Enhanced Possibilities for Surgical Navigation

NaviVision™

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Clinical images courtesy of Charité Berlin,
Center for Musculoskeletal Surgery,
Clinic for Trauma and Reconstructive Surgery.

Intraoperative imaging and surgical navigation of the new dimension – through integration of trendsetting technologies

Siemens Medical Solutions and BrainLAB introduce a new era of surgical navigation. NaviVision™ is the first system that combines an optical navigation system and a mobile C-arm into a common platform.

NaviVision features outstanding user friendliness and minimizes space and time needed in the OR.

By integrating the navigation system into the C-arm monitor trolley, the required footprint is reduced by 20% in comparison to a stand-alone navigation system. The system preparation and setup time is reduced by 30% compared to single components.

The navigation monitor of NaviVision is attached directly to the monitor trolley of the C-arm and can be set horizontally or vertically on an adjustable swivel arm.

The swivel arm can be fully sterilized. The monitor can be removed from the trolley easily and quickly attached directly to the OR table where it can be adjusted to the surgeon's needs.

The surgeon can easily operate NaviVision via a touchscreen. This navigation screen simultaneously shows axial, lateral and sagittal views of the relevant anatomy. The touchscreen also allows the surgeon to switch between different navigation instruments. A DICOM interface allows for easy documentation of image data and transfer to the hospital network (PACS). In addition, the image data of NaviVision can be stored via a USB interface.

The stand-mounted design of the infrared camera allows flexible positioning of the camera in the OR. Together with the flexible positioning of the navigation monitor, this makes NaviVision an extremely versatile system that opens up new possibilities through individual OR setups.

As a result, the clinical workflow is greatly optimized through improved sterility due to operation of the touchscreen directly at the operating table, and flexibility in surgical applications is greatly increased.

NaviVision offers the combination of a high-precision surgical navigation system from BrainLAB with the intraoperative imaging function of the mobile C-arms for ARCADIS Varic and ARCADIS Orbic as a 2D version and for ARCADIS Orbic 3D as a 3D version.

We see a way to reduce footprint by 20% and set up time by 30% with an integrated navigation system

With NaviLink to NaviVision

With NaviLink™, ARCADIS Varic and ARCADIS Orbic / Orbic 3D offer a direct interface for 2D and 3D navigation. This special interface combines the intraoperative 2D / 3D imaging of a mobile C-arm with high-precision surgical navigation.

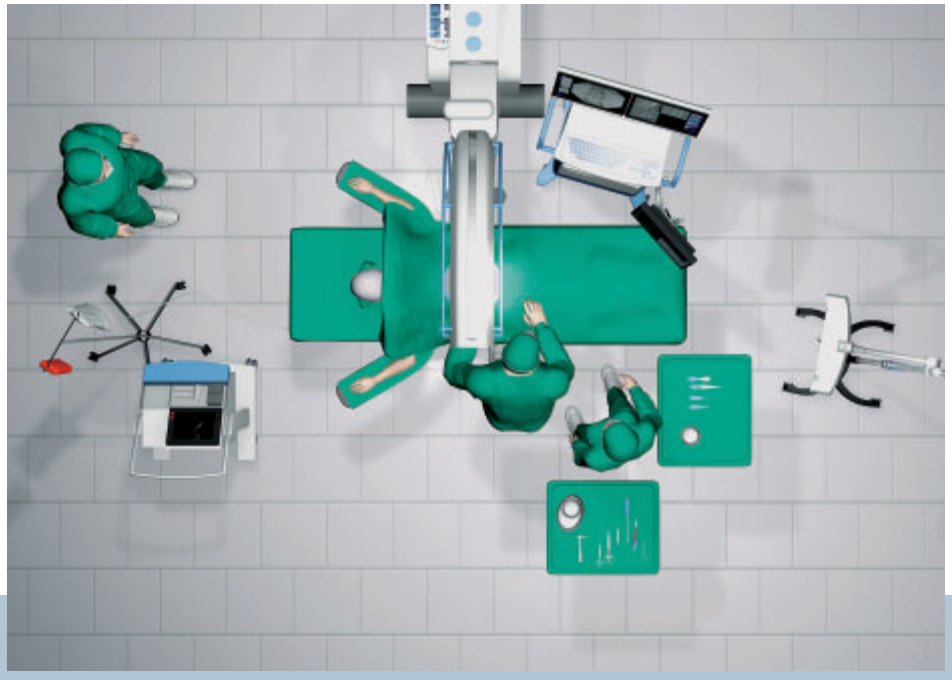
For intraoperative 3D imaging, ARCADIS Orbic 3D also allows 3D imaging in the OR in the true patient position, which makes the acquired 3D image data ideally suited for direct surgical navigation. The image data are provided with the corresponding spatial coordinates and transferred directly to the navigation system. As a result, manual matching of the anatomy to the 3D images is no longer required. This improves the surgical navigation accuracy and significantly optimizes the clinical workflow.

Moreover, 3D image data acquisition can be repeated as often as necessary to take into account any anatomical changes which may occur in the surgical field during surgery. By offering excellent 3D image quality and automatic navigation registration, NaviLink and ARCADIS Orbic 3D provide new clinical advantages and have likely set a new standard in surgical navigation.

Unlike other 3D imaging systems that can be used in the OR, ARCADIS Orbic 3D allows virtually unlimited access to the patient without extending the preparation time or increasing the complexity of the surgical procedure.

With NaviVison as the first integrated optical navigation system the proven clinical benefits of NaviLink are set to a new dimension: Through the integration of a navigation system and a C-arm, NaviVision combines two worlds which from the point of the surgeon's view had to grow together: intraoperative imaging and navigation of surgical instruments.

Navigation with NaviVision



Exemplary OR settings with NaviVision compared to conventional C-arm based navigation

Pelvis – example: SI screw fixation with NaviVision

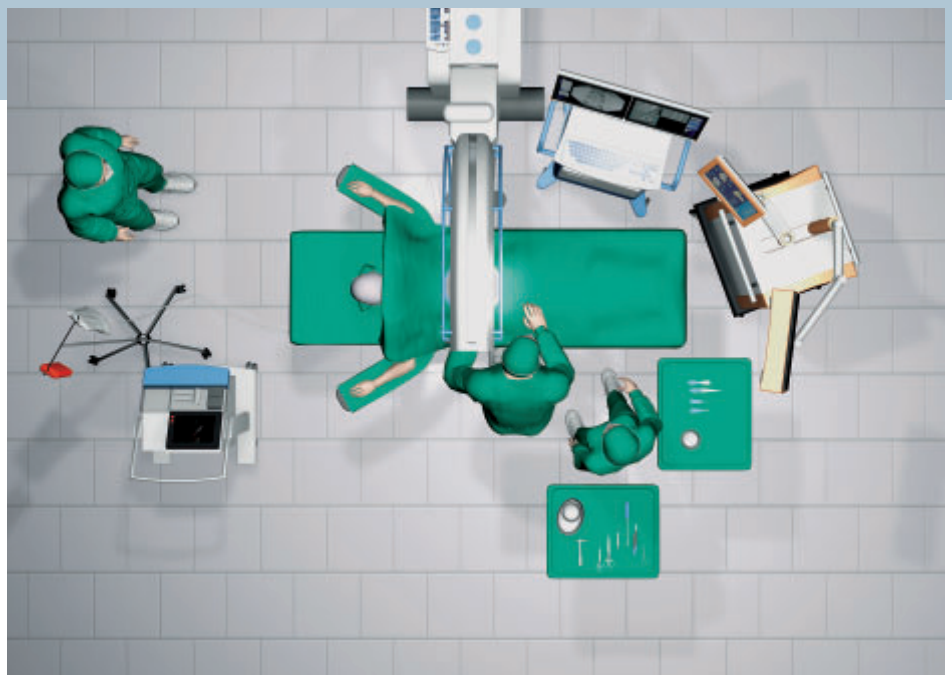
OR setting:

- The navigation monitor is attached to the monitor trolley of the C-arm and can be operated either by non-sterile OR staff or sterile by the surgical assistant.
- The camera is positioned at the foot end of the table and covers the entire field of view above the table so that all navigated instruments as well as the marker ring on the image intensifier are visible.

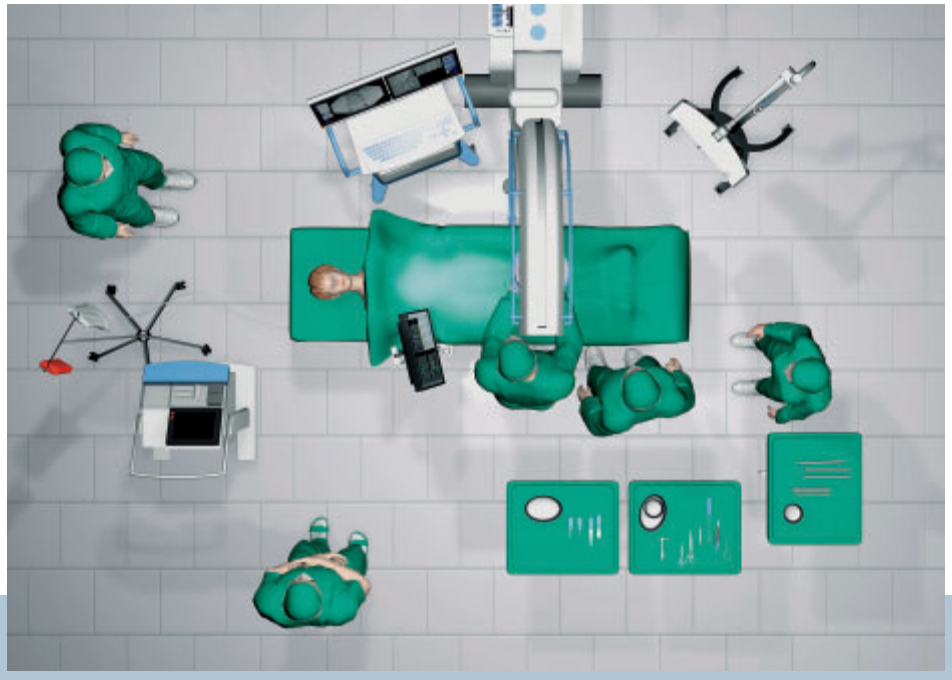
Conclusion:

This example clearly shows the reduced space requirement compared to the corresponding setting with a conventional navigation system.

Conventional C-arm based navigation



Navigation with NaviVision



Exemplary OR settings with NaviVision compared to conventional C-arm based navigation

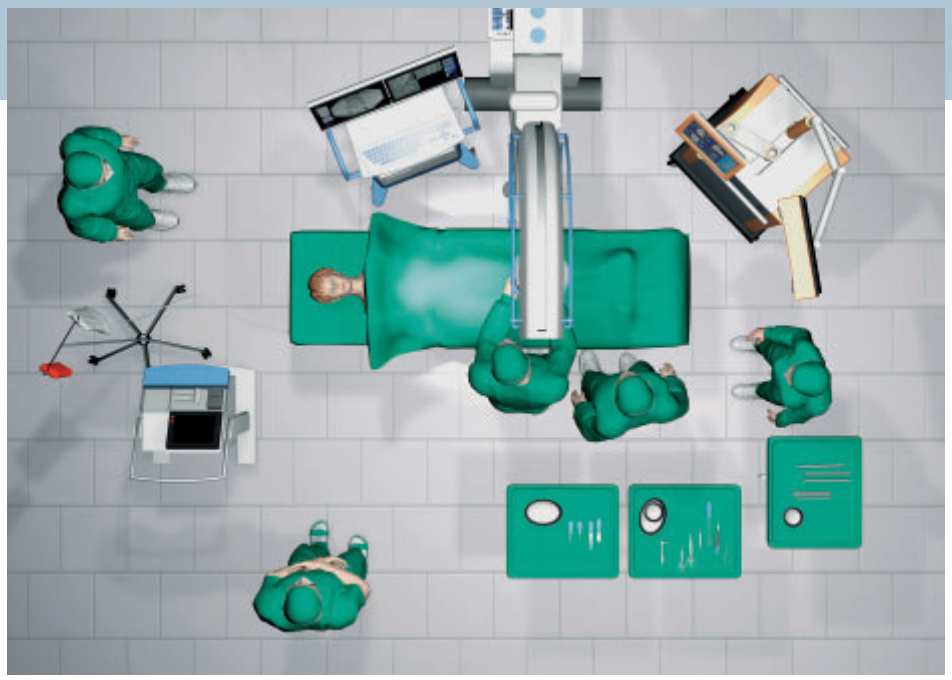
Lower extremities – example:
Tibial plateau fracture with NaviVision

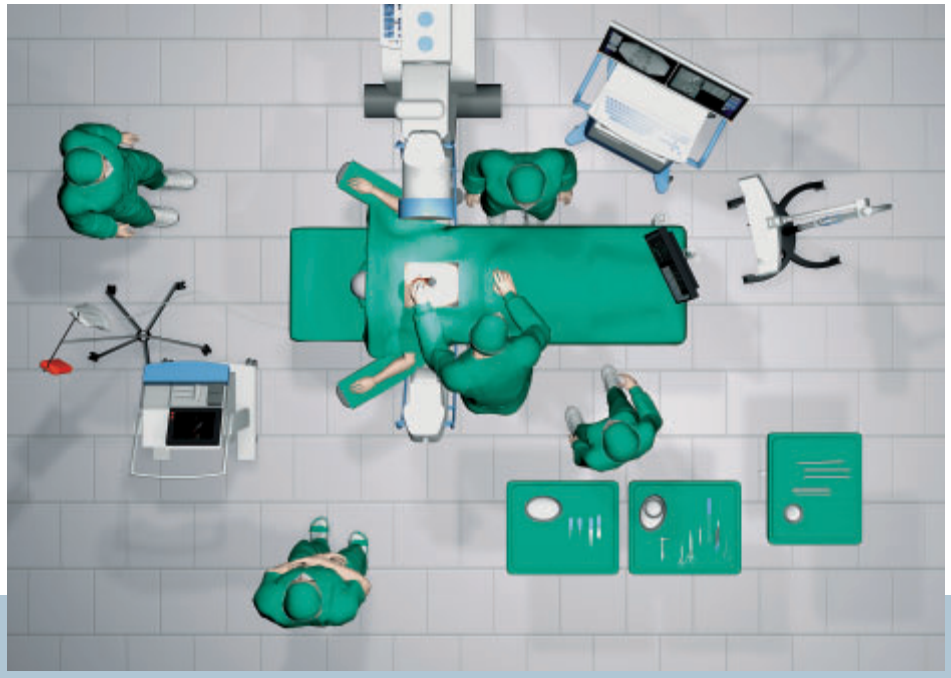
OR setting:

- In this case the navigation monitor is mounted (sterile) to the OR table and can be operated directly by the surgeon.
- The infrared camera is positioned next to the C-arm and covers the relevant surgical field including the marker ring of the image intensifier.

Conclusion:
This example clearly shows the flexible user concept (operation by the surgeon directly at the OR table) and the reduced space requirement compared to the corresponding setting with a conventional navigation system.

Conventional C-arm based navigation





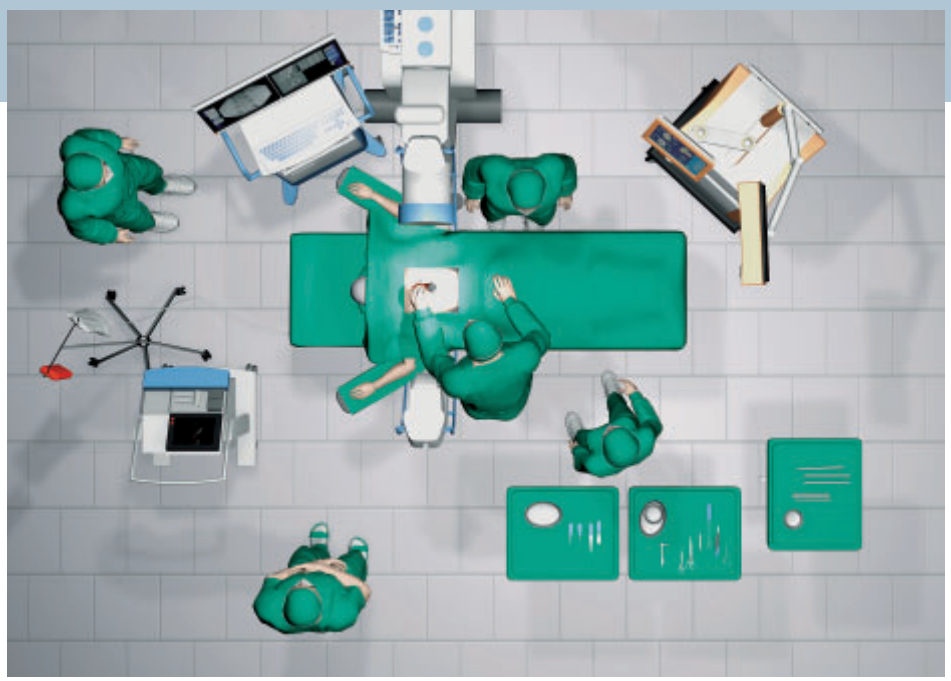
Thoracic/lumbar spine – example: Pedicle screw fixation in the case of trauma at Th 8 with NaviVision

OR setting:

- In this case the navigation monitor is mounted (sterile) to the OR table and can be operated directly by the surgeon.
- The camera is again positioned at the foot end of the table and covers the entire field of view above the table so that all navigated instruments are visible.

Conclusion:

This example clearly shows the flexible user concept (operation by the surgeon directly at the OR table) compared to the corresponding setting with a conventional navigation system. The reduced space requirement of NaviVision provides the assisting surgeon with greatly increased freedom of action.



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