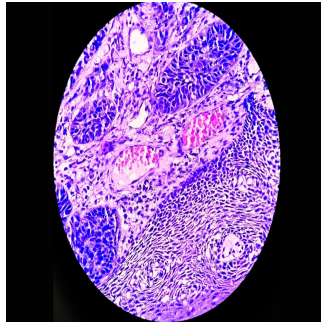


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## PET/CT in Neuroendocrine Tumour Management



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Neuroendocrine neoplasms (NEN) are a rare and heterogeneous malignancy group that predominantly affects the gastrointestinal system and pancreas. The management of these tumours is complex due to their variable biological behaviour and growth rates, necessitating a precise and tailored approach to diagnosis and treatment. Among diagnostic tools, PET/CT imaging has emerged as a critical component in the management of NEN. It allows for accurate staging, monitoring, and therapeutic planning. The European Society for Hybrid, Molecular, and Translational Imaging has issued practice recommendations highlighting the essential role of PET/CT in the diagnostic and therapeutic pathways for neuroendocrine tumours.

### PET/CT in Diagnosing Neuroendocrine Tumours

Positron emission tomography combined with computed tomography (PET/CT) has revolutionised the diagnostic landscape for neuroendocrine tumours. For well-differentiated tumours, particularly those that express somatostatin receptors (SSR), PET/CT using SSR-directed tracers is the gold standard. This imaging modality allows clinicians to assess the extent of SSR expression, which is vital for determining a patient's eligibility for specific therapies, such as peptide receptor radionuclide therapy (PRRT). Additionally, PET/CT is the preferred method for initial staging and restaging after both curative and non-curative surgeries. Its precision in detecting both primary tumours and metastases makes it indispensable in ensuring comprehensive treatment planning.

### PET/CT and Therapy Monitoring

One of the significant contributions of PET/CT is its ability to monitor therapy response, particularly in patients receiving PRRT. This therapy targets SSR-positive tumours using radiolabelled somatostatin analogues. By employing PET/CT, clinicians can evaluate the progression of the disease by observing changes in SSR expression and tumour size. Integrating PET/CT with other imaging techniques, such as MRI, enhances the accuracy of the assessment. For instance, liver metastases, common in neuroendocrine tumours, are often better evaluated with a combination of PET/CT and liver-specific MRI sequences. This multimodal approach ensures clinicians have a clear understanding of tumour behaviour, allowing for timely adjustments in treatment.

### Follow-up and Long-term Management

The follow-up of patients with neuroendocrine tumours is a nuanced process, requiring regular imaging to detect any recurrence or progression. The grade and stage of the tumour determine the frequency of PET/CT scans. For low-grade (G1) and intermediate-grade (G2) tumours, follow-up intervals of 6–12 months are typical, whereas high-grade (G3) tumours and those with rapid progression may necessitate imaging every 2–3 months. In cases where patients have undergone successful resection, long-term monitoring with PET/CT remains crucial, as some tumours may recur even after extended periods. The ability of PET/CT to detect even small changes in tumour biology ensures that clinicians can intervene promptly.

Integrating PET/CT into the diagnostic and therapeutic pathways for neuroendocrine tumours has significantly improved patient management. Its role in staging, therapy monitoring, and follow-up is invaluable, providing clinicians with the insights to tailor treatment strategies effectively. As the European Society for Hybrid, Molecular, and Translational Imaging's recommendations underscore, PET/CT should be a cornerstone of neuroendocrine tumour care, particularly for well-differentiated, SSR-positive tumours. With ongoing advancements in imaging technology and the development of new tracers, PET/CT's utility in managing these complex tumours will only continue to grow, offering hope for better patient outcomes.

Source: [European Radiology](#)

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