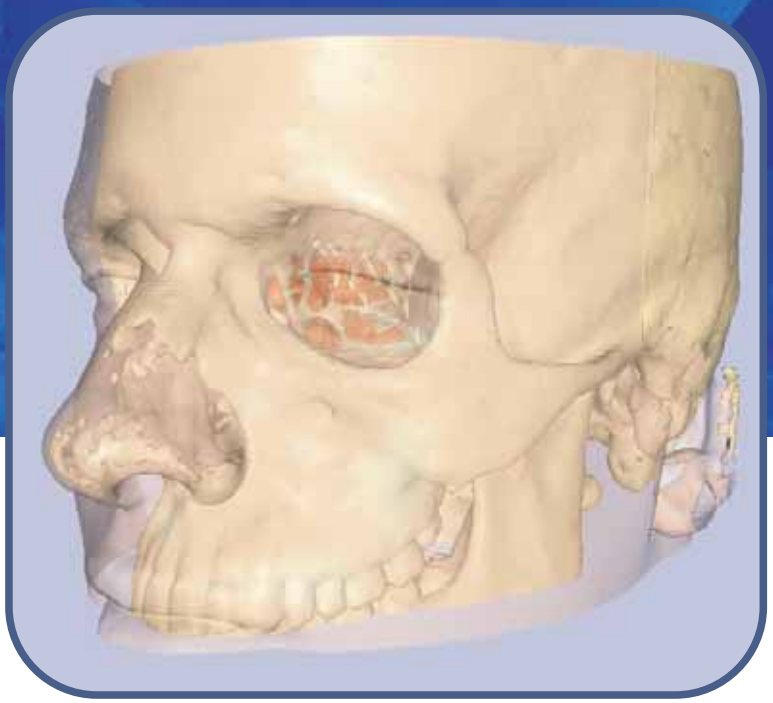
TRUE LIFE ANATOMY



ADVANCED INTERACTIVE 3D IMAGING

PRODUCTIVITY / FLEXIBILITY / DELIVERY/ WORKFLOW EFFICIENCY

TRUE LIFE ANATOMY

PRODUCTIVITY / FLEXIBILITY / DELIVERY/ WORKFLOW EFFICIENCY

The need

To optimise patient care delivery, the clinician needs good diagnostic imaging. The Imaging service can provide the ordering clinician with an appreciation of the patients 3D patho-anatomy by providing:

- Interactive 3D image access
- True and accurate measurements
- Perspective of injuries from 360˚ view
- Range of image delivery options

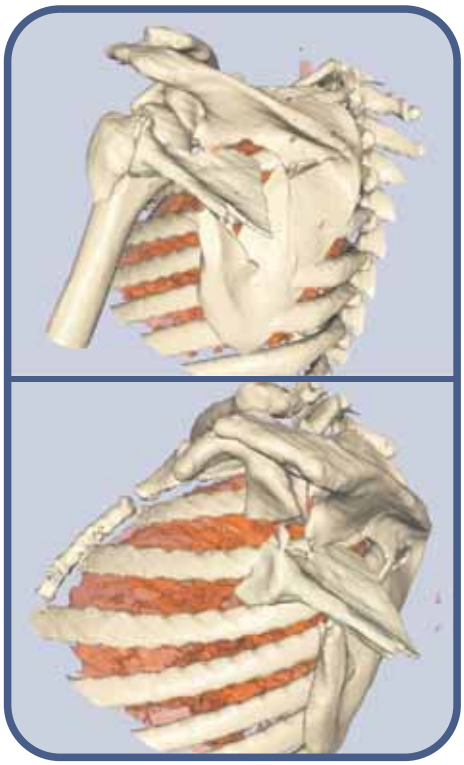
The problem

Current volume rendering 3D imaging programs can only deliver 2D screen captures to the clinician nice pictures of the 3D data set, but of limited usability to the clinician. Even with thin and thick client capabilities, the clinician cannot truly manipulate the image and it is expensive to set up.

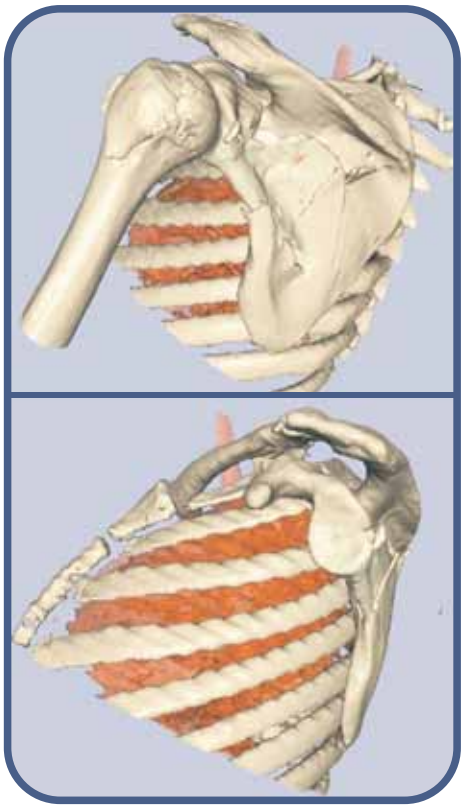
The solution

Using advanced Surface Shading Technology, True Life Anatomy delivers truly interactive 3D image access to the clinician. This is actual 3D image sharing, in a DICOM compliant, PACS compatible, WEB accessible PC based environment.

True 3D interactive capability within a cost effective and accessible format with the capacity for virtual surgery, arthroplasty templating and patient instruction - this solution is market desirable, economically attractive and a sound investment to compliment existing imaging capabilities.



GLENOID FRACTURE - PRE OP



GLENOID FRACTURE - POST VIRTUAL REDUCTION

Current situation and limitations:

Most current 3D CT imaging programs use volume rendering (VR) technology. While this provides outstanding direct visualisation of the 3D data set, and can effectively display soft tissues there are limitations in sharing and modifying this image.

The value to the clinician is limited as the parts of the image cannot be individually manipulated or moved. This is because VR only displays the individual data points, which are given variable colour and transparency to simulate a 3D image - a type of hologram.

The direction of view within the 3D image can be changed, and "apparent segmentation" is achieved in VR by hiding contiguous voxels in the ROI (Region Of Interest). However, since this technique does not create an actual 3D object, parts of the image can be hidden, but true segmentation is not possible. No 3D object no segmentation.

Each viewing of the simulated VR 3D image requires fully rendering the entire data set, and thus interacting "live". Thin and thick client capability increases the functionality of this technology, but there is only ever a 2D output as there was never a 3D object.

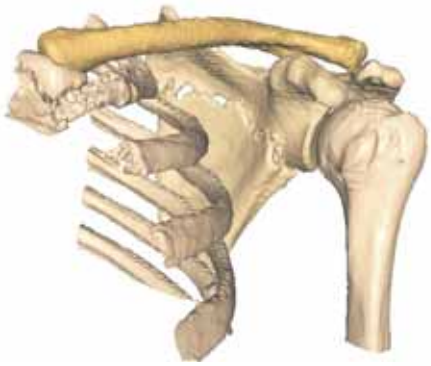
What is the alternative?

By harnessing and developing the capabilities of Surface (threshold) Rendering (SR), True Life Anatomy has created a suite of imaging tools that create a true 3D object and crosses this image-sharing impasse. Using thresholding of the scan data points, a surfaced geometric 3D object is created, and it is this object that can now be saved. Multiple objects can be created from the same data set to visualize skin, muscle and bone, and then be saved as a single 3D object. Using an array of graphics tools, individual components in the object can be segmented to allow true 3D interactivity and manipulation.

What is True Life Anatomy?

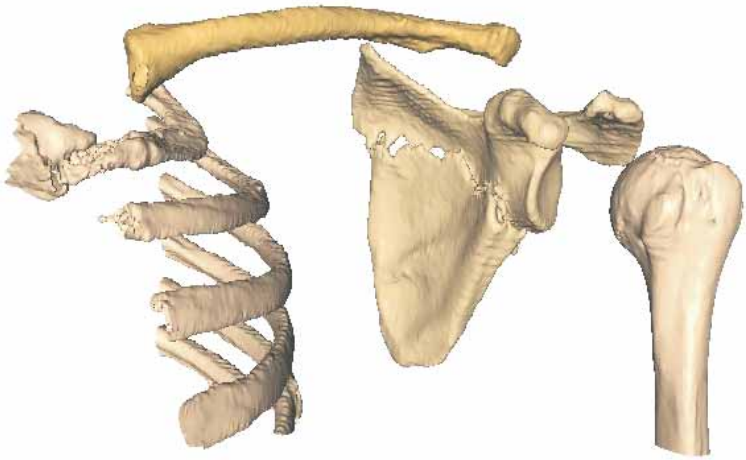
True Life Anatomy (TLA) is desktop software that provides interactive access to real-time 3D, animated images of a patient's injury at the bedside, in the clinic, or even in the operating theatre. TLA combines state-of-the-art, 3D animation tools that are typically used in video animation applications, with conventional anatomical imaging (CAT scans) to give a real-time view of bone and surrounding tissue. For the first time, radiologists and clinicians can conveniently view an injury and manipulate the image on a standard desk top computer to show a patient or a medical team accurately what has happened and what is being planned.

TLA represents a significant advance on existing imaging technology, which previously was restricted to dedicated CAT scanner high-powered workstations in a radiology facility. TLA requires only a current desktop and no specialised skills.



How is TLA different?

Unlike most of the popular 3D imaging software used today, which in reality can only produce a 2D picture the 3D data, TLA creates a true 3D object that can be manipulated, segmented and modified.
Try asking your current software provider to do this!!



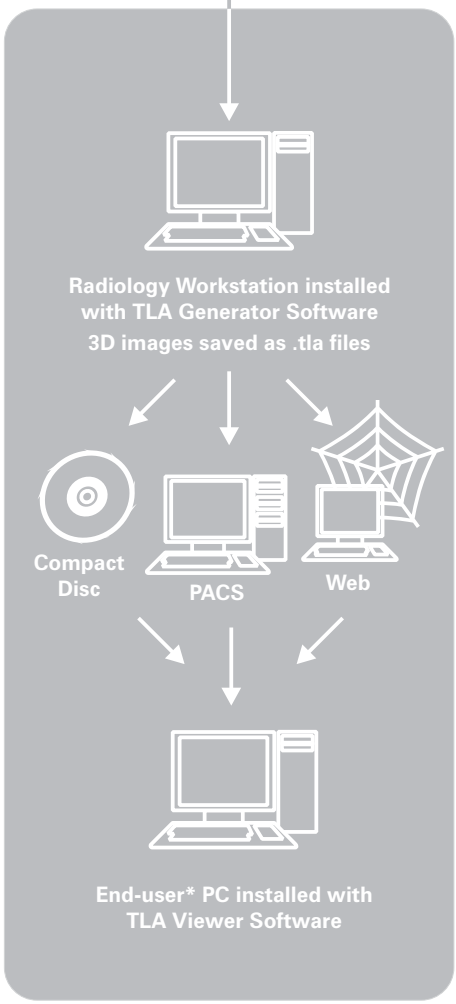
Why would you want to do this?

This indicates that an actual 3D object has been created that can be manipulated, saved and sent to the referring clinician not just the 2D image of the 3D scan data that most software can provide. The Radiologist or Technician does not need to guess the relevant view or orientation required. The referring clinician can select the required view as the 3D image can be reviewed and manipulated remote from the radiology department on their own PC. Such functionality can be used for:

- Improved diagnosis
- Virtual surgery and trial fracture reduction
- 3D arthroplasty templating
- Patient demonstration and education
- Research and teaching

TLA software is designed to complement and add functionality to existing 3D imaging packages by providing actual 3D models to the clinicians PC to allow interactive viewing and accurate patho-anatomical assessment and measurement.

CT / MRI



TLA is the solution for Diagnostic Image delivery

TLA technology empowers the radiologist or diagnostic imaging service with a capability to create a true 3D object from scan data, and to save that object in a DICOM compliant, PACS compatible format and send it to the referring doctor on a CD, via a network or over the web. This is functionality unavailable to film or current PACS delivery of 2D images and this translates to:

- the capability for the clinician to readily access and view the 3D object on a simple viewing interface (TLA Viewer),
- the ability to share the actual 3D image with the referring clinician for the unprecedented functionality to view, diagnose and plan the clinical problem within an interactive 3D environment, with
- the option to further segment or manipulate the image using 3D object manipulation software (TLA Generator).

True Life Anatomy technology features

Referral Market attractive
True 3D image sharing with the referring doctor
Clinically compatible format
Accessible for patient instruction
Specially designed clinician friendly interface

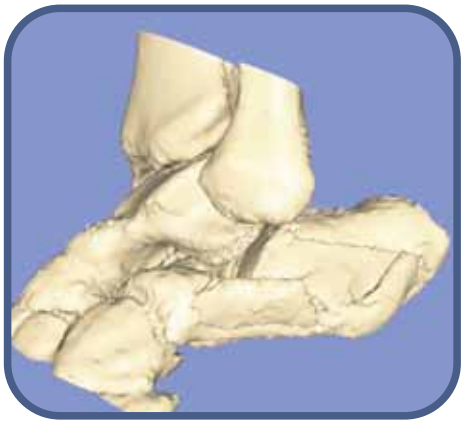
Requires modest investment
PC based
Economical software
Minimal technician up-skilling required

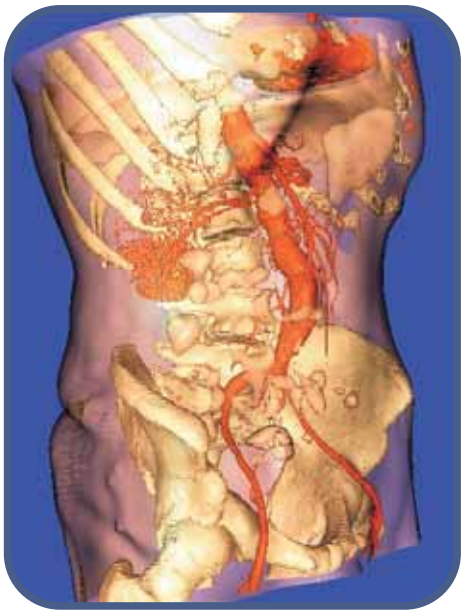
Existing Network compatible
PACS compatible / DICOM Compliant
3D files can be saved as TLA format (.tla) or DICOM (.dcm)
No specific additional networking requirements
Compresses slice data to facilitate storage

Web capable
File compression and integration allows online access
Allows remote access to referring clinician
Configured to allow secure download facility access

Expanded Clinician capability
Secondary object manipulation using TLA Generator
Virtual surgery
Trial fracture reduction
Arthroplasty templating
Patient instruction
Portability of data
PC based and thus economical installation

Radiological empowerment
Better and interactive 3D image provision
Control of the initial image creation
Improved image access on network and PACS
Embedded export file format





Advantages for the Radiologist:

Modest investment means a predictable return on investment. Because of the increasing numbers of slices generated from multi receptor slice scanners, it is becoming difficult to review adequately the entire data set. The larger numbers of slices have advantages such as:

- Better MIP
- Reformats
- 3D image creation

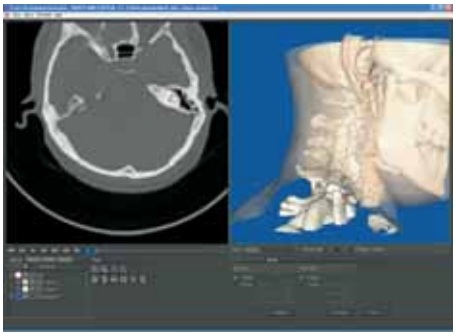
The large slice number however creates problems such as:

- Large data set memory issues
- Storage
- Slice sharing and presentation
- Large file size for export to referring doctor

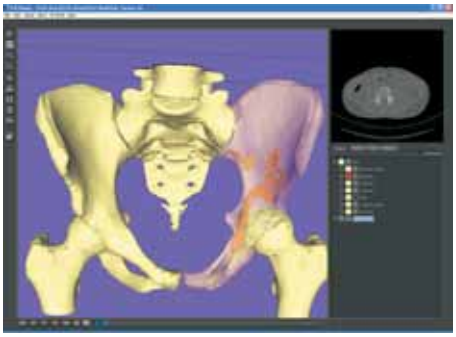
TLA makes the most of the large number of slices to create a high quality 3D image that is then decimated to usable and visually adequate size. This maximises the usefulness of the fine multiple slices, but then packages the data in a usable form. Volume averaging issues are reduced by the thin slice overlapping slices maximising the option of creating an automatically segmented image. When saved to a tla or DICOM format, there is integration of the 3D and 2D image information for ready reference.

TLA software provides significant advancement to your current imaging capability by making the most of the data creation, by providing the referring clinicians with an attractive imaging capability, and by allowing post processing to be done by the people who are most aware of the clinical requirements the referring clinician.

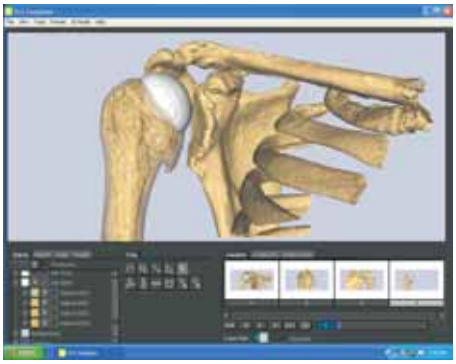
- Virtually all diagnostic imaging is ultimately paid for by the patient (including through their taxes or insurance), as these studies are an essential part of their medical care.
- Those patients typically give their clinician the responsibility to order the most appropriate investigations to achieve this outcome.
- True Life Anatomy Technology empowers the radiologist to provide the most effective display of such imaging data and delivers to the clinician the capability to make the most of the diagnostic studies to improve the management, education and outcome of the patient.
- Providing true interactive 3D image access imparts an increased diagnostic and therapeutic capability that film cannot offer - creating enormous advantages to digital image data access and facilitating the move to film-less in a way beneficial and essential to the referring clinician.
- True Life Anatomy Technology improves the accessibility of diagnostic imaging data to the patient treatment axis, and as such this benchmark capability may become an expectation by the referring clinician.



TLA GENERATOR



TLA VIEWER



TLA ANIMATOR

TLA Software:

TLA Generator
Reads in raw CT-Data and converts to surfaced models and generates the .tla file format and can be converted into DICOM format. It allows for individual control of creating separated segments, or automatic functions for best guess segmentation and permits separation of component parts of the object and can delete parts of the objects as well as accurately measure distances and angles. There are two versions:

1. The Radiology Suite allows network reading capability, archiving, report creation and export option to maximise workflow capability within a PACS or general radiology environment.

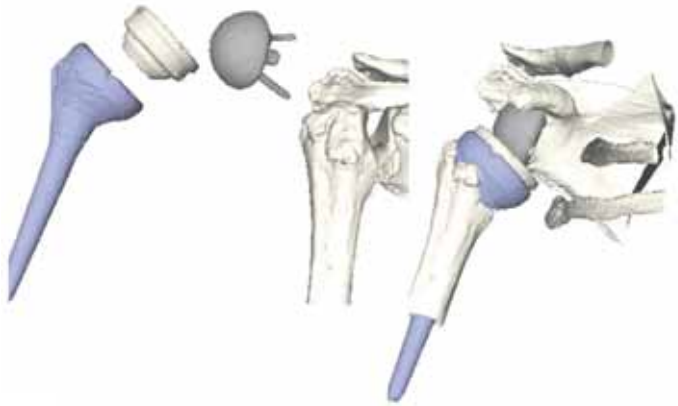
2. A desktop version is available for the clinician to perform additional post processing of the object, but with limited import capability, and report generation or modification functionality.

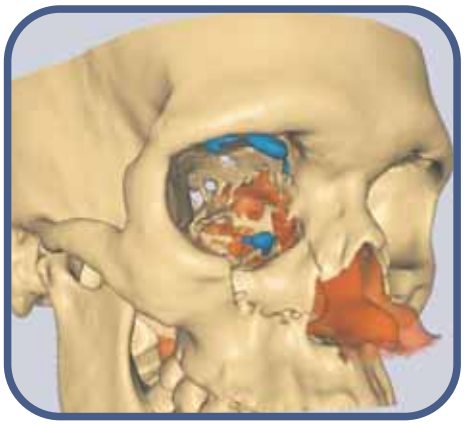
TLA Viewer
The viewer reads the .tla files created by the TLA Generator software and saves them to standard .jpg file format, or prints report. It can hide (previously segmented) objects or segments, and colour objects or segments. It can run on most standard desktop computers, and has a simple and intuitive interface.

TLA Animator / Templator
The TLA Animator generates animation files by reading in .tla files with options to:

- Move individual segments of a 3D image file such as for a trial fracture reduction,
- Import sequential positions of a joint to create an animation to demonstrate motion, or
- Import the anatomical file plus a virtual prosthesis to trial a joint replacement.

Both the objects and the virtual camera can by moved in 3D space. This technology allows virtual surgery, arthroplasty templating and multiple joint position motion simulation.





True Life Anatomy Pty Ltd
Greater Union Centre
128 Hindley Street
Adelaide SA 5000
Australia
www.truelifeanatomy.com
tla@truelifeanatomy.com

True Life Anatomy Software is available
exclusively through RuBaMAS Pty Ltd
www.rubamas.com

24 hour help line:
Tel: +61 8 8239 8126
Fax: + 61 8 8221 6766

Purchase enquires:
www.rubamas.com
info@rubamas.com

Technical Support:
info@rubamas.com

Medical Application Support:
clinical@truelifeanatomy.com

Awards:

Consensus Software Award winner 2003
Secrets IT Innovation winner 2004
Best Scientific Exhibit ASSH 2003
ASSH Representative AAOS 2004
Best Paper AHSS 1999, 2000
Best Paper AHSS (SA) 2002
Aust Health Industry Award 2004

TLA technology has been presented at:

Mayo Clinic Wrist Course, Rochester MN, USA 2004
Roentgen Ray Assn AGM, Florida, USA May 2004
Stryker Trauma Meeting, Queenstown, N.Z. 2004
Int. Congress for Surgery of Shoulder, Washington, 2004
Duke Hand Club, Lake Como, Italy 2004
IFSSH, Istanbul, Turkey 2001
IFSSH, Budapest, Hungary 2004
ASSH, Phoenix, US 2003
ASSH / BSSH, Cambridge, U.K. 2003
Oxford Hand Society, Oxford, 2004
APLAR, JeJu Island, Korea, 2004
NZOA COE Napier, N.Z. 2003
ISAKOS, Auckland, N.Z. 2002
Western Pacific Orthopaedic Assn, Adelaide, 2003
Piedmont Society, Durham, NC USA 2003
Aust O.A. AGM Brisbane 2002
RACS AGM, Adelaide, Aust. 2002
AHSS, 1999, 2000, 2002
NSW Hand Surgery Society, Canberra, Aust 2004