NHS Tayside has now considered your request dated 14 February 2019.

**Extract from Request**

“1. What imaging/scans does NHS Tayside offer for imaging parathyroid glands?

2. Why does a patient with a full thyroidectomy have to stop taking levothyroxine for a sestamibi or MIBI nuclear medicine scan if the scan is solely to locate the parathyroids? This information is stated on the yellow leaflet that nhs tayside sends out for the sestamibi scan, however it gives instruction but no reason why.”

**Response**

1. For patients diagnosed with Primary Hyperparathyroidism they are offered (dual isotope) Sestamibi scan plus parathyroid ultrasound, to assess for concordance of imaging and possible targeted parathyroidectomy

   For persistent hypercalcaemia post parathyroid surgery in addition we can offer 4D CT scan.

2. Parathyroid imaging using I-123 and Tc-99 Sestamibi has been widely used across the world since the mid-1980s.

   The methodology involves so-called dual isotope imaging. The purpose of the scan is to identify overactive parathyroid glands, which as the name suggests, lie close to the thyroid gland. Most people have four parathyroid glands, usually named by their location (right lower, left lower, right upper, left upper).

   Around 90% of solitary parathyroid glands are right inferior for embryological reasons. Parathyroid glands are usually very small and are difficult to locate due to their close proximity to the normal thyroid.

   The theory behind this dual isotope imaging is that I-123 will only be taken up by thyroid tissue, not by parathyroid glands.

   Tc-99 Sestamibi is from a family of radiopharmaceuticals called the Isonitriles. These compounds are taken up by tissues which are rich in mitochondria. High levels of mitochondria are found in metabolically active tissues. This means that Tc-99 Sestamibi will be taken up by both overactive parathyroid glands and also thyroid tissue.

   The biggest challenge in reporting these scans is separating tracer uptake in the thyroid gland from that in the parathyroid glands.

   For patients on Thyroxine, we routinely ask them to discontinue their Thyroxine supplements for at least two weeks prior to the date of the scan. This request is included in the Patient Information Leaflet. By doing so, this reduces the uptake of I-
123 into the thyroid gland and makes it easier to see the abnormal Sestamibi uptake as this is not affected by the cessation of the Thyroxine.

In statistical terms, the cessation of Thyroxine increases both the sensitivity and the specificity of the scan. It is possible to perform the scan using Tc99-Sestamibi alone but this has lower sensitivity and specificity than the dual isotope technique and is less likely to provide a definitive diagnosis.


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<tr>
<th>Document Ref.</th>
<th>FOISA Exemption Applied</th>
<th>Justification</th>
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<tbody>
<tr>
<td>IGTFOISA5972</td>
<td>None</td>
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Under section 20 (1) of the Act, if you are dissatisfied with the way NHS Tayside has dealt with your request, you have a right to request a review of our actions and decisions in relation to your request, and you have a right to appeal to the Scottish Information Commission.

A request for an internal review must be made in writing no later than forty working days from receipt of this response and addressed to:

Tayside NHS Board Secretary
Tayside NHS Board Headquarters
Ninewells Hospital & Medical School
Dundee
DD1 9SY

If you are not content with the outcome of the internal review, you have the right to apply directly to the Scottish Information Commissioner for a decision. The Scottish Information Commissioner can be contacted at:

Scottish Information Commissioner
Kinburn Castle
Doubledykes Road
St Andrews
Fife
KY16 9DS

Or via the online appeal service: [www.itstpublicknowledge.info/Appeal](http://www.itstpublicknowledge.info/Appeal)
If you have any queries about this correspondence, please contact:

Information Governance Team
Maryfield House
30 Mains Loan
Dundee
DD4 7BT

Telephone - 01382 424413
E-mail: informationgovernance.tayside@nhs.net

Information Governance
NHS Tayside
13 March 2019