NICE National Institute for Health and Care Excellence

NICE guidance

Selective internal radiation therapy for neuroendocrine tumours that have metastasised to the liver

HealthTech guidance
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Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guidance replaces IPG786.

1 Recommendations

1.1 Use selective internal radiation therapy (SIRT) as an option for neuroendocrine tumours that have metastasised to the liver, with standard arrangements in place for clinical governance, consent and audit.

1.2 Patient selection should be done by a multidisciplinary team with experience in managing neuroendocrine tumours.

1.3 The procedure should only be done in specialist centres by clinicians trained and experienced in delivering SIRT.

1.4 Clinicians should enter details about everyone having this procedure into an appropriate registry.

Why the committee made these recommendations

The evidence shows that SIRT controls the growth of tumours that have metastasised to the liver, and reduces symptoms. There can be serious complications with SIRT, but these are well-recognised and infrequent. For some people with these tumours, SIRT may be better tolerated than other available treatment options. More evidence would help to define which people would benefit the most.

2 The condition, current treatments and procedure

The condition

2.1 Neuroendocrine tumours grow in many organs of the body. The tumours start in cells that release hormones into the bloodstream (neuroendocrine cells). The tumours commonly spread (metastasise) from other organs to the liver, where it may not be possible to remove them with surgery. Some metastatic neuroendocrine tumours produce hormones that can cause carcinoid syndrome. The main symptoms of carcinoid syndrome are flushing of the skin, diarrhoea, fast heart rate and breathlessness. Some people with uncontrolled carcinoid syndrome may develop carcinoid heart disease and mesenteric fibrosis. This can reduce quality of life and prognosis, and limit what treatments can be offered.

Current treatments

2.2 Current treatment options depend on the history, and the clinical and histological presentation of the metastatic neuroendocrine tumours. They include:

- surgical resection
- percutaneous ablation
- systemic chemotherapy
- systemic somatostatin analogues
- peptide receptor radiation therapy
- other intra-arterial therapies such as:
  - transarterial bland embolisation
  - transarterial chemoembolisation

- drug-eluting-bead transarterial chemoembolisation.

The procedure

2.3 In selective internal radiation therapy (SIRT), microspheres containing sources of beta radiation (either the radioactive isotope Yttrium-90 or Holmium-166) are infused through the hepatic artery and carried by blood flow to the vessels that supply the tumour. Infusion through this route minimises damage to healthy liver tissues because they are mainly supplied by the portal vein, whereas the tumours are mainly supplied by hepatic arteries.

2.4 The procedure is done in 2 stages. First, the work-up is done to assess blood supply to the tumour, assess lung shunt, exclude extrahepatic uptake and plan personalised dosimetry. Then during SIRT, the microspheres containing the radionuclide are infused through a catheter placed in the hepatic artery. Catheterisation is done under local anaesthetic.

3 Committee considerations

The evidence

3.1 NICE did a rapid review of the published literature on the efficacy and safety of this procedure. This comprised a comprehensive literature search and detailed review of the evidence from 9 studies reported in 8 publications, which was discussed by the committee. The evidence included 2 systematic reviews and meta-analyses, a large retrospective comparative study, an analysis of international registry data, a small single-arm trial, a retrospective analysis of a small, prospective, UK-based study, and 2 retrospective case series. It is presented in the summary of key evidence section in the overview. Other relevant literature is in the appendix of the overview.

3.2 The professional experts and the committee considered the key efficacy outcomes to be:

- quality of life
- tumour control in the liver
- symptom response
- overall survival
- hepatic progression-free survival.

3.3 The professional experts and the committee considered the key safety outcomes to be:

- mortality
- radiation-induced liver disease
- post-radioembolisation syndrome
- other clinical toxicity

- other biochemical toxicity.

3.4 For auditing the outcomes of this procedure, the key outcomes identified in this guidance can be entered into NICE's audit tool (for use at local discretion), with details of patient selection. This will help to define which people will benefit most from selective internal radiation therapy (SIRT).

3.5 One commentary from a person who has had this procedure was discussed by the committee. They had side effects from the procedure including tiredness, nausea and weight loss. The worst of the side effects lasted 4 to 6 weeks. They remain tired and nauseous for 2 months after treatment and have started to regain weight. They said that the procedure has stopped almost all the carcinoid syndrome symptoms. They have been able to return to their normal activities, which has improved their mental health.

Committee comments

3.6 Experts emphasised that SIRT may be particularly useful for people with large metastatic neuroendocrine tumours who have symptoms of carcinoid syndrome.

3.7 When appropriate, SIRT can be preceded or followed by other treatments including peptide receptor radionuclide therapy, and it can be repeated. In some people, SIRT can open options for alternative treatment afterwards.

3.8 Neuroendocrine tumours that have metastasised to the liver may be more suitable for SIRT than other types of tumour in the liver, because they are usually hypervascular.

3.9 SIRT is likely to be better tolerated than other intra-arterial therapies, because SIRT relies on radiation rather than embolic effect to kill the tumour cells.

3.10 Clinical experts informed the committee that dosimetry methods are evolving.

Update information

Minor changes since publication

January 2026: Interventional procedures guidance 786 has been migrated to HealthTech guidance 720. The recommendations and accompanying content remain unchanged.

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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.