



## Automated Robotics for Knee Joints

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Fully automated image based robots are the robotic surgical apparatus in the true sense. Most of the planning is done on the computer screen preoperatively and the execution of cuts is done by the robotic mill. The patellar cuts are not performed by any robot.

The planning offers some advantage to surgeons who prefer kinematic alignment. Mechanical alignment is not much different than those available with the zigs, the robot helps to avoid entering the canal and thus possibly reduce chances of fat embolism and also reduces bleeding.

Although the robot will take the femoral and the tibial cuts, the finishing of cuts, gap balancing and cementing the prosthesis and closure of the opened wound will be done by surgeon.

Intraoperative changes can be made if unsatisfactory alignment or imbalance in gaps is noticed. Even in those changes there could be restrictions and one may have to go back to manual assistance. Thus giving due importance to the Man behind the machine adaptability to the newer technology could help the surgeon, not necessarily the patient.

While the robotic arm in imageless robots can help by creating haptic boundaries, the surgeon will have to be there for all the femoral and tibial bony cuts.

Image based robots could mean spending a bit more for the ct scan but the planning definitely offers better scope for the surgeon to check the progress as planned.

There are many things to still evolve in the robotics like the pin size, tracker size, the foot stand, software for different kinds of implants and many more aspects.

The implants companies are securing their future by selling robots, by determining the maximum use of the implant design for the robot that is sold.

Once the entire surgical world goes the robotic way, there will be a lot more evolution, there will be outdated softwares every six months and the recurring expenses of the robotic machine parts are going to make this surgery more expensive and the implant companies manufacturing the robot is going to be the biggest profiteers.

Its going to create an industry where in lots of literature will also be written and journals will be kept busy. More and more research in making robots will take away all the funds.

Human skills will deteriorate and dependence on such robots will be enslaving culture.

And after doing so much in the orthopedic industry, will the success rate of joint replacement surgery improve from 96% to 100%.

No it can not eliminate infection, loosening. We still do not know if kinematic alignment is better than mechanical alignment. And there will be more issues to keep the thought process busy.

Lets go back to the bottom line. Will it help the patients for getting better outcomes and better longevity of joints?

The question will remain unanswered for the next 25 yrs.

Lets hope for the best.