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Healthcare

cuVis JOINT

CUVIS JOINT

UP

Safety

Consistency

Surgical Accuracy

Flexible

DOWN

Surgical Error

Complications

Side Effect

Possibility of Re-operation

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Overview

CUVIS Joint® robot system for artificial joint surgery is the most advanced surgical equipment capable of 3D pre-planning, virtual surgery and precise cutting to provide accurate and precise surgery results.

It is a user-friendly surgical robot equipped with the values of Innovative, Flexibility and Easiness of use with the basic offering of accuracy and safety at its best.

01 Main Console

- ☑ System Monitor
- ☑ Optical tracking system (OTS)

02 Robotic Arm

- ☑ Operating Software
- ☑ Main Controller
- ☑ Robot Arm
- ☑ Milling Tool
- ☑ Irrigation

03 Planner

- ☑ Surgical Planning Software

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Key Features

Product & Class	Automation Robot surgical system (Class 3)
Planning	3D CT Base surgical planning
Cutting	Fully automatic cutting (Milling) No cutting guides (jigs) required Tibial cut including keel preparation Fully finished femur with all the cuts and peg holes
Safety	Emergency stop & Manual guide
Detection	OTS (Optical Tracking System)
Robot cutting	Max. 50mm/sec
Robot precision	Repeat precision < 0.5mm / Positioning accuracy < 1mm
Other features	Wide surgical space and high freedom (6axis articulated robot) Patient-Robot Position Guide (Surgical space check) Speed control during cutting Compact hardware, minimize product space

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Why Robotic Artificial Joint Surgery is good?

01 Personalized pre-planning

As each person has a different face, the shape of bone is also different. Meril's artificial joint surgical robot CUVIS Joint® shows the patient's bone in 3D images, and the doctor can use those images for pre-planning of surgery personalized for the patient.

02 Pre-selection of artificial joint and precise insertion of artificial joint

What's as important as the precise surgical plan is to select and insert the personalized artificial joint. The doctor uses robot to select an artificial joint for the patient and insert it accurately.

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Why Robotic Artificial Joint Surgery is good?

03 Precise cutting for sub-millimeter accuracy and optimum alignment

Precise cutting serves the optimum result. CUVIS Joint® provides the correct alignment of a patient's leg axis with the sub-millimeter dimensional accuracy and precise cutting for the optimal surgical outcome.

04 Reduction of side effect and reoperation

CUVIS Joint® reduces side effects like inequality of limb length, pulmonary embolism, and fracture. The risk of infection is also reduced because of fewer instruments in use than in conventional surgery.

Cuvis Joint Knee Replacement Process

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
				
Patient Selection	CT Scan	Pre-Surgical Planning	Surgical Implementation	Implant Placement

STEP 1.

Patients can decide upon robotic artificial joint surgery after consulting with the doctor

STEP 2.

CT scanning.

STEP 3.

The scanned CT image is converted into a 3D image for diagnosing the patient's condition and make a surgical plan as required.

FMA, TMA Setting	Rotation	Implant Selection	Virtual Surgery
Mechanical axis setting between Femur and Tibia	Image based External Rotation setting of patient's bone		A virtual check of post-operative alignment of patient's leg (Femur/Tibia)

*FMA : Femoral Mechanical Axis/TMA : Tibia Mechanical Axis

STEP 4.

The patient is connected to the robot and stabilized for surgery. In the next stage, the doctor performs registration process to verify if the 3D image of the patient matches the original surgery site.

After registration process, robot reviews the data and cuts the bone precisely with respect to size, position, angle and direction of the implant decided during pre-surgery planning stage.

STEP 5.

Insert and fix the decided implant for surgery conclusion.

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Advantages of Cuvis Joint

Simplicity

- Bone registration using probe
- Improved workspace check
- 3D bone model generation with fast and easy CT image data
- UI design considering user convenience
- Reduce the surgery preparation time- 3D modeling, Non-Sterile/Sterile Diagnosis

Flexibility

- Various cutting options
  -Full and partial cutting
  -change cutting order
- Intra-operative Gap Check
  -Pre/Intra/Post
- Plan changing, Gap Balancing possible

Safety

- Real-time system monitoring
  Emergency stop & force freeze
  Manual guide of robot arm

Accuracy

- Precise pre-surgical planning executed every time
- Sub-millimeter dimensional accuracy
- Optimal Alignment

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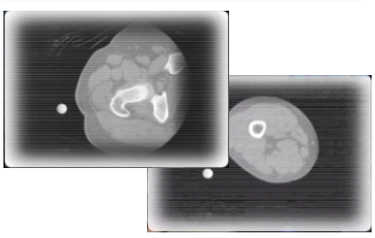
Surgical Process

1. Scan

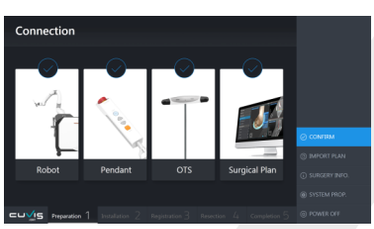


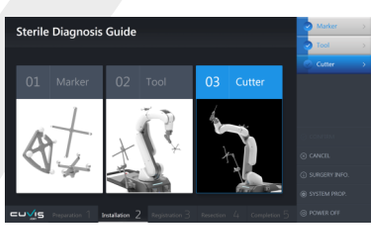
- CT Scan

2. Surgical Planning

- CT Data Loading
- Set up surgical Plan

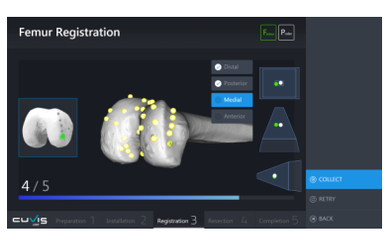
3. System Diagnosis





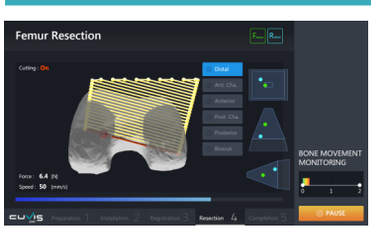
- Non-Sterile / Sterile
- Tool and Base Marker Positioning

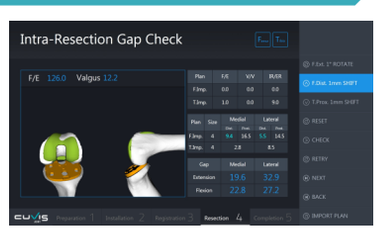
4. Registration



- Patient setup &
-Registration with Patient Bone Model

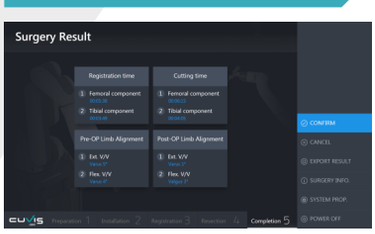
5. Cutting / Gap Check





- Measured Resection / Modified gap technique
- Pre / Intra / Post - Resection gap check

6. Surgery Result / Implant Insertion



- Check cutting results & Implant insertion
- Robot out

Intraoperative Assistance

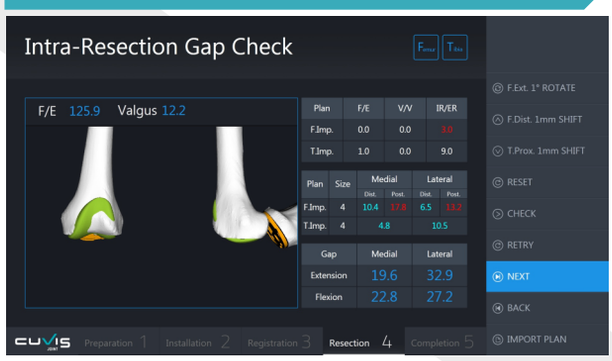
Intra-Resection Gap Check & Plan Changing

1. Initial Planning

2. Femoral Shift

3. Tibial Shift

4. Femoral Rotation



5. Re-Planning

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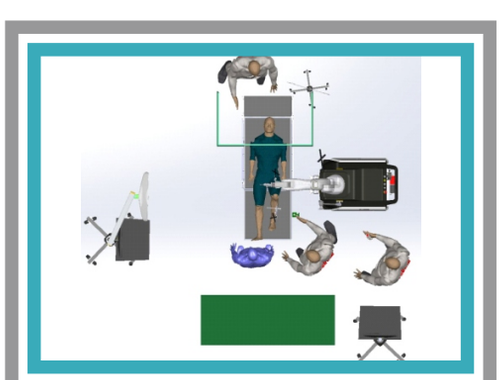
Site Design

BIRD VIEW



TOP VIEW

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