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Potential change to Nuclear Medicine Service at PRH.

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Background

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- Nuclear Medicine is a very heavily legislated service and each site (PRH and RSH) require a licence to operate.
- In November 2025 IR(ME)R (the governing body) limited the PRH licence due to the age of the camera. Therefore limiting the type of scans and tests that we are allowed to perform at this site.
- Prior to this an average of 4 patients were scanned on the camera once a week..
- Patients will need to travel to RSH to have tests due to the licencing constraints.
- The service was impacted by the COVID pandemic, and the service was shut from March 2020 until August 2022 when partial service was resumed. This contributed to the significant waiting list and backlog of patients.
- Post pandemic there was a significant patient waiting list backlog with and average waiting time of 258 days. The longest waiting time for one of these patients was 652 days.
- CAMERA AGE - The camera at PRH is 22 years old and the imaging quality is inferior to modern gamma cameras. Patient who do have a scan on this camera have poorer quality images then those on a new camera. The camera received its end of life notice on the 31/3/2025 and replacement parts for this camera can no longer be guaranteed.
- COST- The cost to the trust for two ARSAC site licences is significant.
- WORKFORCE – The site requires at least 3 staff members to run safely. Currently workforce is with RSH. This reduces the workload that RSH can safely do when PRH is also running.
- Radiopharmacy generate the injections (isotope) required for each test, this is based at RSH and therefore cannot get these to PRH before 10 am and must be made prior to RSH's order, impacting the number of patients who can be scanned.

Proposal

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Looking at the proposed service change.

- For multiple reasons, the preferred option is to shut the PRH site. The room the gamma camera is in at PRH is not big enough to fit a new replacement modern gamma camera. Keeping the service at PRH would come with significant costs and would mean a completely new build for a nuclear medicine service at PRH and additional staffing costs. The demand for this service is reducing with the development of technology.
- **How will it improve patient care?** Images generated using the RSH camera are of a superior quality increasing the likelihood of early detection of smaller lesions on bone scans and smaller scarring on kidney scans. This can therefore detect cancer spread earlier and improve treatment options. Due to the reduced transportation requirements, capacity can be increased reducing waiting times for scans for patients on cancer pathways.
- **How many patients will be impacted by this proposed service change? Are they specific groups of patients impacted (both positively and negatively)?** The PRH site has not been able to scan oncology patients since November 2025 and the type of scan that can be imaged at PRH has been limited to only two types kidney scans. An average of 4 patients a week and from 4 to 16 patients a month will be impacted by the closure of this site. However by moving their care to the RSH site they will receive a higher quality standard of imaging at RSH compared to the dated camera at PRH.
- **Will it support any workforce issues?** Due to the specialist nature of Nuclear Medicine, recruitment to the specialist roles has always been difficult, consolidation the workforce on the RSH site it will allow for a high quality, consistent service with a reduction in waiting times.
- **Will it future proof the service?** With the paediatric service due to transfer to RSH by 2028 and with oncology already located at RSH it is preferable to have the nuclear medicine service, which is dependant on these modalities, to gather in one place for ease of patient flow and experience.
- **Will this service change impact on any other services being provided?** This service change will also have a positive impact on the radiopharmacy department in addition to the nuclear medicine department. This will reduce their paperwork and workload allowing them to better organise their time and improve productivity.
- **Timescales:** It is planned to decommission the scanner at PRH in the autumn of 2026 allowing for redevelopment od other modalities into the space which have a significantly greater demand and longer witing times.

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A RSH only service would mean

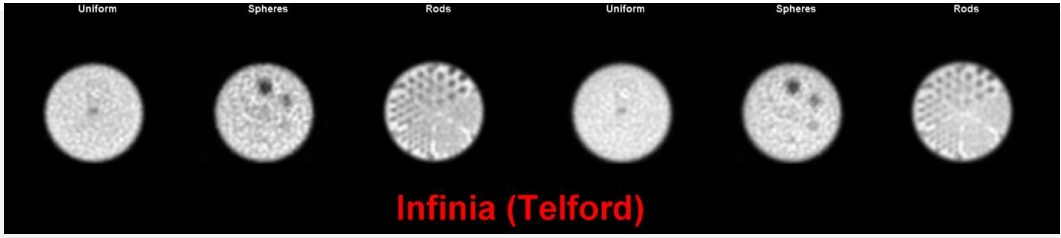
- Higher quality service offered to all patients rather than an inequality based on the site the examination takes place.
- Improved diagnostic image quality, allowing for earlier detection of cancer and increase treatment options.
- Reduce waiting times for patients on cancer pathwys.
- Improved productivity at the RSH, reducing waiting times.
- Improves regulatory compliance, reduces non-patient facing workload releasing capacity for scanning.

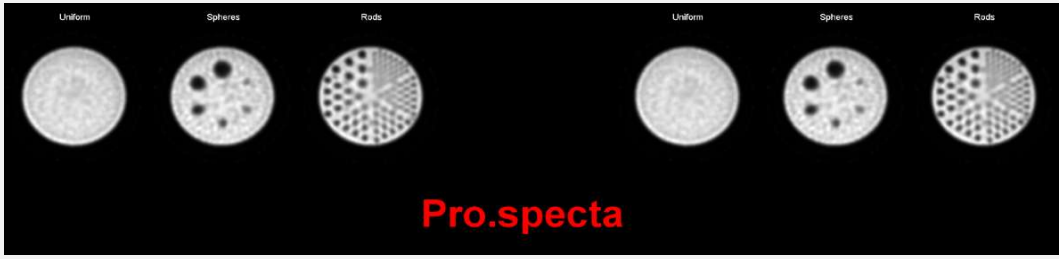
Image quality

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Image quality comparison between PRH and RSH gamma cameras.

The image quality for a gamma camera spatial resolution (how well the camera can detect ever smaller distinctive artefacts) is measured using a phantom composed of ‘rods’ and ‘spheres’.
Comparing the PRH (Infinia) camera and the RSH (Pro.SPECTa) cameras the Uniform images show an imaging artefact in the centre of the PRH image. The Spheres images show only two spheres clearly for PRH while the RSH camera image shows six definitive spheres. The rod images show 3 segments clearly for the PRH camera compared to the five clear segments for the RSH camera.





Images of the Rod and Sphere Jaszczak phantom used to create the above comparison.



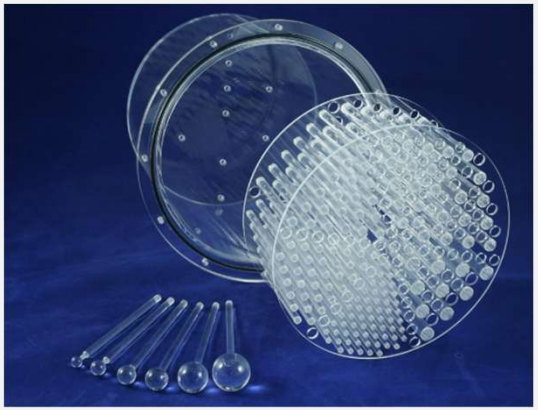


Image quality impact on patients

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Image quality comparison between PRH and RSH gamma cameras.

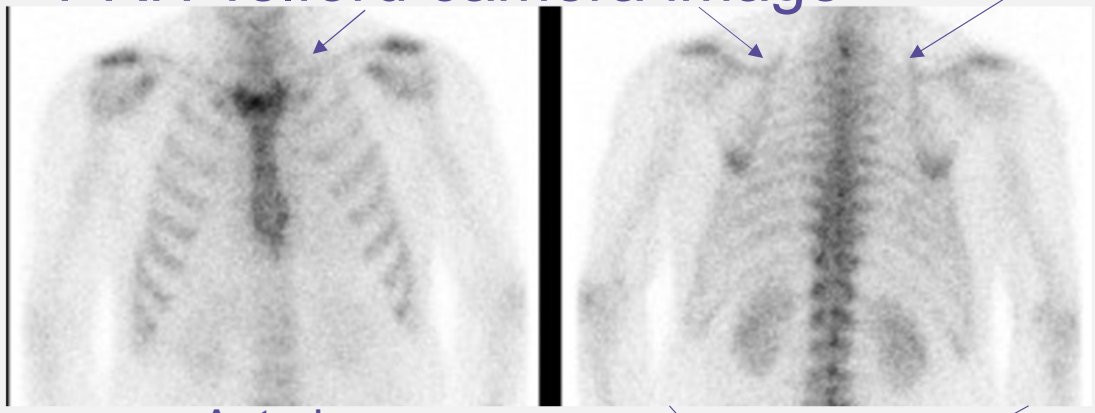
Spatial resolution is important in detecting cancer spread to the bones.

The bone images on the right depict two similar patients who were investigated for cancer spread to the bones. The top images were taken using the gamma camera at Telford the bottom images were taken using the gamma camera at Shrewsbury.

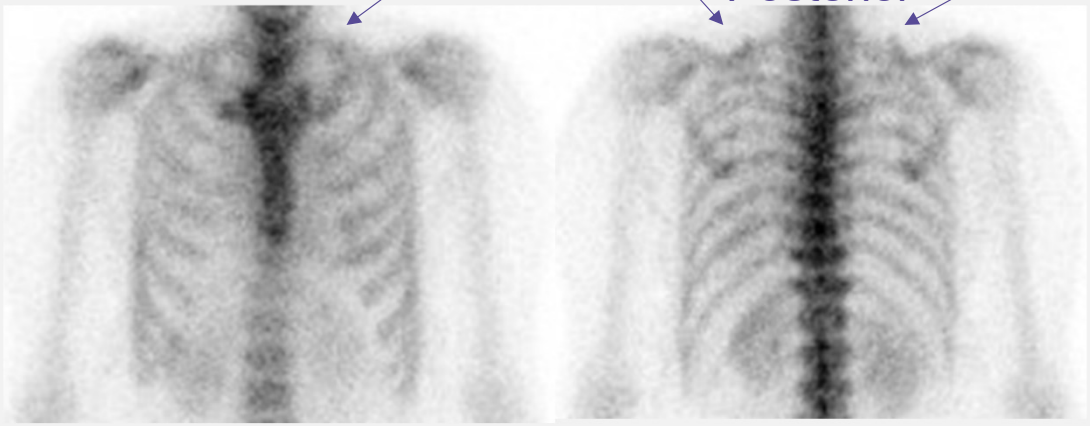
There is less definition in the ribs on the image taken on the PRH camera compared to the image taken on the RSH camera. It is almost impossible to see ribs 1- 5 on the posterior image from the PRH camera which means any lesion on these ribs would go undetected. Whereas the RSH shows clearer images of the ribs and gives more detail.

The better the spatial resolution the smaller the lesion that the camera can identify the more accurately the camera can detect distant cancer spread, scarring on kidneys and small anomalies on all types of scans.

PRH Telford camera image



Anterior Posterior



RSH Shrewsbury camera image

Image quality impact on patients

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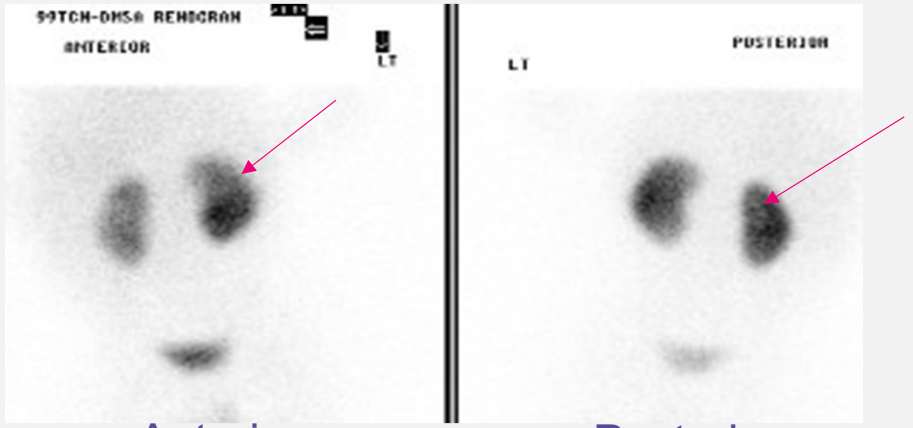
Image quality comparison between PRH and RSH gamma cameras.

Spatial resolution is important in detecting renal scarring in children. The images to the right show two different paediatric patients The lighter area on the kidneys shows a scarring lesion from UTI's (urinary tract infections).

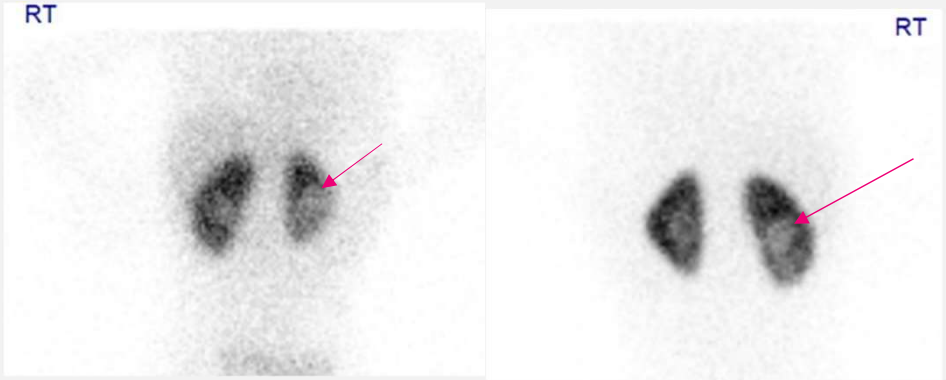
The lighter scarring lesion shown on the Telford camera is not as well defined as the lighter scarring lesion shown on the Shrewsbury camera. (pink arrows) There is a clear edge shown on the RSH images in comparison to the PRH images.

The better the spatial resolution the smaller the lesion that the camera can identify the more accurately the camera can detect distant cancer spread, scarring on kidneys and small anomalies on all types of scans.

PRH Telford camera image



Anterior Posterior



RSH Shrewsbury camera image

Reasons for change

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The governing body for nuclear medicine work has granted only a limited licence for the PRH site. This has reduced the number of different types of scans that can occur at PRH from 46 types of test to 3 types of test.

This greatly reduced the practicality of continuing to use and staff this service when we are unable to provide a full service.

How does the proposed service change align with the Hospital Transformation Programme?

Scans performed at PRH have historically been mostly for sedated paediatric patients. It is the current guidance from the British Nuclear Medicine Society that sedation for children should only be in exceptional circumstances. Therefore it is not necessary to continue the service at PRH on the sole basis that the paediatric team are available to sedated these patients. These paediatric patients have been successfully scanned on the RSH camera since January, and the backlog of patients has been cleared.

Key benefits and issues

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Key Benefits to patients

- Patients seen quicker as there was only one day of service a week.
- Paediatric patients seen quicker as there is no need for sedation and the collaboration with the paediatric team.
- Patients receive better quality images with the capability to detect smaller lesions on the newer camera.

Key Benefits to service

- Reduced waiting list by not spreading staff across two sites.
- Reduced costs to the hospital – only one site license, no transport cost, no cost for new lead lined cases to transfer radiopharmaceuticals in, no medical physics support for PRH, no service contract for gamma camera maintenance for PRH and reduced cost for site radioactive sources (keeping PRH would require buying a new sealed flood source for quality control)

Patients Impacted

- The closing of the Telford PRH site impacts Paediatric patients the most as these were the primary patient demographics scanned. The patients could wait upto 658 days for a scan at PRH. By redirecting this service to RSH they can be booked within a couple of weeks. The number of paediatric patients impacted, without the waiting list backlog, is around 2-3 a month.