

## Innovating in Surgical Imaging



*Dr. Shivaji Basu, Chief Urologist, Wockhardt Hospital & Kidney Institute in an interview with eHEALTH speaks about innovative solutions for Surgical Imaging.*

**Q. How do you see technology advancing in Operation Theatres (OT), the core competency area of a speciality hospital?**

A. Advancement in the OT infrastructure in terms of structure, such as edgeless OT rooms, pendant systems, OT tables / OT light and surgical equipment have definitely improved the efficacy of the procedures and provided the best opportunity to apply surgical skills.

Minimal access surgeries (MAS) and endoscopy diagnostic procedures have revolutionised the operating procedure that uses various endoscopes for different body parts. MAS involves lower risk in terms of blood loss and infection and drastically reduces complications in post-surgical recovery/medication.

As the procedures are getting more sophisticated, need to document the procedural details is naturally perceived strongly. Imaging has emerged as a core part of procedure documentation in the recent past. The subsequent sections explain its benefit to service seekers as well as providers and other stakeholders.

**Q. How do you see Information Technology in particular, utilised in the Operation Theatres?**

A. In a Super speciality Healthcare facility like Wockhardt Kidney Hospital and Urology Centre, we stress upon the best surgical practices and institutionalisation of optimal treatment protocols. Many of the Pre-OP details such as preparations, kits and material, and intra-OP events, are documented in the HIS system; the documentation of actual surgery has always been a challenge. Our experience over the past few years is worth sharing in terms of how imaging has revolutionised the procedural documentation.

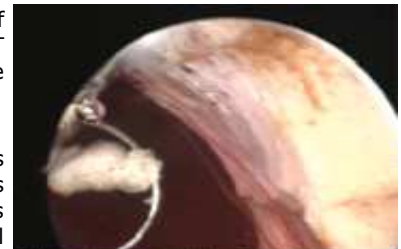
We have digitally recorded 7000 Urological procedures over the last 3 years for 3 Urology OTs and the data is archived centrally in the imaging server. When we were looking out for an appropriate solution for OT imaging a few years ago, we realised that the conventional approach, better known as PACS, was not suitable for our need. We therefore decided to implement 21st Century Advanced Imaging System in 2005.

Endoscopy, C-arm, Lithotripter and other modalities are not covered in the scope of DICOM services. DICOM services predominantly focus on radiology imaging needs and workflows. They also cover Cardiology, Nuclear Medicine and Radiation therapy equipment in detail, however, imaging and movies of the surgery is an entirely different type of data.

**Q. But most of the PACS systems do capture non-DICOM data using video grabbers and subsequently make it DICOM-ready to be a part of PACS.**

A. You have raised a valid point. Almost all PACS vendors claim this. But it is done in such a way that it 'fits in' the conventional PACS for storage. It only adds DICOM overheads without providing any specific advantage to the users, such as a surgeon like me.

For example, the most important thing for surgical recording is a movie clip. Most of the PACS workstations do not have the capability to handle movie compression, editing and other basic processing. So we work around this to store this data, which is known as 'secondary captured' images.



TUR prostate - documentation of end point



C-arm imaging - documentation of pathology



Endoscopic view of prostate - a document



Laparoscopic removal of donor kidney

**Q. Wockhardt Kolkata is one of the first institutions in the country to implement such a solution. Can you please tell us how it has benefited the institution?**

A. The first thing that comes to my mind is that the entire surgical recording is available to us today and we do not miss out on any case. It has generated a huge data bank for us for research. We regularly index the data and prepare presentations for conferences and CME initiatives.

We have participated in many conferences so far, and over last two years, the time taken to prepare a presentation from scratch is reduced from 5 days to 3 hours, purely because of efficient archival and retrieval. We often have to speak for a short time and it is necessary that we have a movie clip precisely demonstrating the clinical aspects! Earlier we needed help from a graphics expert and it would be a nightmarish experience to adjust time for the activity. Now we are self-sufficient and our users can do everything that was outsourced earlier and in a fraction of the time it took before.

We have a discharge summary module integrated with imaging and it has been a standard norm to educate the patient through intra-OP images. We decided to allocate a separate terminal for preparing daily discharge summaries connecting to Advanced Imaging server. Patients are becoming more and more aware and appreciate this additional information about themselves. We also use images for actively counseling the patients during pre-procedure and postoperative sessions. Diseases like Bladder Tumour, which needs repeated endoscopic monitoring is a good example. Patients keep a copy of the details of the tumour on a CD with the final analysis of the treatment. This CD is updated every time the patient has a checkup. We can get hold of some very similar cases and discuss risk factors and success stories openly with the patients. Medical jargon is always a hurdle in communicating to the patient, in which case images speak for themselves and are a very effective counseling tool.

But in my opinion the biggest advantage is that we have introduced best clinical practices with self-evaluation and reviews. Whenever necessary, we review the data on-line or retrospectively. We realised that the turn-around time of the OT can be improved by identifying bottlenecks during the review. We could also review the procedures within the team and always learn a few new things.

Another very interesting byproduct is the computer motivation amongst the OT staff and the technician. Almost everybody now is computer savvy or at least taking enough interest in computer education.

To conclude I would say that OT imaging is the last bastion and all we need to conquer this to change mindsets and adopt digitisation completely. The benefits are too many to be ignored.

Picture archival and communication traditionally was considered only for Radiology. Cardiology and Nuclear medicine extended the horizon. Clinical or summary image distribution systems took the benefit to clinicians. Surgical imaging is a late entrant to ICT integration. Partly because of the sterile environment which gives very little flexibility for access and usage. Partly because of the mindsets of the OT users, and partly the need for innovations from imaging solution providers.

This unique solution by 21st Century Health at Wockhardt Hospital & Kidney Institute, Kolkata would not have been possible but for Dr. Shivaji Basu and his team of surgeons' enthusiasm and conviction about ICT and their invaluable contribution in terms of user feedback for enhancing our first-of-its-kind OT imaging system. The wholehearted support to the initiative by the top management was also key to its success. ■

"OTs are the hub of excellence and knowledge centres for the hospital. ICT benefits must reach surgeons. Imaging will play a key role in the efficiency and outcomes of surgical processes and the documentation of critical data from the OT's will also leverage accreditations.

Adapting to digital culture in OT's has always been a challenge, but our team in Kolkata has demonstrated that IT cannot remain isolated from OT's any more. OT imaging is a part of Patient Health Records in a broader sense and our goal is to implement full-fledged PHR next."

**Vishal Bali**  
**CEO, Wockhardt Hospitals**

"I am confident that with positive attitude of clinical users & foresight of management, innovative solutions can get implemented successfully in India. We hope more and more hospitals take a message home. We at 21st Century are confident that our innovative solutions in advanced imaging will completely change the perspective about traditional PACS and we will see more and more innovative products emerging from India."

**Aniruddha Nene**  
**Principal Consultant Imaging and Director, 21st Century Health Management Solutions**