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# High resolution SFOV gamma camera systems

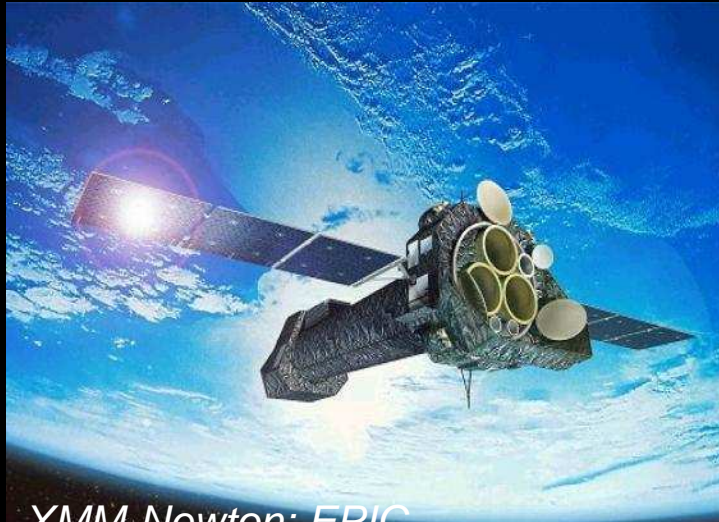
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John Lees

University of Leicester

# UoL Space Research Centre

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XMM-Newton: EPIC

Technologies and Expertise  
Optical, UV, X-rays, gamma rays  
Charge Coupled Devices: CCD



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# Gamma Cameras and Probes



A dual head gamma camera

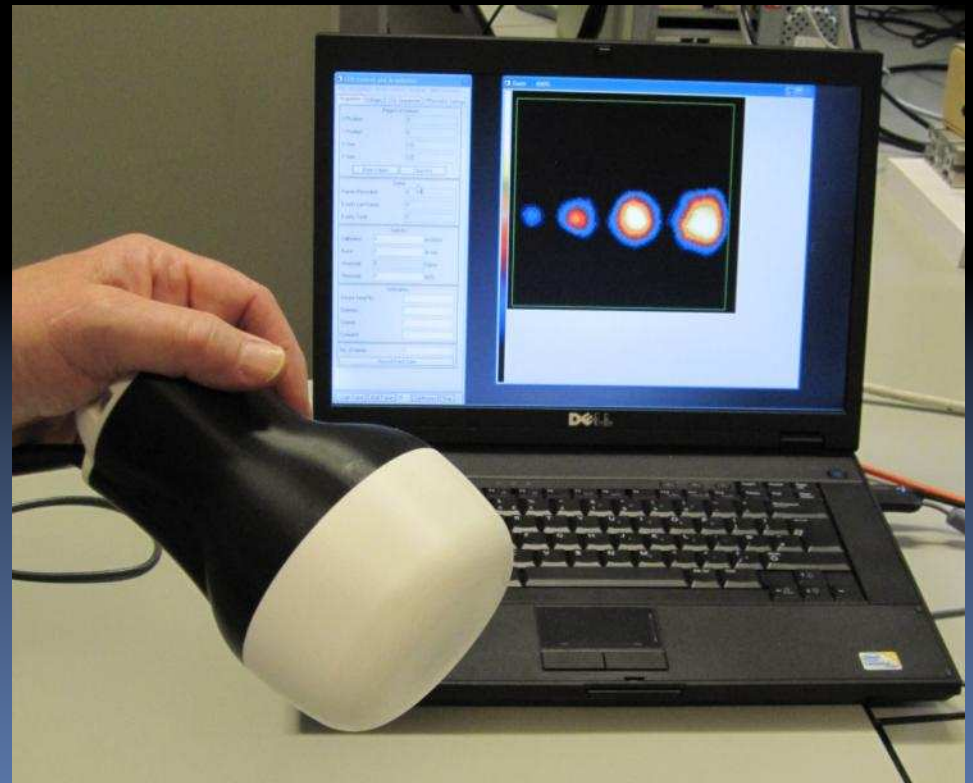


A nuclear probe detector

# Mini Gamma Ray Camera

(MGRC)

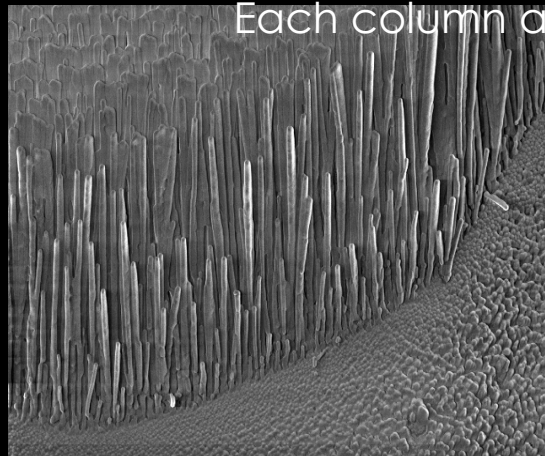
- Scintillator coated CCD
- Complementary to “standard” Gamma Camera
- High spatial resolution (<1mm)
- Energy range 30-160 keV.
- International Patents
- Hand held potential
- Point of care testing



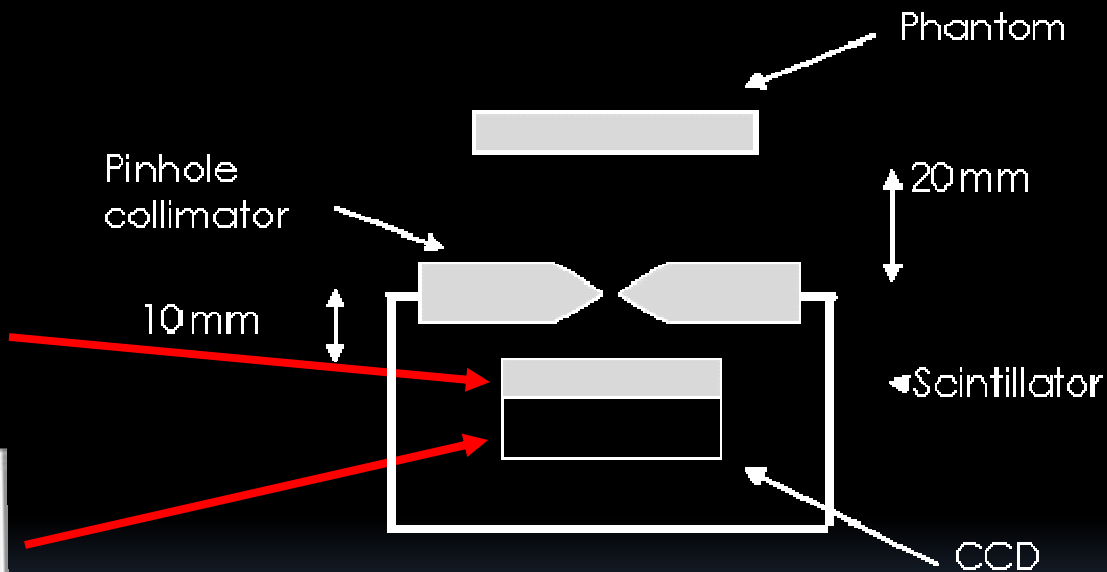
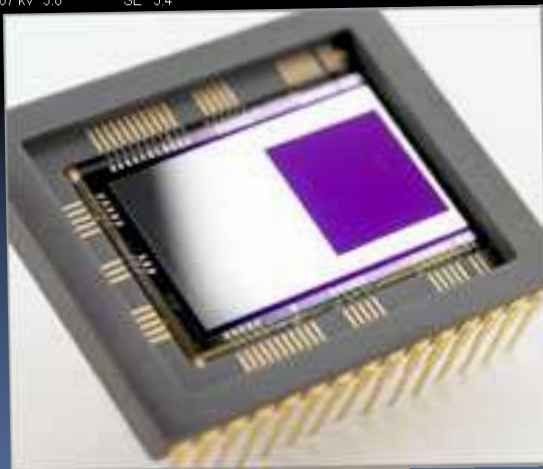
# Camera Schematic

## Columnar CsI

Each column acts as a "light pipe"



Acc.V Spot Det WD  
5.07 kV 5.0 SE 5.4



The mini gamma camera

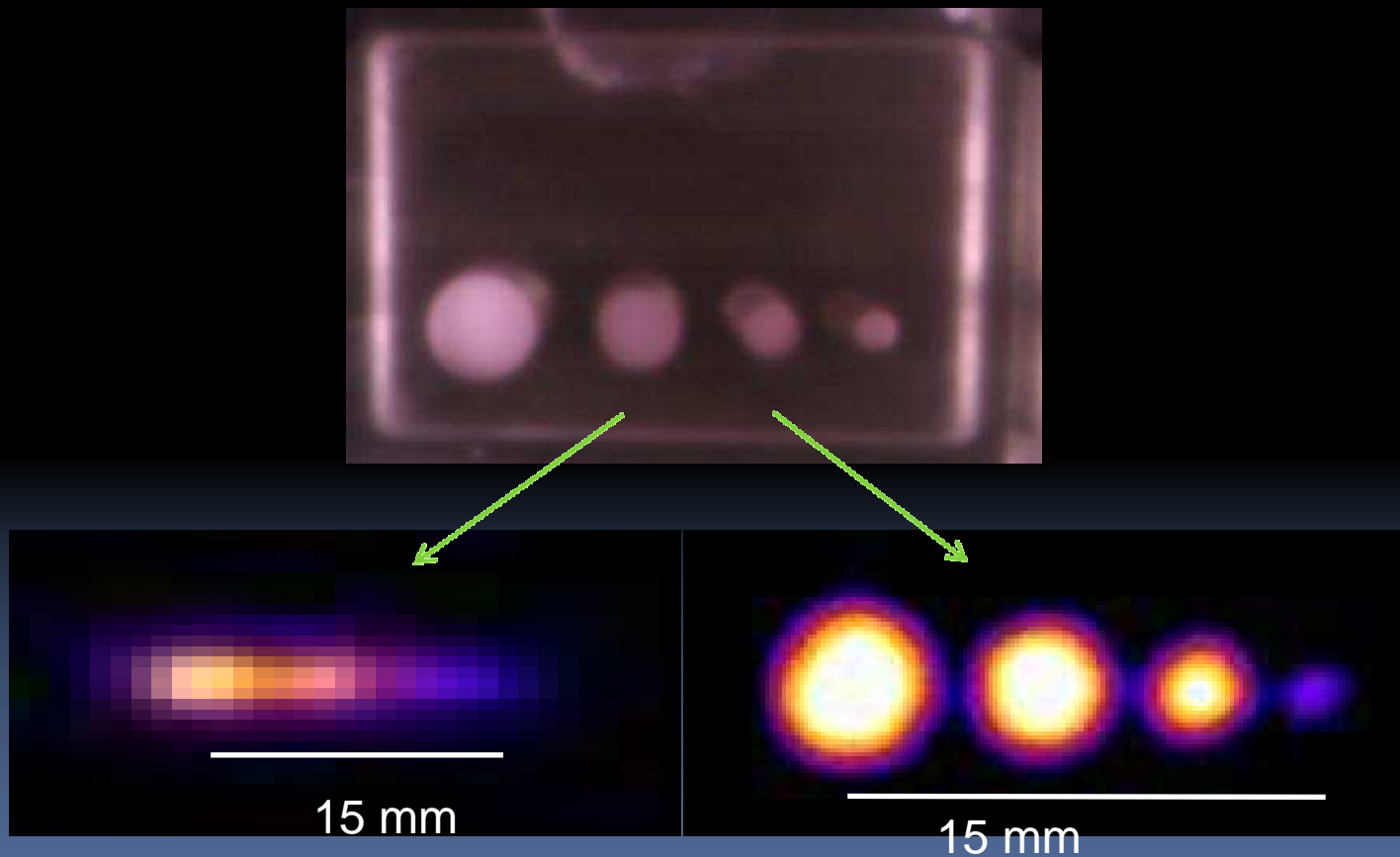


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# Comparison with WBGC

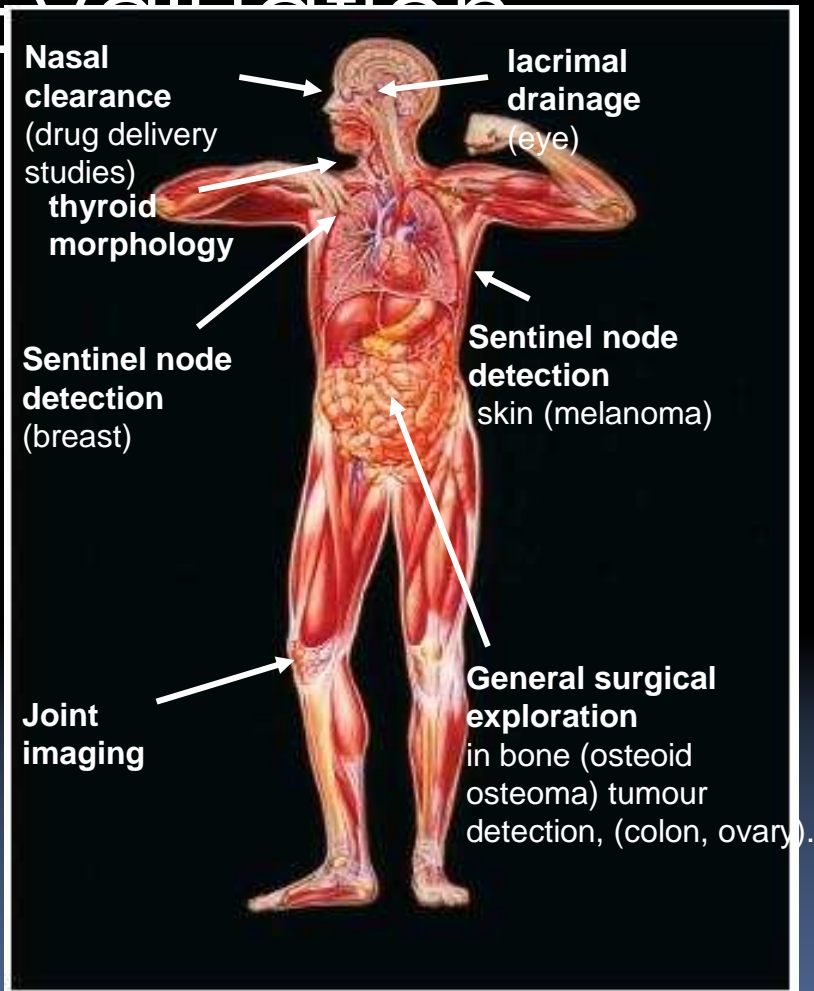
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- Hot spot Phantom  $^{99m}\text{Tc}$

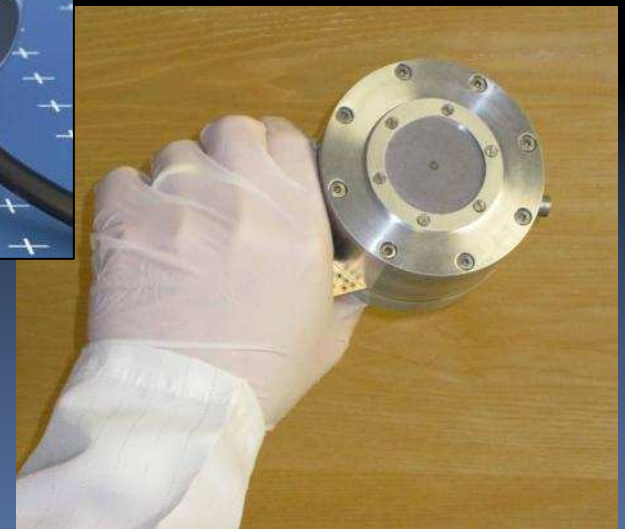
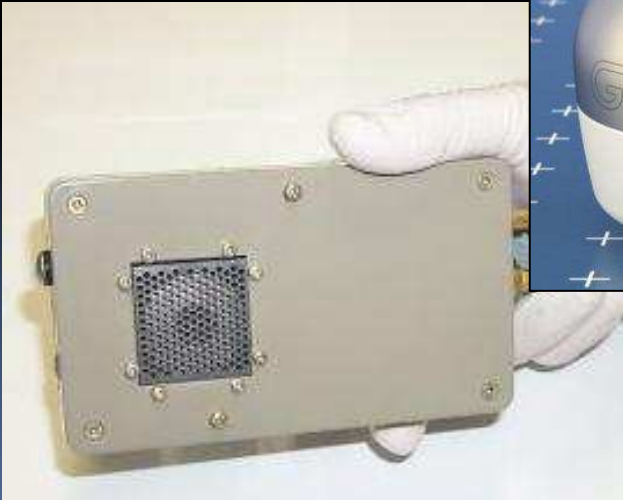
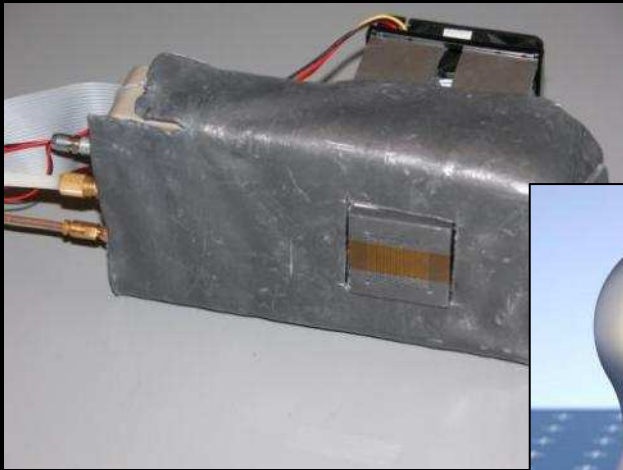


# Clinical Applications &

## Evaluation



# Design evolution - MGRC





# Clinical prototype design

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MGRC in clinical setting



MGRC prototype



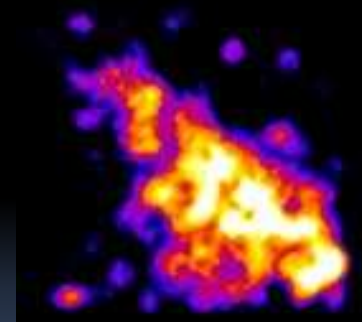
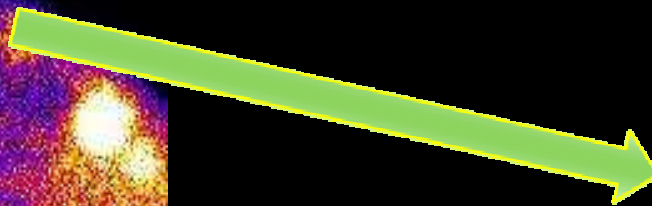
# Clinical trial, QMC Nottingham

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Tc-99m-HDP bone imaging in patient



Conventional gamma camera



HR Mini gamma camera

# Multi-wavelength approach

The Milky Way



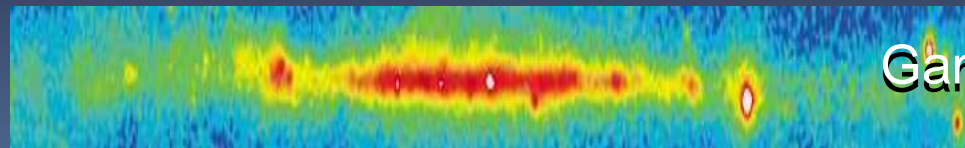
Near-Infrared



Optical

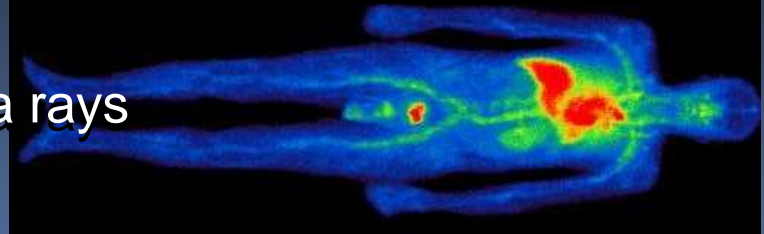
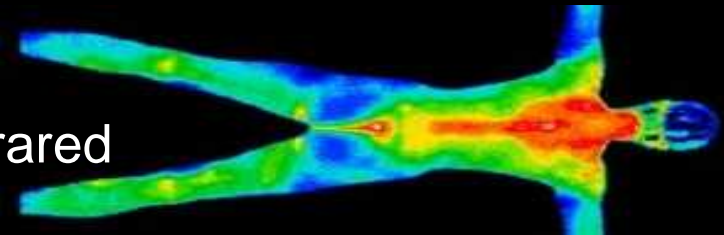


X - rays



Gamma rays

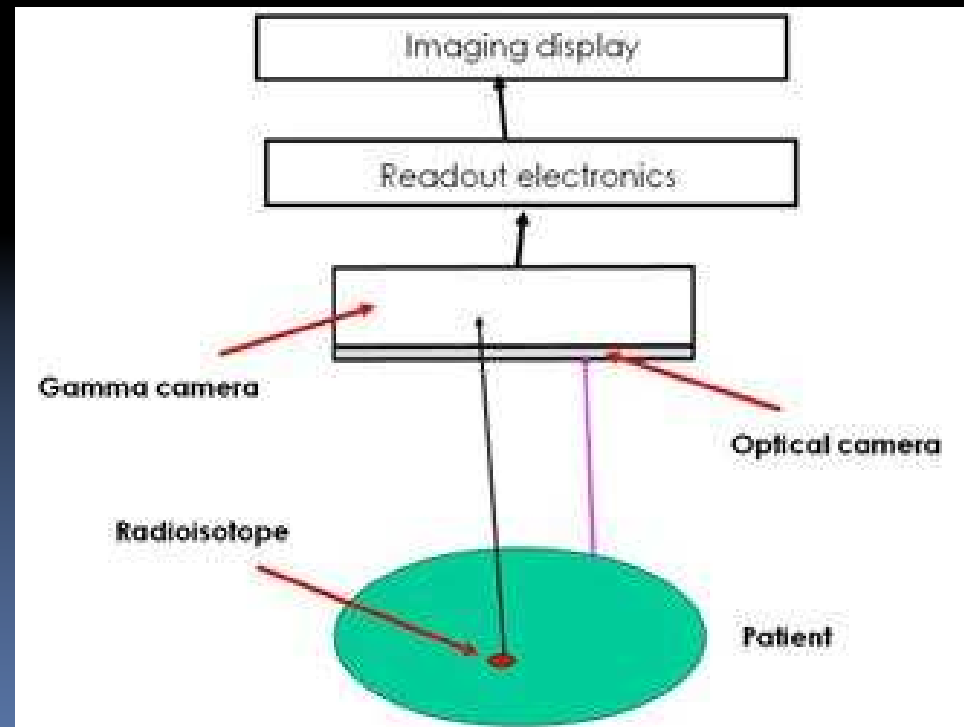
Man



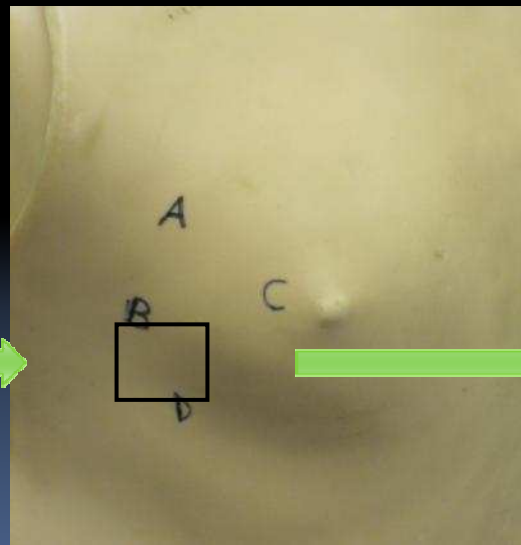
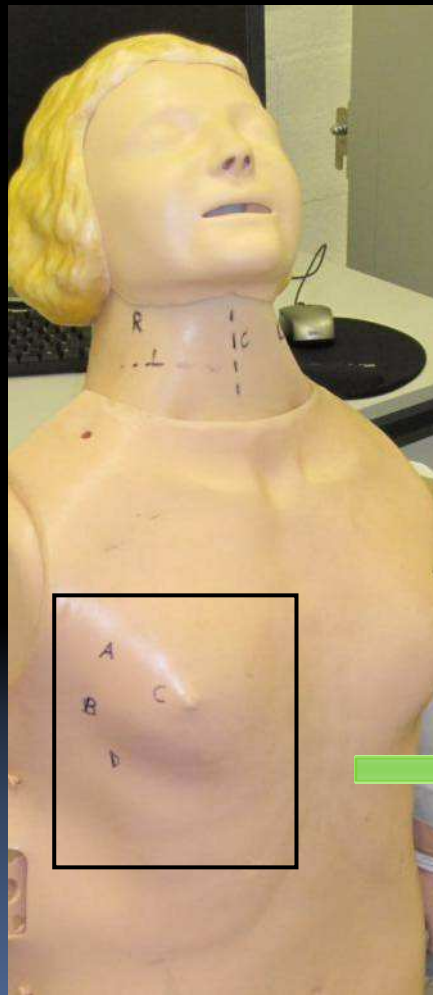
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# Hybrid camera

- A combined optical and gamma camera system
- Co-aligned optical and gamma camera
- Minimises parallax
- Minimises image registration problems



# Lymph node phantom



# Hybrid Imaging



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# Benefits of SFOV Cameras

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- High spatial resolution (<1mm)
- Energy range 30-160 keV.
- Hand held potential
- Point of care imaging

Intra-operative imaging will

- Improve patient management
- Increase surgical confidence
- Reduce surgery time
- Reduce cost of treatment



# Acknowledgements

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