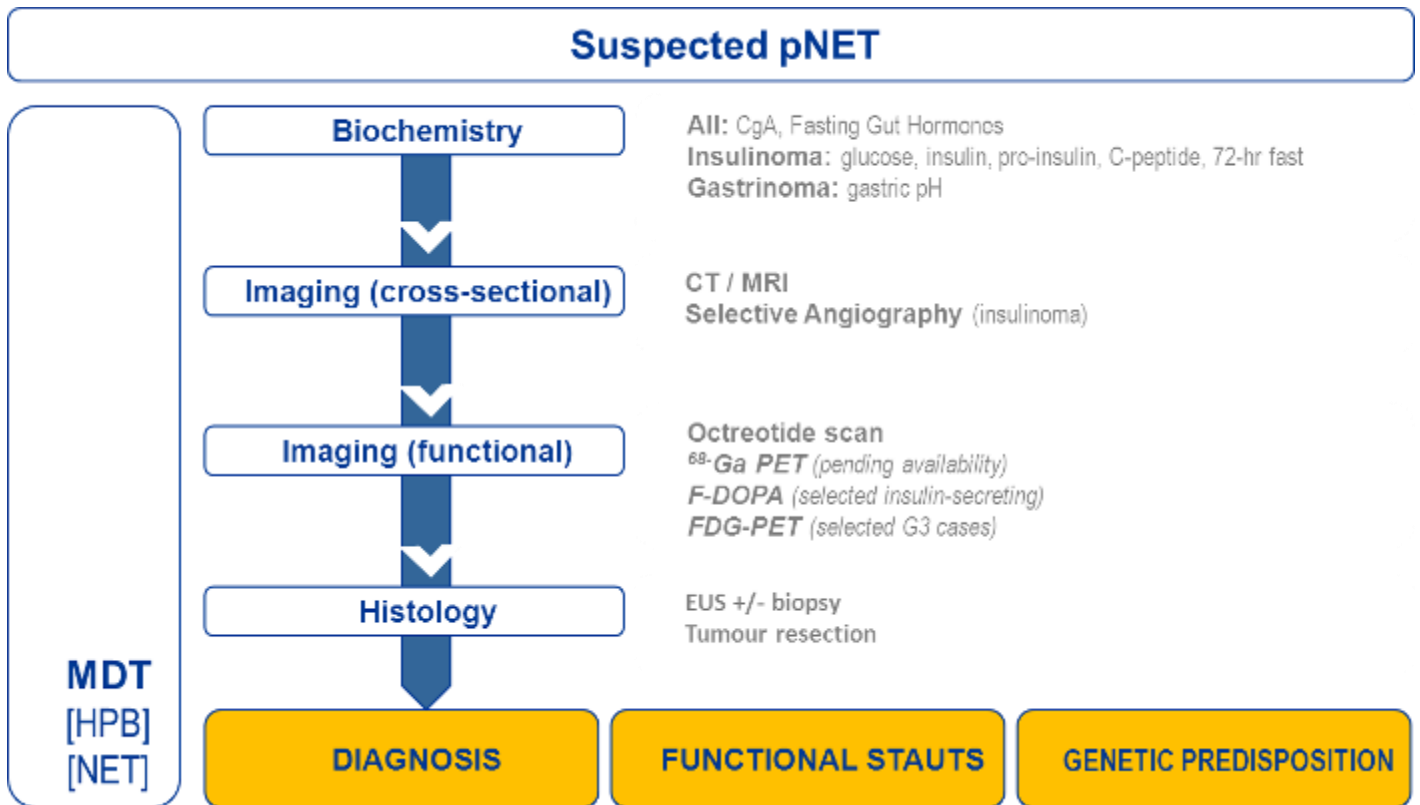

**Greater Manchester and Cheshire HPB Unit
Guidelines for the Assessment &
Management of Hepatobiliary and
Pancreatic Disease
Chapter 14**

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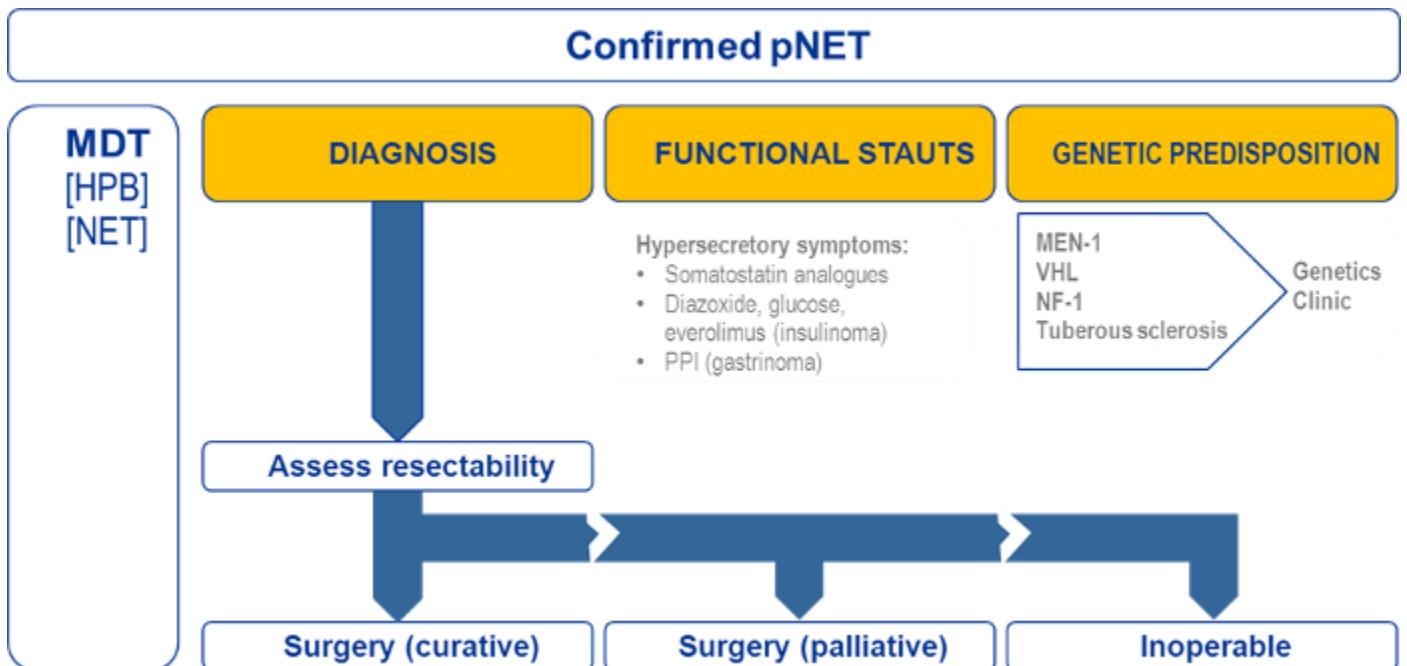
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14. Neuroendocrine Tumours

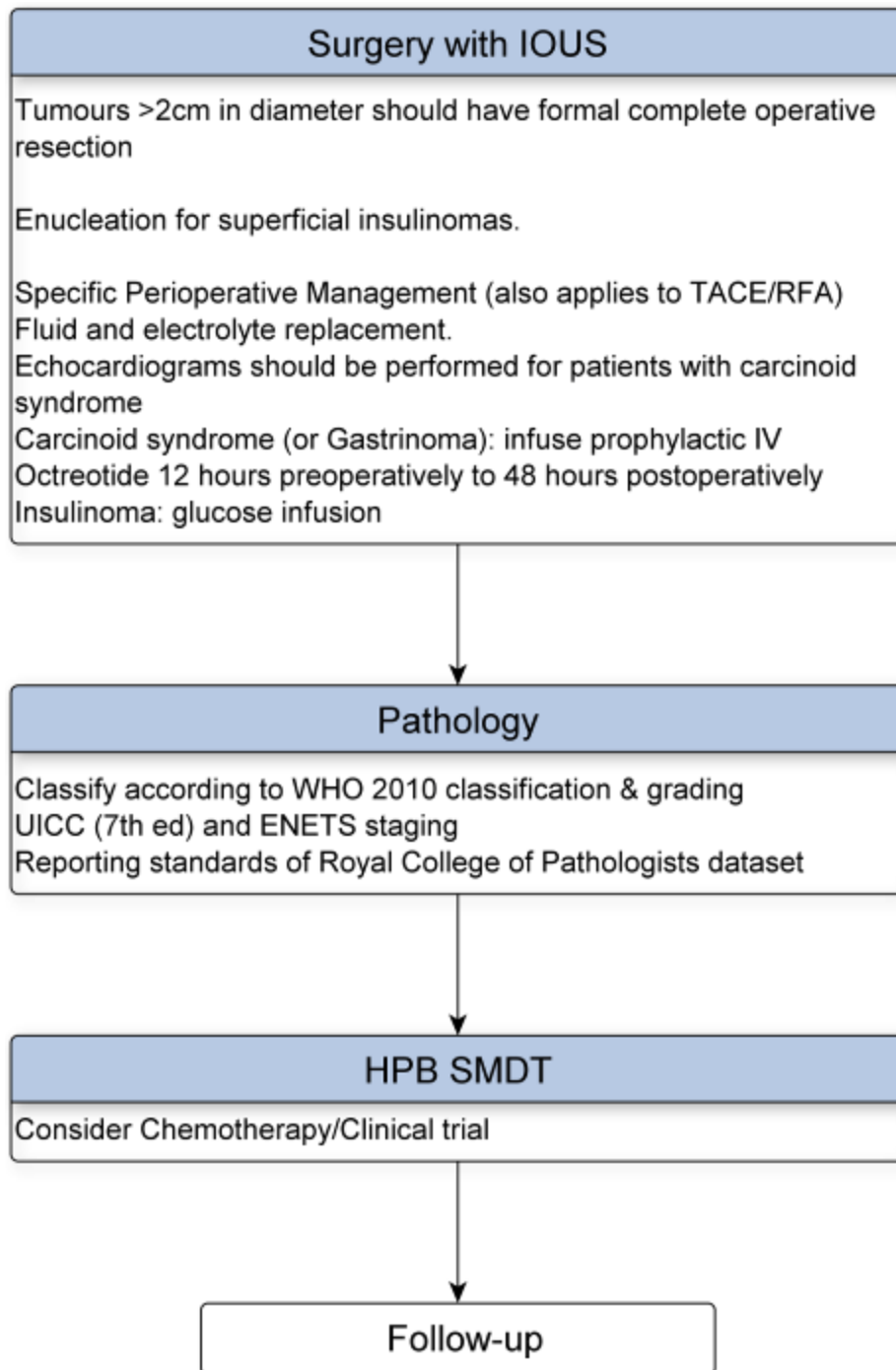
14.1. Diagnostic algorithm for pancreatic neuroendocrine tumours (PNETs)



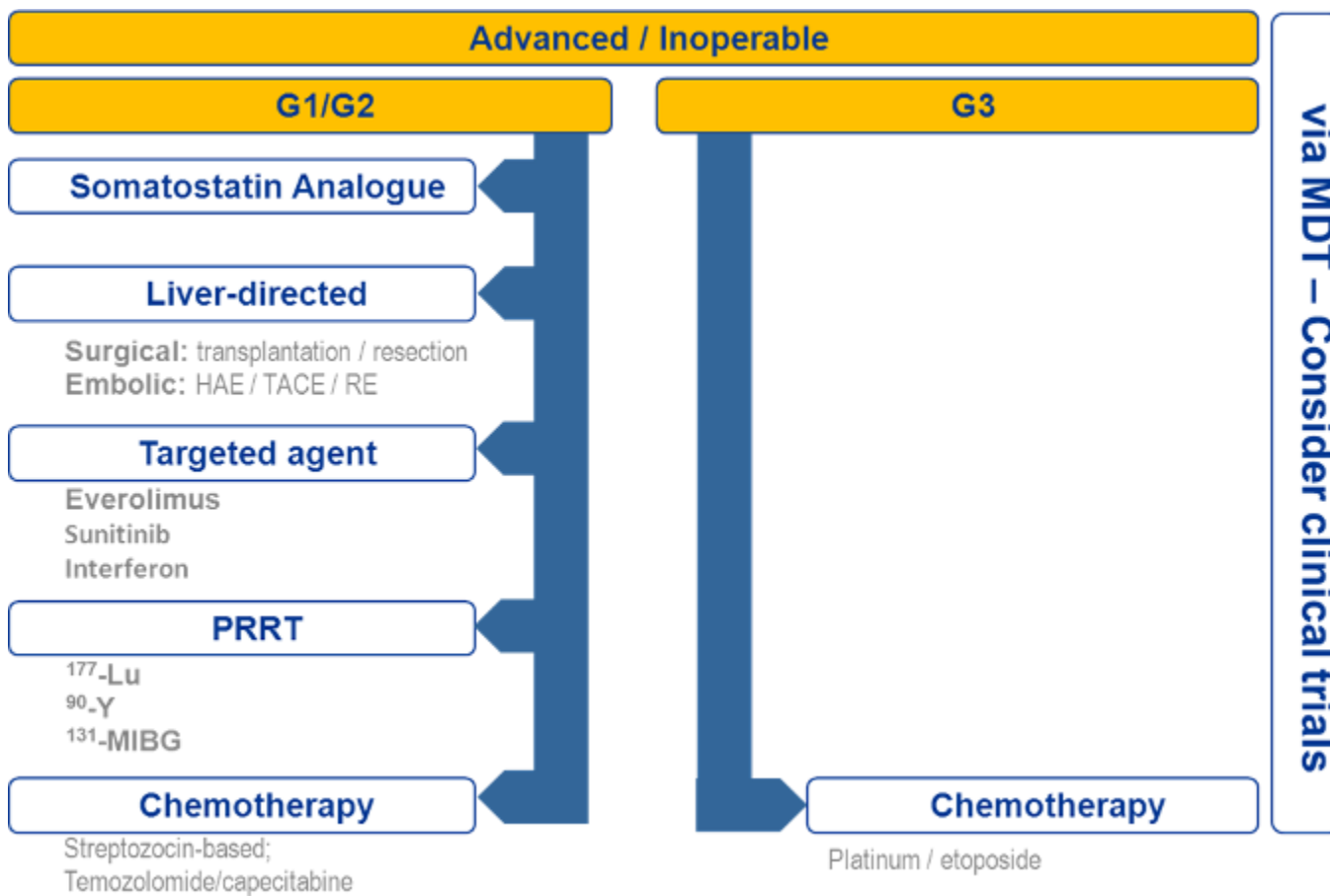
14.2. Management of PNET



14.3. *Surgical management of resectable PNET*



14.4. Management of Residual/Progressive/Metastatic/Inoperable PNET



14.5. *ENETS TNM and WHO classification of PNET*

Grading system for pancreatic neuroendocrine tumours

Grade	Mitotic count (10 HPF)*	Ki-67 index (%)**
G1	<2	≤5
G2	2–20	>5–20***
G3	>20	>20

* 10 HPF = 2 mm² based on each hpf being 0.2 mm² with at least 40 fields evaluated in areas at highest mitotic density.

** Ki-67 index: % of tumour cells in a 2000 cell sample from the areas of highest nuclear labelling.

*** Note that the exception to the 2% MIB1 threshold is the pancreas. A large study showed that when a 5% rather than 2% Ki-67 labelling index cut-off was applied, Ki-67 was an independent predictor of prognosis.

ENETS TNM classification of gastrointestinal neuroendocrine tumours

Neuroendocrine tumours of the pancreas

pTX Primary tumour cannot be assessed

pT0 No evidence of primary tumour

pT1 Limited to the pancreas and size <20mm

pT2 Limited to the pancreas and size 20–40mm

pT3 Limited to the pancreas and size >40mm

pT4 Invading the wall of adjacent large vessels (coeliac axis or superior mesenteric artery), stomach, spleen, colon or adrenal gland

For any pT, add (m) for multiple tumours.

N – lymph node status: definition is the same for all primary sites

pNX Regional lymph node status cannot be assessed

pN0 No regional lymph node metastasis

pN1 Regional lymph node metastasis

M – Distant metastasis: definition is the same for all primary sites

pMX Distant metastasis cannot be assessed

pM0 No distant metastasis

pM1 Histologically confirmed distant metastasis

pM1a Metastasis to specific sites

WHO 2000/2004 classification of pancreatic neuroendocrine tumours

Site	Well-differentiated neuroendocrine tumour (Benign behaviour)*	Well-differentiated neuroendocrine tumour (Uncertain behaviour)	Well-differentiated neuroendocrine carcinoma (Low-grade malignant)	Poorly differentiated neuroendocrine carcinoma (High-grade malignant)
Pancreas	Confined to pancreas Functioning insulinoma <20 mm Non-functioning tumours <20 mm No vascular invasion No perineural invasion <2 mitoses/10 HPF/Ki-67 index ≤2%	Confined to pancreas and one or more of the following: >20 mm Perineural invasion Vascular invasion 2–10 mitoses/10 HPF/Ki-67 index >2%	Invasion of adjacent organs presence of metastases	High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index >30%

14.6. *Histopathology reporting proforma for pancreatic neuroendocrine tumour resections*

Surname..... Forenames..... Date of birth..... Sex.....
 Hospital..... Hospital no..... NHS/CHI no.....
 Date of receipt..... Date of reporting..... Report no.....
 Pathologist..... Surgeon.....

Type of specimen: Whipple's resection
 Partial distal pancreatectomy
 Local resection
 Enucleation
 Pylorus-preserving pancreaticoduodenectomy (PPPD)

Specimen dimensions

Length of lesser curve stomach	mm	Site of tumour	.....
Length of greater curve stomach	mm	Number of tumours	.....
Length of duodenum	..... mm	Maximum tumour dimension	..... mm
Length of gall bladder	..... mm	Distance tumour to nearest cut margin	..... mm
Length of bile duct	..... mm	Named vessel identified	Yes <input type="checkbox"/> No <input type="checkbox"/>
Size of pancreas	..... x x mm	Which vessel?	.....
Other organs	.....	Stent in place	Yes <input type="checkbox"/> No <input type="checkbox"/>

Type of tumour

Well-differentiated NET
 Poorly differentiated NEC (small cell ca)
 Poorly differentiated large cell NEC
 Mixed NET-adenocarcinoma
 Other (specify)

Grade of tumour

G1 (<2 mitoses/10hpf, Ki-67 index ≤5%)
 G2 (2–20 mitoses/10hpf, Ki-67 index >5–20%)
 G3 (>20 mitoses/10hpf, Ki-67 index >20%)
 Actual Ki-67 index %

Peptide hormone content

Immunostaining performed Yes No
 If yes, peptide identified:
 Insulin Glucagon Somatostatin Pancreatic polypeptide Gastrin
 Other (specify).....

Local invasion

pTX Primary tumour cannot be assessed
 pT0: No evidence of primary tumour
 pT1 Microadenoma <5 mm (benign)
 pT1 Tumour limited to the pancreas and size <20 mm
 pT2 Tumour limited to the pancreas and size 20–40 mm
 pT3 Tumour limited to the pancreas and size >40 mm
 pT4 Tumour invading the wall of adjacent large vessels (coeliac axis or superior mesenteric artery),
 stomach, spleen, colon, adrenal gland

For any pT, add (m) for multiple tumours

Metastatic spread

No of lymph nodes present

No of involved lymph nodes

Optional statement of sites of involved node(s)

(pNX regional lymph node status cannot be assessed

pN0 no regional lymph node metastasis

pN1 regional lymph node metastasis)

Vascular invasion Yes No Not assessable

Perineural invasion Yes No Not assessable

Histologically confirmed distant metastasis (pM1):

Yes No If yes, site: (PUL: pulmonary, HEP: hepatic, OSS: osseous)

Background abnormalities

Islet cell microadenomatosis Yes No N/A

Chronic pancreatitis Yes No N/A

Pathological staging

Complete resection at all surgical margins?

Yes, (R0) No, microscopic (R1) No, macroscopic (R2)

If resection incomplete, state involved margin:

TNM

pT pN pM

WHO classification

Microadenoma

Well-differentiated neuroendocrine tumour, grade 1

Well-differentiated neuroendocrine carcinoma, grade 2

Poorly differentiated neuroendocrine carcinoma, grade 3

Signature:..... Date:.....

SNOMED codes: T59000 / M.....