

Testing AEC of CT scanners - a snapshot on the current practice

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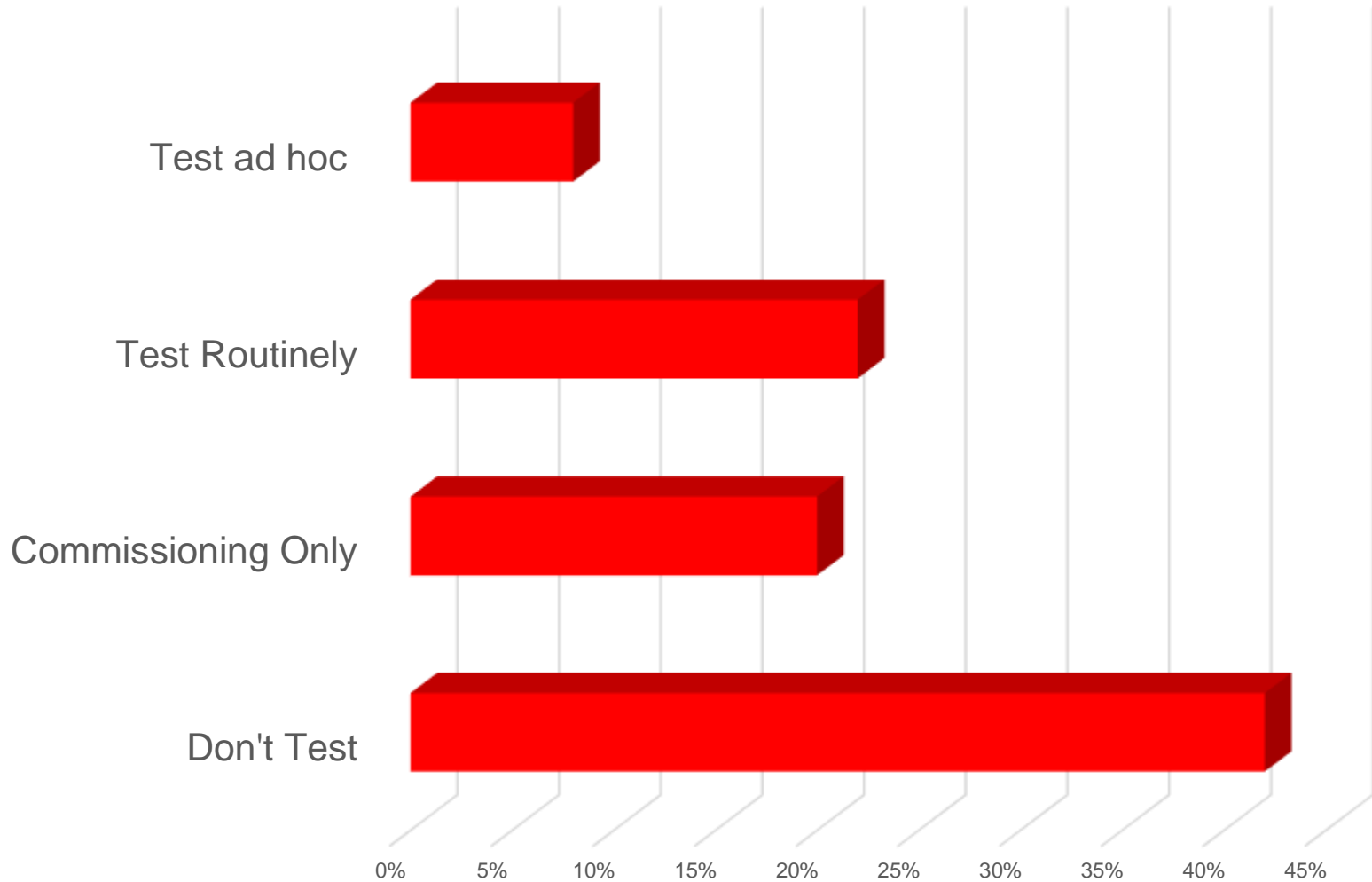
Background

- **Guy's and St Thomas not currently routinely testing CT AEC**
- **We have the 'CELT phantom'**
 - Use adhoc (projects and commissioning)
 - Not used routinely
- **Intending to implement into routine testing**
- **Concerns**
 - Manual handling
 - Time
- **Keen to understand status of CT AEC testing in UK**
 - Devised Questionnaire

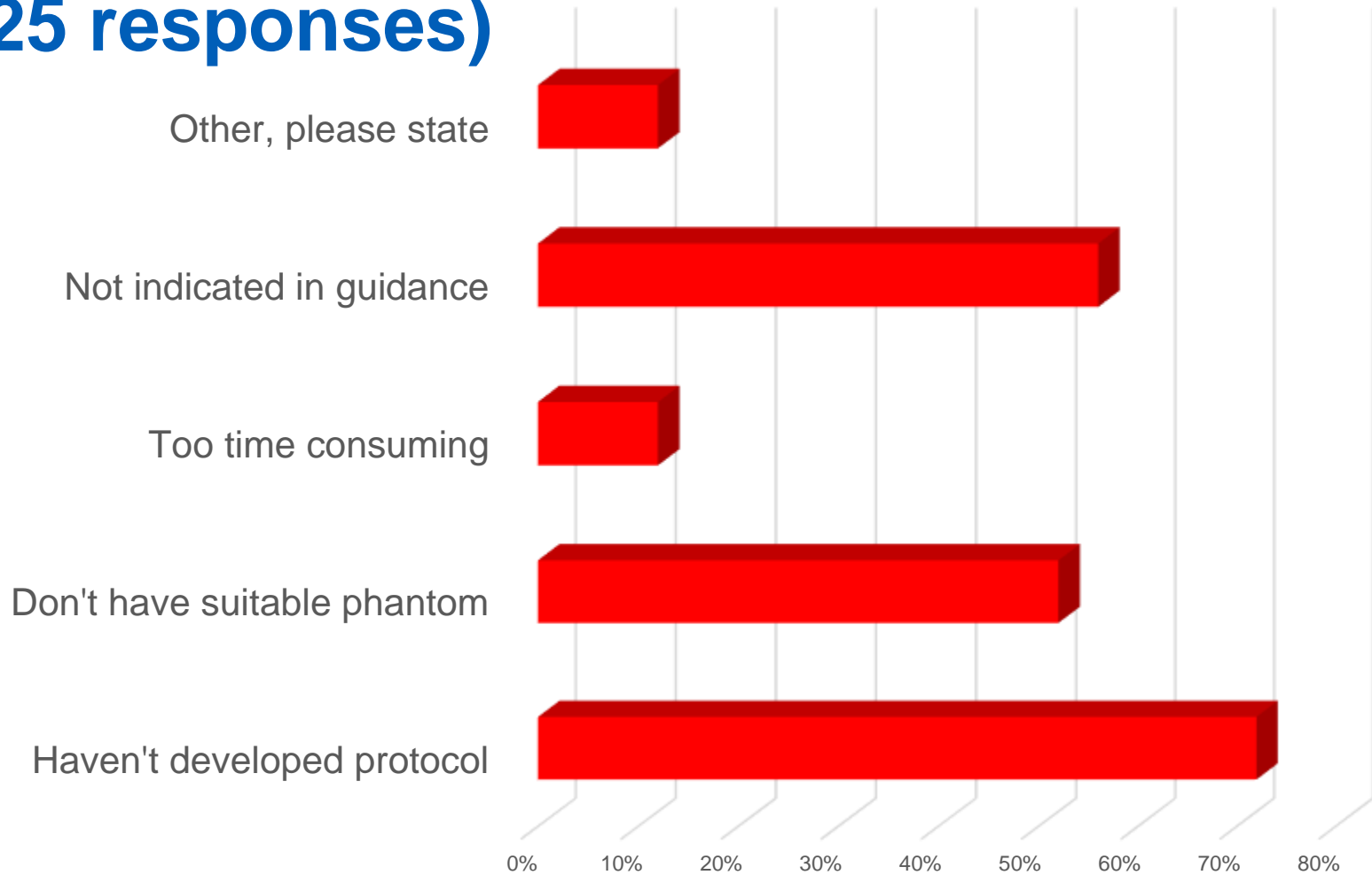
Questionnaire

- **Asked 6 Questions**
 - Do you test the automatic exposure control of your CT scanners
 - If you answered ‘don’t test’ please share reasons
 - When testing AEC what tools do you use
 - When testing the AEC what scan settings do you select
 - When testing AEC what parameters do you test.
 - Which standard reference do you compare results against
 - Multiple choice – and free text comments
 - **Sent to Medical Physics Mailbase and CTUG 23rd April 18**
 - **Received 50 responses with 6 week deadline**
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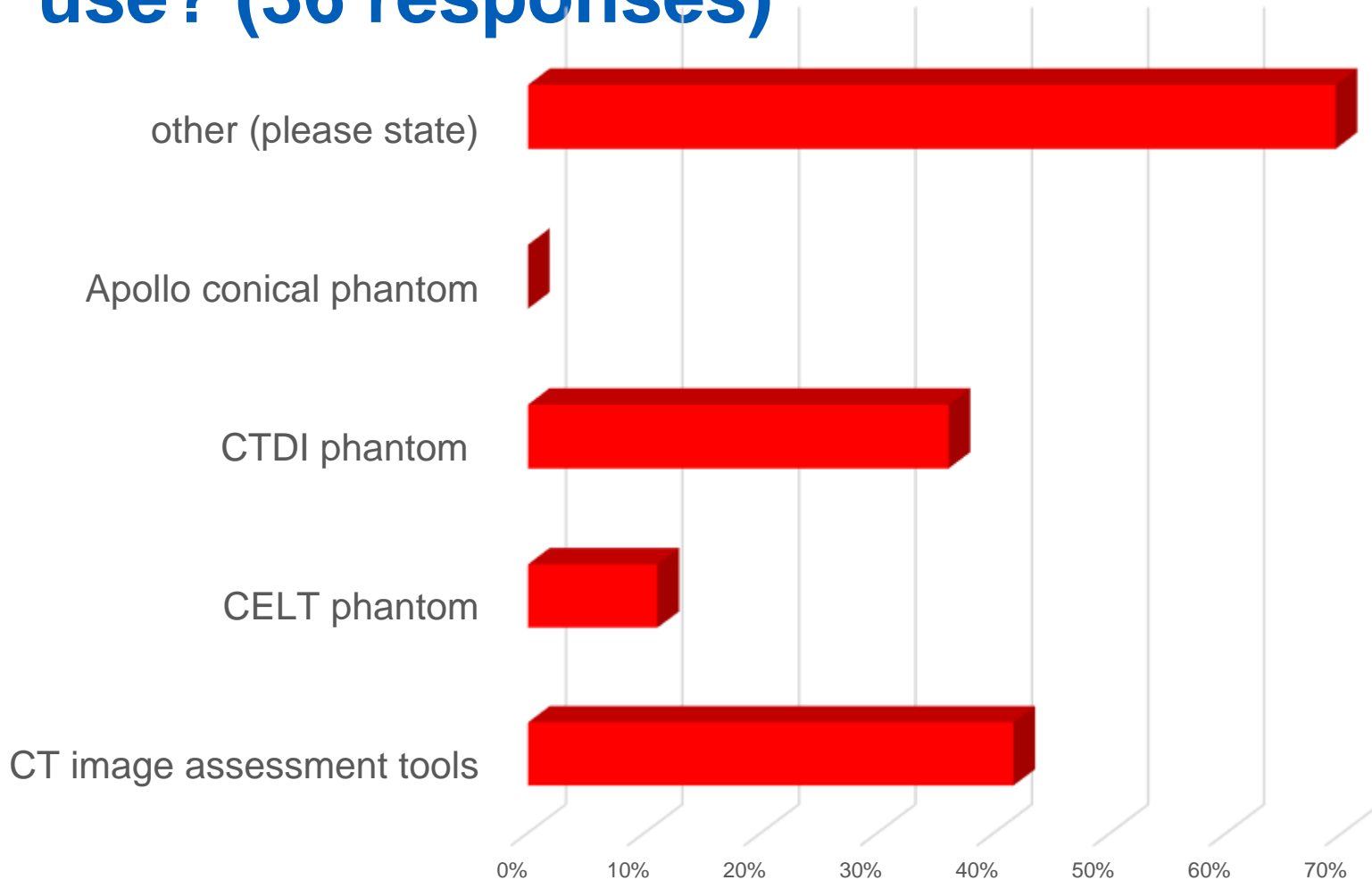
Do you test CT AEC on your scanner (50 responses)



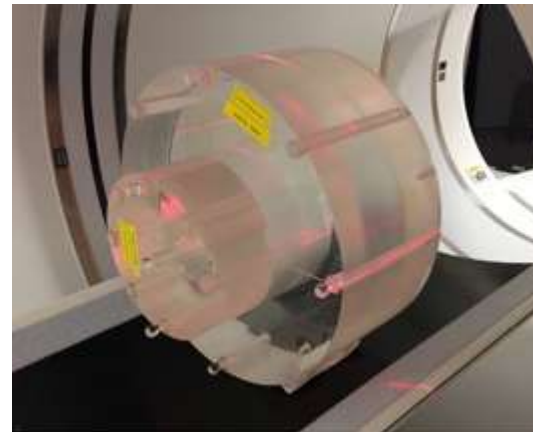
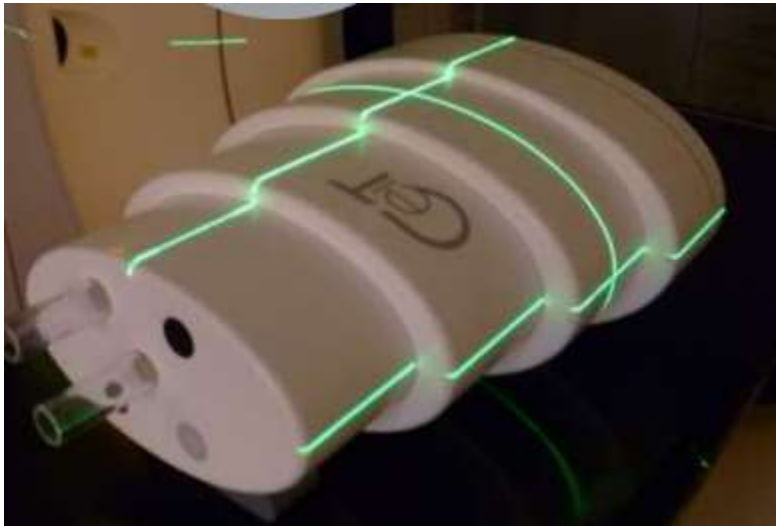
If 'don't test' – please share your reasons (25 responses)



When testing AEC what tools do you use? (36 responses)

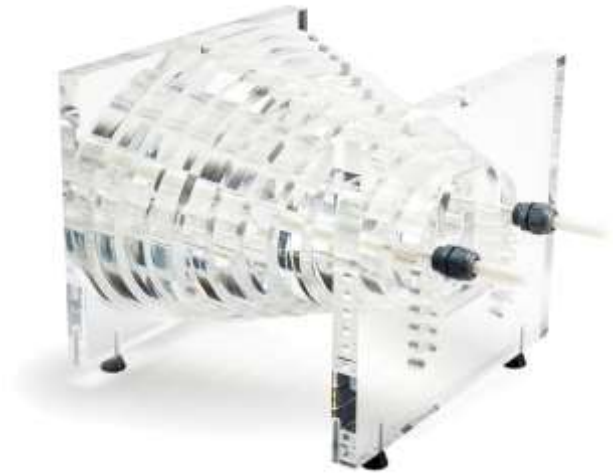


Phantoms

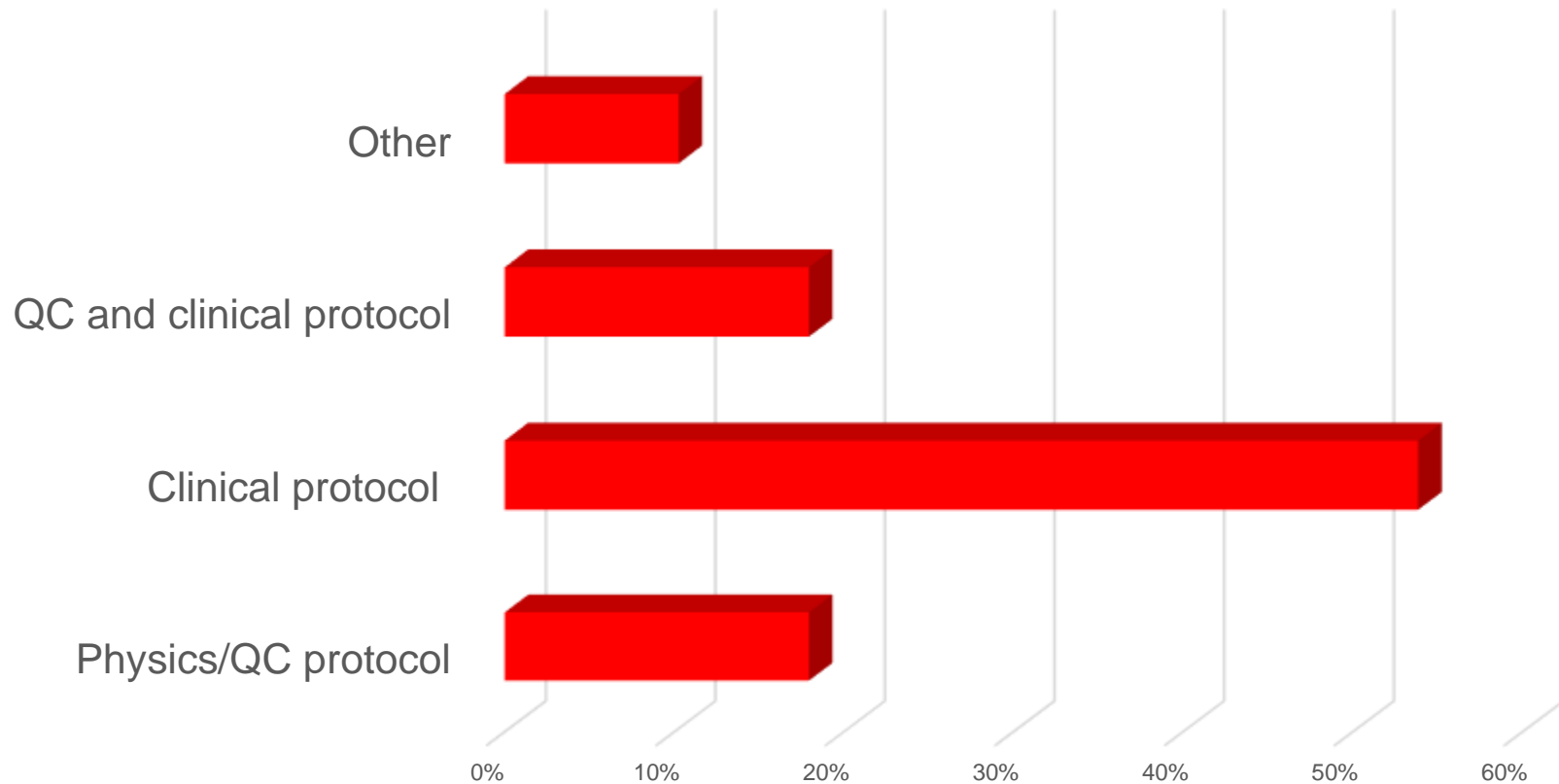


What did people mean by 'other tools'

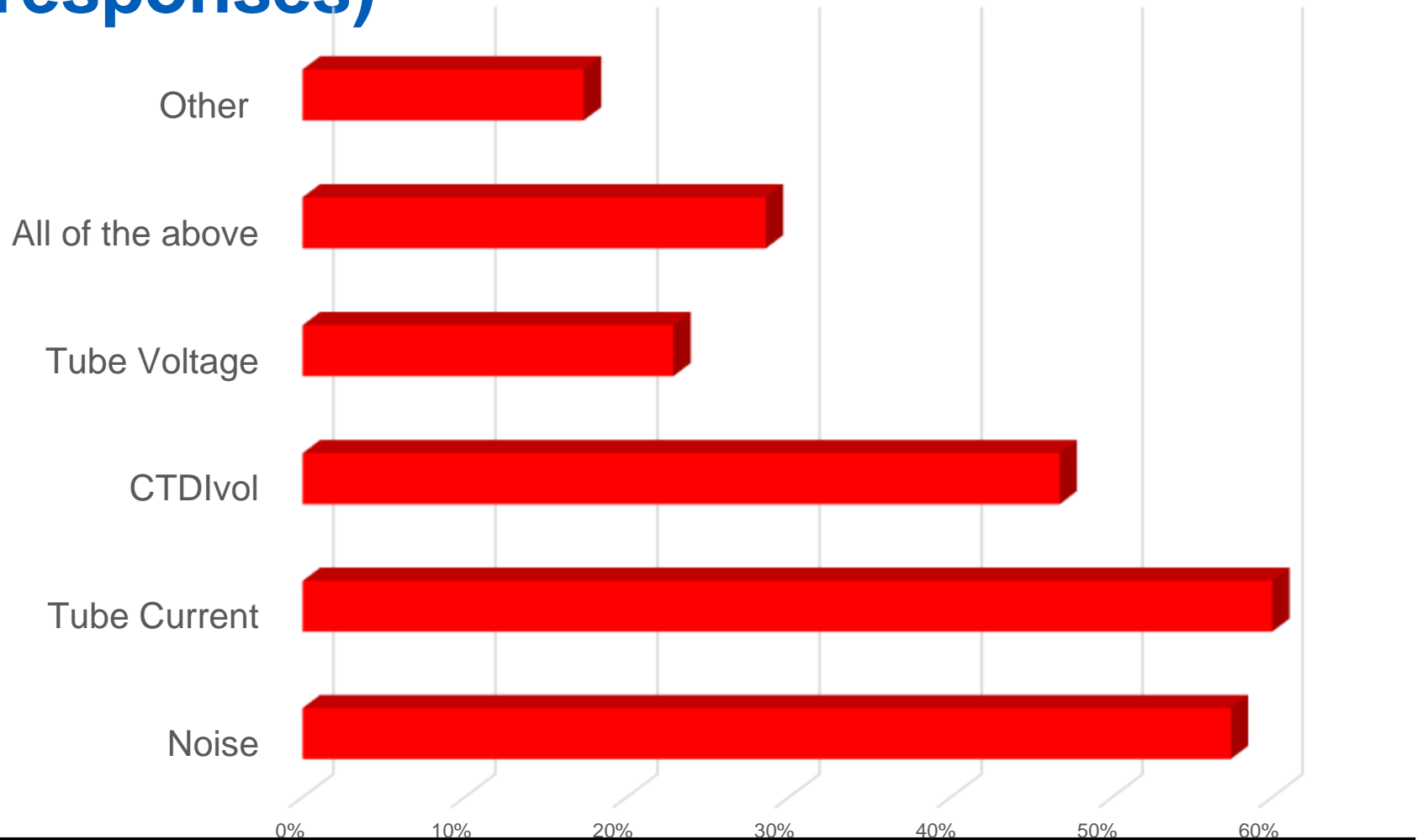
- Leeds CT AEC test object (x2)
- Rando (x2)
- Anthropomorphic (x4)
- In house elliptical (x5)
- Catphan with body annulus half out
- Range of available phantoms positioned together (x3)



When testing AEC what scan settings do you select (39 responses)



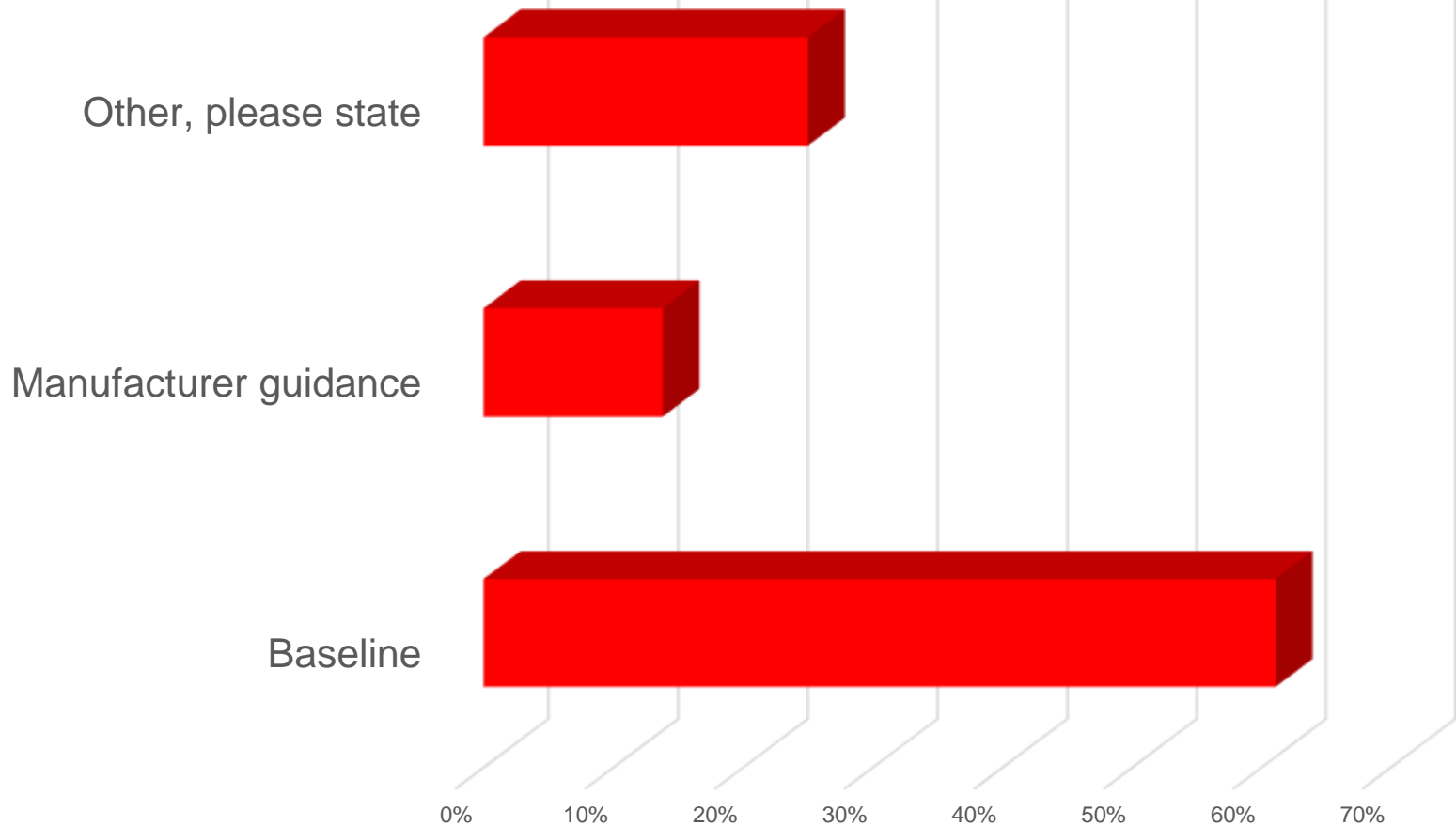
Which parameters do you test? (35 responses)



Comments on parameters tested

- ‘We also look at things like focal spot size that might have an mA dependence and if we can achieve a desired dose/scan time when using different combinations of pitch/tube rotation time and collimation.’
- ‘Calculate noise x root (mAs) if it is constant we know the detector sensitivity has not changed even if the AEC has.’
- CNR – iodine measurements

Which standard/reference do you compare your measurements against? (36 responses)



Comments on what to measurements results to

- Literature
- White papers
- Comparison to similar scanners
- Self consistency as parameters vary

General Comments

- It's not clear what action could be taken to change AEC response and when action would be required.
- Was really interested in the Celt phantom until I found out it was stepped. I have seen published work that shows most AECs do not work well with steps.
- Manual handling concerns
- With dose management systems, dose audit can confirm consistent AEC performance

Conclusions

- **Wide variations in practice**
- **Consensus that we should be doing some testing of CT AEC**
- **Guidance clearly needed**
- **At GSTT we will be pursuing use of CELT phantom**