



CUSTOMIZED VIRTUAL PLANNING

iBlock® is an intelligent instrument allowing intraoperative customization in TKA using real-time virtual planning technology followed by automated placement of the cutting guide.



 iBlock®

Praxim® Custom Automated Surgical Navigation

The NanoStation®, iBlock® and NanoBlock® afford the surgeon and patient significant advantages when compared to more traditional forms of navigation.

Patient-specific real time virtual surgery

- Allows the surgeon to intraoperatively customize the operative plan.
- Precise measurements made dynamically in real time, lessening dependence on the static review of two-dimensional X-rays during pre-operative planning.

No Requirement for CAT or MRI scans

- No additional radiation exposure for the patient
- No delay in scheduling patients for surgery while waiting for the manufacture of custom blocks
- No additional planning time for the surgeon
- Eliminates additional patient travel time or time spent waiting for scans to be performed
- No additional costs incurred by the patient or reimbursement system

Five distal femoral osteotomies are guided by a single, automated cutting guide mounted to the iBlock

- Less chance of inaccuracies incurred by using multiple cutting guides or blocks
- Integrity of cutting planes are maintained
- True pin-less cutting guide for all distal femoral cuts
- Reduces incidence of lost instruments

IM Rod is eliminated

- Reduces the potential of formation of emboli
- Reduces invasiveness of procedure by protecting the integrity of the intramedullary canal

NanoBlock provides for a single instrument to be used for tibial preparation

- Precise, micrometric adjustments are achieved in three planes - Varus / Valgus, cut depth, and posterior slope



Publications of Interest

1. Gonzales FB, Engh, Jr. CA, Ammeen D, Hopper R. Accuracy of CT-Based Patient Specific Total Knee Arthroplasty Instruments. AAHKS 2010 Poster #7

Conclusion: CT generated guides allowed one surgeon make bone resections that were within 2mm of the plan. Leg alignment is similar to that obtained with traditional instruments but not as good as imageless computer assisted total knee arthroplasty. If we assume leg alignment is related to revision rates, the additional cost of this technique will have to be recouped with operating room efficiencies such as reduced surgical time and sterilization costs rather than reduced revision rates.

2. Koulalis D, O'Loughlin PF, Plaskos C, Kendoff D, Cross MB, Pearle AD. Sequential versus automated cutting guides in computer-assisted total knee arthroplasty. *Knee*. 2010 Sep 11. [Epub] Keywords: Computer-assisted TKA, Robotic knee, Cutting guides, Precision, Accuracy, Operative time.

Abstract: The accuracy and efficiency of automated cutting guides in CAS systems have not been previously compared with conventional CAS techniques. Therefore, it is not yet clear if these more advanced technologies are warranted. We hypothesized that a novel automated cutting guide with CAS for total knee arthroplasty would be more efficient and more accurate than conventional navigation with sequential cutting blocks. Twelve cadaver legs were used in total. Each leg was randomly assigned to either an automated guide positioning or a conventional freehand computer-navigated guide positioning. The guide positions postosseous fixation and the final bone-cut surfaces were digitized and compared to the targeted cutting planes. The final location of the impacted trial implant was also digitized and compared to the planned implant location. The time for each step and the total time taken to prepare the femur were measured for both groups. The mean femoral preparation time was shorter with the automated cutting guide than the conventional method (5.5 min versus 13.8 min, $p < 0.001$). The average deviation in the final bone resections from the planned resections was significantly lower for the automated cutting guide in the frontal/rotational plane (0.55° versus 1.1°), sagittal plane (0.75° versus 2.0°), and cut height direction (0.56 mm versus 1.6 mm). Therefore, based on these results, we concluded that automated cutting-guide positioning resulted in more efficient and more accurate femoral cuts in comparison to the conventional navigation method in a cadaveric model. © 2010 Published by Elsevier B.V.

3. Koulalis D, O'Loughlin PF, Plaskos C, Kendoff D, Pearle AD. Adjustable cutting blocks for computer-navigated total knee arthroplasty a cadaver study. *J Arthroplasty*. 2010 Aug;25(5):807-11.

Abstract: Computer-navigation in total knee arthroplasty has been reported to increase accuracy but also procedure duration. We compared surgical time and precision using a novel adjustable cutting block vs freehand navigation with conventional blocks on 12 bilateral cadaver tibiae. The mean time required was significantly less to position the adjustable block than the conventional block (2 minutes 10 seconds vs 6 minutes 35 seconds, $P = .006$). Guide positioning precision (standard deviation) for the adjustable block vs conventional block was as follows: varus/valgus, 0.24° vs 1.16° ($P = .015$); posterior slope, 0.35° vs 0.74° ($P = .13$); and cut height, 0.37 vs 1.41 mm ($P = .010$). There were no significant differences in the final bone cut accuracy between the 2 groups. The use of adjustable cutting blocks simplifies navigated procedures and may reduce the time required to perform a navigated total knee arthroplasty. Keywords: computer navigation, total knee arthroplasty, cutting guides, precision, accuracy, operative time. © 2010 Elsevier Inc. All rights reserved.

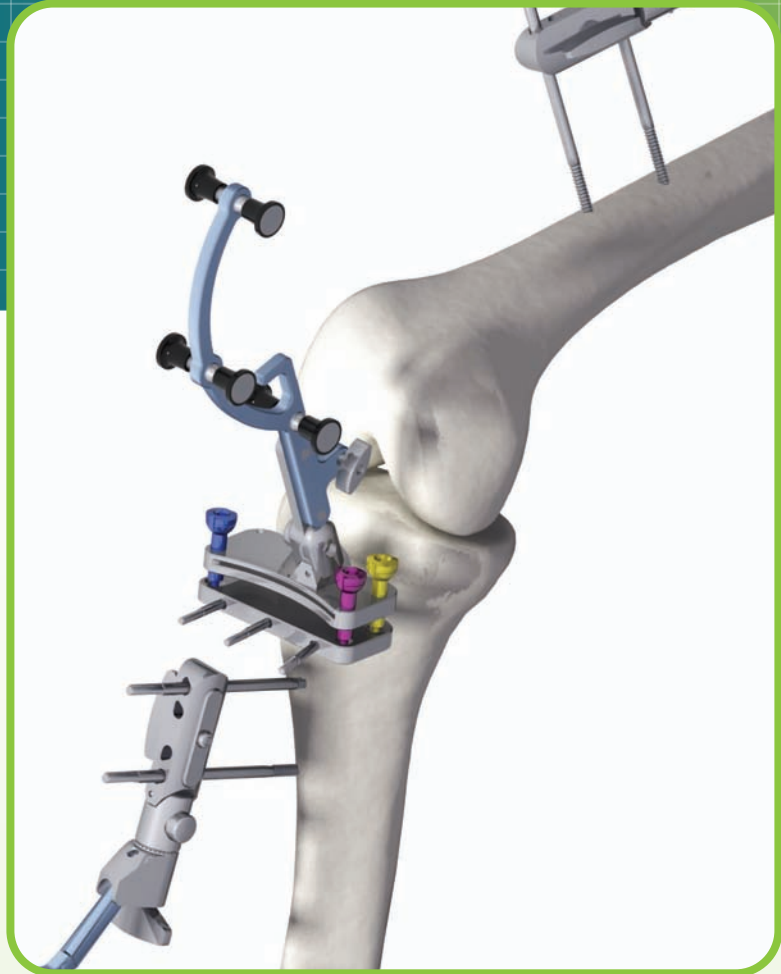
4. Stiehl JB, Jackson S, Szabo A. Multi-factorial analysis of time efficiency in total knee arthroplasty. *Comput Aided Surg*. 2009;14(1-3):58-62.
5. Stindel E, Briard JL, Merloz P, Plaweski S, Dubrana F, Lefevre C, Troccaz J. Bone morphing: 3D morphological data for total knee arthroplasty. *Comput Aided Surg*. 2002;7(3):156-68.
6. Böhling U, Schamberger H, Grittner U, Scholz J. Computerised and technical navigation in total knee-arthroplasty. *J Orthopaed Traumatol* 2005, 6:69–75.





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The Nanoblock[®] allows precise, micrometric adjustment of the varus / valgus angle, depth and slope of the tibial cut.



NanoBlock[®]

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PMC-001 rev 02/11