

Microwave ablation for primary or metastatic cancer in the lung

HealthTech guidance

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www.nice.org.uk/guidance/htg609

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.

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This guidance replaces IPG469 and IPG716.

1 Recommendations

- 1.1 Evidence on the safety of microwave ablation for treating primary lung cancer and metastases in the lung is adequate but shows it can cause infrequent serious complications. Evidence on its efficacy shows it reduces tumour size. But the evidence on improvement in survival, long-term outcomes and quality of life is limited in quantity and quality. Therefore, this procedure should only be used with special arrangements for clinical governance, consent, and audit or research. Find out what [special arrangements mean on the NICE guidance page](#).
- 1.2 Further research should be randomised controlled trials or disease registry studies. It should report patient selection, disease progression and quality of life, and take account of the effectiveness of managing oligometastatic disease in patients.
- 1.3 Clinicians who want to use microwave ablation to treat primary lung cancer and metastases in the lung should:
 - Inform the clinical governance leads in their healthcare organisation.
 - Give patients (and their families and carers as appropriate) clear written information to support [shared decision making](#), including [NICE's information for the public](#).
 - Make sure that patients (and their families and carers as appropriate) understand the procedure's safety and efficacy, and any uncertainties about these.
 - Audit and review clinical outcomes of all patients having the procedure. The main efficacy and safety outcomes identified in this guidance can be entered into [NICE's audit tool](#) (for use at local discretion).
 - Discuss the outcomes of the procedure during their annual appraisal to reflect, learn and improve.

1.4 Healthcare organisations should:

- Make sure systems are in place that support clinicians to collect and report data on outcomes and safety for everyone having this procedure.
- Regularly review data on outcomes and safety for this procedure.

1.5 People with primary or metastatic lung cancer should be referred to an appropriately constituted multidisciplinary team.

1.6 The procedure should only be done in specialist centres by clinicians with specific training in this procedure.

2 The condition, current treatments and procedure

The condition

- 2.1 Lung cancer is one of the most common types of cancer. The symptoms often do not appear until the disease is at an advanced stage, and the prognosis is generally poor. Cancer that begins in the lungs is called primary lung cancer. There are 2 main types of primary lung cancer: small-cell lung cancer (which is fast growing and can spread quickly) and non-small-cell lung cancer (which usually grows and spreads slowly; this includes squamous cell carcinoma, adenocarcinoma and large-cell carcinoma).
- 2.2 Cancer that starts in one part of the body and spreads via the blood stream to the lungs is known as secondary lung cancer (also called metastatic lung cancer or lung metastasis). Common tumours that metastasise to the lungs include breast cancer, colon cancer, prostate cancer, sarcoma, bladder cancer, neuroblastoma and Wilm's tumour.

Current treatments

- 2.3 NICE's guideline on lung cancer describes the treatment of non-small-cell and small-cell lung cancer. The choice of treatment for primary or metastatic cancer in the lung depends on the type, size, position and stage of the cancer, and the patient's overall health. Common treatments for primary or metastatic cancer in the lung include surgery, chemotherapy, radiotherapy, or a combination of these. Other treatments include photodynamic therapy, thermal ablation, immunotherapy and biological therapy.

The procedure

- 2.4 The procedure is usually done using general anaesthesia, and occasionally using local anaesthesia and sedation. Under imaging guidance, a small probe is advanced through the chest wall and into each targeted lesion. It delivers high-frequency microwave energy to rapidly agitate water molecules in the tissues. This converts energy into heat, which causes tumour necrosis. Patients with larger tumours or multiple lesions may have multiple pulses of energy delivered within a treatment session or have a staged treatment with multiple sessions.
- 2.5 This procedure aims to destroy tumour cells and create localised areas of tissue necrosis with minimal damage to surrounding normal tissues. Microwave ablation is a minimally invasive procedure. It usually lasts 1 to 2 hours with only 5 to 10 minutes of active ablation time.

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 13 sources, which was discussed by the committee. The evidence included 3 systematic reviews and/or meta-analyses, 6 non-randomised comparative studies, 2 case series, 1 case report and 1 review of lung microwave ablation database. 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: disease progression, survival, reduction in tumour size, local recurrence and quality of life.
- 3.3 The professional experts and the committee considered the key safety outcomes to be: pneumothorax, pleural effusion, air embolism, bronchopleural fistula with prolonged air leak and bleeding.
- 3.4 Patient commentary was sought but none was received.

Committee comments

- 3.5 The committee was informed that microwave ablation is quicker and may be better tolerated than other ablation techniques.
- 3.6 The committee was informed that evidence on the efficacy of microwave ablation for primary and metastatic lung cancer is similar to other ablation procedures in terms of tumour size reduction. Other ablation procedures are also associated with similar complications.

- 3.7 The committee was informed that microwave ablation is not used to treat small-cell lung cancer.
- 3.8 This procedure may have a role for patients with primary or metastatic lung cancer who are unable to have surgery or whose tumour is not resectable.
- 3.9 There is more than 1 device available for this procedure.

Update information

Minor changes since publication

January 2026: Interventional procedures guidance 716 has been migrated to HealthTech guidance 609. The recommendations and accompanying content remain unchanged.

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Endorsing organisation

This guidance has been endorsed by [Healthcare Improvement Scotland](#).