

## NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

### Interventional procedures consultation document

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

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 from other organs to the liver (metastases), where it may not be possible to remove them with surgery. In selective internal radiation therapy (SIRT), tiny radioactive microspheres are injected into the blood vessels that supply the liver tumour. The aim is to kill the tumour cells with as little damage to nearby healthy cells as possible. It may be possible to cure the cancer or, if not, SIRT can be used to reduce tumour size, slow tumour growth or control the symptoms of carcinoid syndrome (a collection of symptoms caused by some neuroendocrine tumours that release hormones).

NICE is looking at selective internal radiation therapy for neuroendocrine tumours metastatic to the liver.

NICE's interventional procedures advisory committee met to consider the evidence and the opinions of professional experts with knowledge of the procedure.

This document contains the [draft guidance for consultation](#). Your views are welcome, particularly:

- comments on the draft recommendations
- information about factual inaccuracies
- additional relevant evidence, with references if possible.

NICE is committed to promoting equality of opportunity, eliminating unlawful discrimination and fostering good relations between people with particular protected characteristics and others.

**This is not NICE's final guidance on this procedure. The draft guidance may change after this consultation.**

After consultation ends, the committee will:

## NICE interventional procedures consultation document, December 2023

- meet again to consider the consultation comments, review the evidence and make appropriate changes to the draft guidance
- prepare a second draft, which will go through a [resolution process](#) before the final guidance is agreed.

Please note that we reserve the right to summarise and edit comments received during consultation or not to publish them at all if, in the reasonable opinion of NICE, there are a lot of comments or if publishing the comments would be unlawful or otherwise inappropriate.

Closing date for comments: 25 January 2024

Target date for publication of guidance: May 2024

## **1 Draft 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 by 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 which can cause

carcinoid syndrome. The main symptoms of carcinoid syndrome are flushing of the skin, diarrhoea, fast heart rate and breathlessness.

## Current treatments

2.2 Current treatment options depend on the history, clinical and histological presentation of 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 radioactive beta-nucleotides (yttrium-90, 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 interventional procedures 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 interventional procedure outcomes audit tool](#) (for use at local discretion), with details of patient selection. This will help to define which people will benefit most from SIRT.
- 3.5 One commentary from a person who has had this procedure was discussed by the committee. They had side effects including tiredness, nausea and weight loss. The worst of the side effects lasted 4 to 6 weeks. They remain tired and nauseous 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 selective internal radiation therapy (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.

Tom Clutton-Brock

Chair, interventional procedures advisory committee

December 2023

ISBN: