

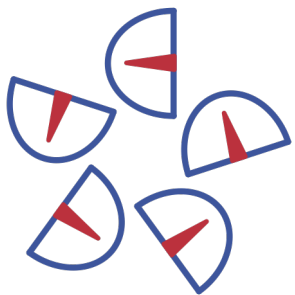
CLAP Snaps

5 Key Messages

Perioperative Transoesophageal Echocardiography

Thursday 30th September 2021

www.CardiothoracicAnaesthesia.com



TOE – Teach and Learn

Prof Justiaan Swanevelder
(University of Cape Town)



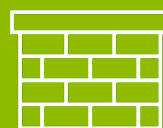
Everyone has to start somewhere!

From humble beginnings as adapted endoscopes, TOE is now a standard of care for cardiac and aortovascular procedures



Keep Going!

More practice will help you get over the fear of echoing, allow you to take more satisfaction from it and TOE will soon become second nature



Get the basics right

Concentrate on getting all views at upper- and mid-oesophageal, and gastric levels

2

Courses and Friends!

Organise courses, attend courses, talk to others interested in echo. It's the only way to push boundaries!



Always do a full exam!

- Increases practice while learning
- More exposure to anatomy
- Baseline for later comparison
- Unexpected findings

Smashing the Video Cases

Dr Stephen Shepherd (St Bartholomew's Hospital)



1

Choose cases wisely

1. Don't use incomplete studies
2. Don't use poorly echogenic subjects
3. Make sure your loops are good:
 - 1-2 beats
 - Don't sample after an ectopic
 - Try to avoid sampling during CVS instability

2

Optimise your images

Make sure the ECG is connected!!!

Check your
-depth
-gain
-focus

3

Dopplers

Focus your signal to the area of interest

Optimise the scale for the signal
(40-60cm/sec generally)

Set the sweep speed to 75-100mm/sec

Include the measurement!

4

What are the examiners looking for?

Reports judged on completeness and accuracy

Errors in interpretation or omission?

Must include a summary that can be interpreted by a non-echocardiographer

5

Easy wins

Systematic approach to reporting

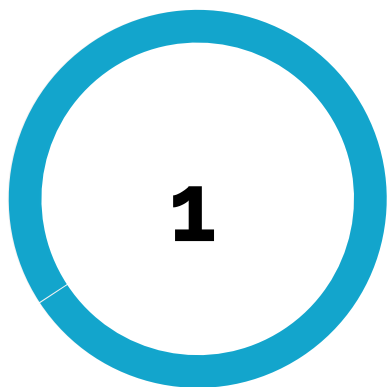
Write something for every chamber and structure

Measure what you can measure (and don't measure what you can not measure!)

Ensure measurements match the images

Off Piste TOE & A Few Tips

Dr Sue Wright (St George's Hospital)



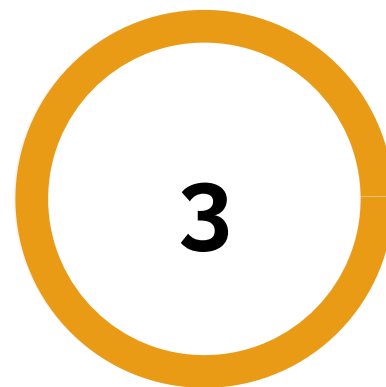
Know what's happening at the probe tip at all times when you move and manipulate the probe – HeartWorks shows the movements of the tip as you obtain various views

Understand your probe



Understanding anatomical relationships of structures allows you to move between views in order to fully image and explore your target structure

Know the anatomy



Centre the structure of interest on the screen so that when you rotate the omniplane the structure will still be centred

SAX and LAX are orthogonal



If anatomy is distorted or a view is unavailable, structures can be viewed via alternative windows to get a complete assessment

Structures can be seen in multiple views



Understanding surgical techniques and potential complications can help recognise issues early and improve patient outcomes

Watch what the surgeons are doing

3D TOE Basic Knobology

01 Trade-Offs

3D TOE requires finding a workable balance between temporal resolution, spatial resolution and sector size, all of which are inter-related

02 Understand the Physics

By understanding how 3D TOE images are created, we can optimise images with better centring and manipulation of images and appreciating the pyramidal section of the 3D sampling volume

03 CICO

Crap In = Crap Out!

3D modes will not magically make your por 2D images into amazing 3D reconstructions... Make sure your 2D images are optimised

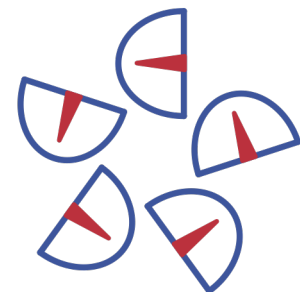
04 3D Modes

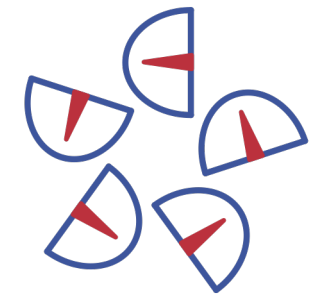
Live 3D imaging gives good temporal resolution but at the cost of spatial resolution, Multibeam reconstructions have superior spatial resolution but are not live and can suffer stitching artifact.

05 Imaging Large Structures

For imaging big structures such as the LV, we can use Large (GE) or Full Volume (Philips) although temporal and spatial resolution suffer as we increase the simple volume size.

Watch Carlos's presentation in our Member's area to see his tips for which controls to use!





TOE for VAD and Transplant

Dr Antonio Rubino (Royal Papworth Hospital)



What to Look For Pre-VAD

Intra-cardiac shunts
Aortic valve
Aortic dilatation
Mitral Valve
TR v. common
RV
LV



VAD components

- Check inflow cannula is aligned to the LV inflow tract with MV opening
- Ensure Outflow cannula is not obstructed

1

Pre-Heart Transplant

Confirm diagnosis
Look for thrombus in the heart
Look for pleural effusions.

2

Post-Heart Transplant

-LV and RV function
-MR due to distortion by atrial anastomoses
-PFO
-Anastomoses (aorta, OA, PV/Atrial cuff, SVC & IVC)



Lung & other organ Transplant

Check pulmonary vein anastomoses

Other organ transplants TOE is only indicated for CVS monitoring

Complications of TOE: ACTACC National Audit

Dr Ganesh Ramalingam (Royal Papworth Hospital)



1

Sites of potential injury

1. Oral (teeth, lips)
2. Oropharyngeal
3. Laryngeal (cord trauma, airway compression)
4. Oesophageal (laceration, perf, false passage)
5. Gastric (laceration, perf, bleeding)

2

Absolute Contraindications

- Perforated viscus
- Oesophageal
 - stricture
 - tumour
 - perforation
 - laceration
 - diverticulum
- Active upper GI bleed

3

Pilot Study

- Papworth Hospital
- 13,400 TOE 2004-13
- 4 oesophageal perforations (0.029%)
- 11 lip/oral/dental injuries

4

Audit Data

- 22,297 TOE exams nationally in 2017 (~32,000 surgeries, 18 units)
- 12 Lower oesophageal perforations (5 deaths)
- 5 Upper GI bleeds (2 deaths)
- Overall major GI complication risk **0.08%** (1:1300)

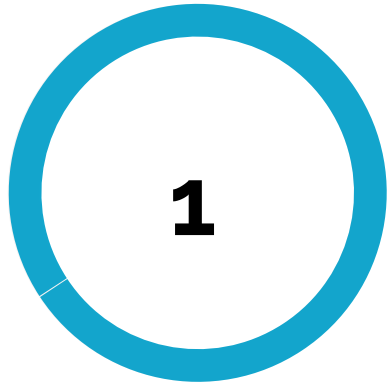
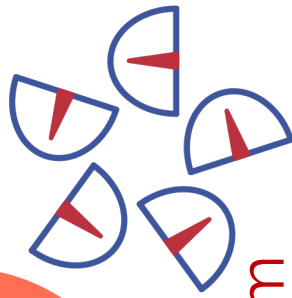
5

Conclusions

- TOE valuable tool – benefits may outweigh risks in complex patients
- Use of laryngoscope (or VL) may reduce risks of insertion
- TOE probe cover may affect flexibility of probe tip
- Hands on TOE courses and TOE sim to aid training

Management & Sequelae of Oesophageal Injury

Miss Cara Baker (St Thomas's Hospital)



90% barogenic injury (vomiting, retching), 10% underlying pathology

Left posterolateral distal oesophagus

Mackler's triad:
vomiting, chest pain, subcut. emphysema

Boerhaave's Syndrome



Diagnostic OGD 0.03%

Therapeutic OGD 2-5%

Anterior disc surgery

TOE, NGT

Risk of Iatrogenic Perforation

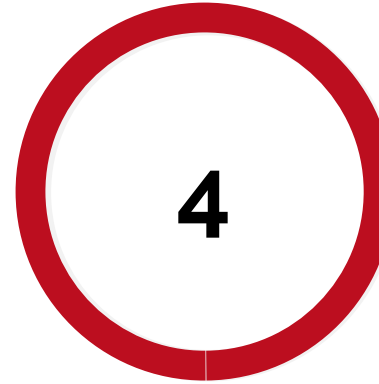


Early CXR may be normal

CT – pneumomediastinum, effusions

-Resuscitate, broad spectrum IVAB
-Avoid blind NGT
-Contact local OG service

Diagnosis & Initial Mgmt



HDU/ITU, IVABs, antifungals, PPI, nutrition

CT/endoscopy/contrast swallow

Surgery: locate perf, degree of contamination, neck/chest/abdo, +/- feeding jejunostomy & venting gastrostomy [or cons. mgmt]

Mgmt by OG



Deal with sepsis

Phone oesophagogastric surgeons

Find the hole

De-function and protect

Be prepared for reintervention

Summary