal CR Knee Replacement System (hereafter referred to as the "iTotal CR KRS") is a patient specific tricompartmental faceted posterior cruciate ligament (PCL) retaining knee replacement system. The iTotal CR KRS is a semi-constrained cemented knee implant which consists of a femoral, tibial and patellar component.

Using patient imaging (either CT or MR scans) and a combination of proprietary and off-the-shelf software a patient specific implant is designed that best meets the geometric and anatomic requirements of the specific patient. The femoral component is manufactured from cobalt chromium molybdenum ("CoCrMo") alloy. The tibial component includes a metal tray manufactured from CoCrMo alloy and either one or two polyethylene inserts. The polyethylene inserts may be manufactured from UHMWPE or from a highly cross-linked Vitamin E infused polyethylene (iPoly XE™). The patellar component is also manufactured from UHMWPE or from a highly cross-linked Vitamin E infused polyethylene (iPoly XE).

For user convenience, and similar to the predicate iTotal CR KRS, accessory orthopedic manual surgical instruments designed for use with the modified iTotal CR KRS are provided to assist with implantation. The ancillary instruments are provided sterile and for single-use only. These patient specific instruments are provided to assist in the positioning of total knee replacement components intraoperatively and guiding the cutting of bone.

The function and general design features of the patient specific ancillary instruments remain similar to those described in the predicate 510ks i.e. K120316 and K122870.

Substantial Equivalence

The product subject of this premarket notification is substantially equivalent to the iTotal Cruciate Retaining Knee Replacement System (K120316 cleared April 19, 2012 and K122870 cleared January 14, 2013) and other currently marketed, cemented total knee replacement systems. The following testing was performed to establish substantial equivalence:

- Tibial interlock assembly and disassembly testing
- Contact area/contact stress testing
- Constraint testing
- Design validation via cadaveric testing

510(K) SUMMARY CONTINUED

Device Comparison

Attribute	Predicate iTotal CR Knee Replacement System (K120316 and K122870)	Modified Device iTotal CR Knee Replacement System (This submission)
Components	• Femoral Component • Tibial Implant Metal Backed Tibial Component • Patellar component	• Femoral Component • Tibial Implant Metal Backed Tibial Component • Patellar component
Materials	• Femoral Implant: CoCrMo • Metal Backed Tibial Components: o Tibial tray: CoCrMo o Single or dual Tibial Inserts: UHMWPE or iPoly XE (highly cross-linked Vitamin E infused polyethylene) • All Polymer Patellar Component: UHMWPE or iPoly XE (highly cross-linked Vitamin E infused polyethylene)	• Femoral Implant: CoCrMo • Metal Backed Tibial Components: o Tibial tray: CoCrMo o Single or dual Tibial Inserts: UHMWPE or iPoly XE (highly cross-linked Vitamin E infused polyethylene) • All Polymer Patellar Component: UHMWPE or iPoly XE (highly cross-linked Vitamin E infused polyethylene)
Design	Knee joint patellofemorotibial semi-constrained cemented prosthesis	Knee joint patellofemorotibial semi-constrained cemented prosthesis
Principle of Operation	Cemented Use Fixed Bearing Design	Cemented Use Fixed Bearing Design
Patient Matched	Yes	Yes
Patellar Design/ Dimensions	Symmetrical, offered in various sizes	Symmetrical, offered in various sizes
Tibial Implant interlock design	• Interference fit • Anterior lip • Undercuts on medial and lateral sides with Central Spine • Full Posterior Scallops on Tray, Step-Up on Inserts • Insert Snap Features	• Interference fit • Anterior lip • Increased undercuts on medial and lateral sides with Central Spine • Reduced Posterior Scallops on Tray, Step-Up Removed on Inserts • Increased Insert Snap Width Features
Tibial Slope	• Fixed at 5 degrees	• Fixed at 5 degrees or cut option of patient specific tibial slope
Minimum Thickness of Tibial Insert (UHMWPE)	6 mm	6 mm

Attribute	Predicate iTotal CR Knee Replacement System (K120316 and K122870)	Modified Device iTotal CR Knee Replacement System (This submission)
Posterior Cruciate Ligament (PCL) Sparing	Yes	Yes
Instrumentation	Patient specific Nylon jigs	Patient specific Nylon jigs

510(K) SUMMARY CONTINUED

Description and Conclusion of Testing	**Nonclinical Testing:** The determination of substantial equivalence for this device was based on a detailed device description. The following non-clinical laboratory testing was performed demonstrating that the device is safe and can be considered substantially equivalent to the predicate device for the intended use: • Tibial interlock assembly and disassembly testing • Contact area/contact stress testing • Constraint testing • Cadaveric testing
Safety and Performance	The determination of substantial equivalence for this device was based on a detailed device description. Non-clinical laboratory testing was performed demonstrating that the device is safe and can be considered substantially equivalent to the predicate device for the proposed intended use. Clinical data is not necessary to demonstrate substantial equivalence.
Conclusion	Based on the testing conducted it is concluded that the modified device is substantially equivalent to the iTotal Cruciate Retaining Knee Replacement System, K120316 cleared April 19, 2012 and K122870 cleared on January 14, 2013.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

May 24, 2013

ConforMIS, Incorporated
% Ms. Amita Shah
Vice President and Quality Affairs
28 Crosby Drive
Bedford, Massachusetts 01730

Re: K131019
Trade/Device Name: iTotal CR Knee Replacement System
Regulation Number: 21 CFR 888.3560
Regulation Name: Knee joint patellofemorotibial polymer/metal/polymer semi-constrained cemented prosthesis
Regulatory Class: Class II
Product Code: JWH, OOG, OIY
Dated: May 13, 2013
Received: May 14, 2013

Dear Ms. Shah:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21

CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

For Erin I. Keith

Mark N. Melkerson
Director
Division of Orthopedic Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): K131019

Device Name: iTotal CR Knee Replacement System

Indications for Use:

The iTotal® CR Knee Replacement System is intended for use as a total knee replacement in patients with knee joint pain and disability whose conditions cannot be solely addressed by the use of a prosthetic device that treats only one or two of the three knee compartments, such as a unicondylar, patellofemoral or bicompartmental prosthesis.

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- Failed osteotomies, hemiarthroplasties, and unicondylar, patellofemoral or bicompartmental implants.
- Revision procedures provided that anatomic landmarks necessary for alignment and positioning of the implant are identifiable on patient imaging scans.

The implant is intended for cemented use only.

Prescription Use ____X____ (Part 21 CFR 801 Subpart D) AND/OR Over-The-Counter Use _____ (21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE OF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Casey L. Hanley, Ph.D.
Division of Orthopedic Devices