

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Health Technology Appraisal

Nivolumab with ipilimumab and chemotherapy for untreated metastatic non-small-cell lung cancer [ID1566]

Final scope

Remit/appraisal objective

To appraise the clinical and cost effectiveness of nivolumab with ipilimumab and standard chemotherapy (platinum-based combination chemotherapy) within its marketing authorisation for untreated metastatic non-small-cell lung cancer.

Background

Lung cancer falls into 2 main histological categories: 85-90% are non-small-cell lung cancers (NSCLC) and 10-15% are small-cell lung cancers¹. NSCLC can be further classified into squamous cell carcinoma and non-squamous cell carcinoma. Around 70% of NSCLC are of non-squamous histology and can be either large-cell undifferentiated carcinoma or adenocarcinoma². Most lung cancers are diagnosed at an advanced stage, when the cancer has spread to lymph nodes and other organs in the chest (locally advanced disease; stage III) or to other parts of the body (metastatic disease; stage IV). In 2018, around 35,200 people were diagnosed with NSCLC in England, and around 56% had stage IIIB or stage IV disease³.

Lung cancer caused over 27,600 deaths in England in 2018⁴. Forty one percent of people with lung cancer survive for more than 1 year after diagnosis⁵.

For most people with NSCLC, the aims of treatment are to prolong survival and improve quality of life. Treatment choices are influenced by the presence of biological markers (such as mutations in epidermal growth factor receptor-tyrosine kinase [EGFR] or anaplastic-lymphoma-kinase [ALK], or programmed death-ligand 1 [PD-L1] status), histology (squamous or non-squamous) and previous treatment experience.

NICE guideline 122 recommends platinum combination chemotherapy (that is, cisplatin or carboplatin, and either docetaxel, gemcitabine, paclitaxel, or vinorelbine) as an option for people with untreated advanced non-squamous NSCLC with a PD-L1 tumour proportion score (TPS) below 50% and no EGFR or ALK mutations. Alternatively, these people may have pemetrexed plus either cisplatin (NICE technology appraisal guidance 181) or carboplatin. For non-squamous NSCLC that has not progressed immediately following initial therapy with a NICE-recommended platinum-based chemotherapy regimen, maintenance treatment with pemetrexed is recommended as an option (NICE TA190 and 402). NICE technology appraisal guidance 584

recommends atezolizumab with bevacizumab, carboplatin and paclitaxel as an option for untreated metastatic non-squamous NSCLC with a PD-L1 TPS below 50% and no EGFR or ALK mutations. NICE technology appraisal guidance 683 recommends pembrolizumab with pemetrexed and platinum chemotherapy as an option for untreated metastatic non-squamous NSCLC with no EGFR or ALK mutations.

For people with untreated advanced squamous NSCLC with a PD-L1 TPS below 50%, NICE guideline 122 recommends gemcitabine or vinorelbine in combination with either carboplatin or cisplatin. NICE technology appraisal guidance 600, which is under review, recommends pembrolizumab with carboplatin and paclitaxel within the Cancer Drugs Fund, as an option for metastatic untreated squamous NSCLC^a.

NICE technology appraisal guidance 531 recommends pembrolizumab monotherapy as an option for untreated PD-L1-positive metastatic NSCLC with a PD-L1 TPS of at least 50% and no EGFR or ALK mutations, regardless of histology.

The technology

Nivolumab (Opdivo, Bristol-Myers Squibb) is a fully humanised IgG4 monoclonal antibody which targets and blocks the PD-L1 receptor, to promote an anti-tumour immune response. It is administered intravenously.

Ipilimumab (Yervoy, Bristol-Myers Squibb) is a recombinant human anti-CTLA-4 monoclonal antibody which blocks the effects of CTLA-4 to enhance T-cell mediated immune responses to tumour cells. It is administered intravenously.

Nivolumab with ipilimumab and 2 cycles of platinum-based chemotherapy has a marketing authorisation in the UK for untreated metastatic NSCLC in adults whose tumours have no sensitising EGFR mutation or ALK translocation.

^a Products recommended for use in the Cancer Drugs Fund after 1 April 2016 should not be considered as comparators, or appropriately included in a treatment sequence, in subsequent relevant appraisals. <https://www.nice.org.uk/Media/Default/About/what-we-do/NICE-guidance/NICE-technology-appraisal-guidance/cancer-drugs-fund/CDF-comparator-position-statement.pdf>

Intervention	Nivolumab with ipilimumab and standard chemotherapy
Population	Adults with untreated metastatic NSCLC without sensitizing EGFR mutations or ALK fusions
Comparators	<p>For adults with non-squamous histology:</p> <ul style="list-style-type: none"> • Pemetrexed in combination with a platinum drug (carboplatin or cisplatin) (for people with adenocarcinoma or large-cell carcinoma only) <ul style="list-style-type: none"> ○ with (following cisplatin-containing regimens only) or without pemetrexed maintenance treatment • Chemotherapy (docetaxel, gemcitabine, paclitaxel or vinorelbine) in combination with a platinum drug (carboplatin or cisplatin) <ul style="list-style-type: none"> ○ with or without pemetrexed maintenance treatment • Atezolizumab with bevacizumab, carboplatin and paclitaxel (for people whose PD-L1 tumour proportion score is between 0% and 49%) • Pembrolizumab (for people whose tumours express PD-L1 with at least a 50% tumour proportion score) • Pembrolizumab with pemetrexed and platinum chemotherapy* <p>For adults with squamous histology:</p> <ul style="list-style-type: none"> • Chemotherapy (docetaxel, gemcitabine, paclitaxel or vinorelbine) in combination with a platinum drug (carboplatin or cisplatin) • Pembrolizumab (for people whose tumours express PD-L1 with at least a 50% tumour proportion score) • Pembrolizumab with carboplatin and paclitaxel (subject to ongoing NICE appraisal)**
<p>* Pembrolizumab with pemetrexed and platinum chemotherapy was added as a comparator after the first appraisal committee meeting because of clinical expert input regarding a change to established clinical practice when the combination moved from the Cancer Drugs Fund to routine commissioning.</p> <p>**Pembrolizumab with carboplatin and paclitaxel has been added as a <i>potential</i> comparator following the first appraisal committee meeting because the ongoing Cancer Drugs Fund review means it may become established clinical practice during this appraisal.</p>	

Outcomes	<p>The outcome measures to be considered include:</p> <ul style="list-style-type: none"> • overall survival • progression-free survival • response rate • adverse effects of treatment • health-related quality of life
Economic analysis	<p>The reference case stipulates that the cost effectiveness of treatments should be expressed in terms of incremental cost per quality-adjusted life year.</p> <p>If the technology is likely to provide similar or greater health benefits at similar or lower cost than technologies recommended in published NICE technology appraisal guidance for the same indication, a cost-comparison may be carried out.</p> <p>The reference case stipulates that the time horizon for estimating clinical and cost effectiveness should be sufficiently long to reflect any differences in costs or outcomes between the technologies being compared.</p> <p>Costs will be considered from an NHS and Personal Social Services perspective.</p> <p>The availability of any patient access schemes for the intervention or comparator technologies will be taken into account.</p> <p>If appropriate, the economic modelling should include the costs associated with diagnostic testing for biological markers (for example PD-L1) in people with NSCLC who would not otherwise have been tested. A sensitivity analysis should be provided without the cost of the diagnostic test. See section 5.9 of the Guide to the Methods of Technology Appraisals.</p>
Other considerations	<p>If evidence allows, subgroup analysis by level of PD-L1 expression will be considered.</p> <p>Guidance will only be issued in accordance with the marketing authorisation. Where the wording of the therapeutic indication does not include specific treatment combinations, guidance will be issued only in the context of the evidence that has underpinned the marketing authorisation granted by the regulator.</p>
Related NICE recommendations	<p>Related Technology Appraisals:</p> <p>Atezolizumab in combination for treating metastatic non-</p>

**and NICE
Pathways**

[squamous non-small-cell lung cancer](#) (2019) NICE Technology Appraisal 584. Review date June 2022.

[Pemetrexed for the first-line treatment of non-small-cell lung cancer](#) (2009) NICE Technology Appraisal 181. Static guidance list.

[Pemetrexed for the maintenance treatment of non-small-cell lung cancer](#) (2010) NICE Technology Appraisal 190. Static guidance list.

[Pemetrexed maintenance treatment for non-squamous non-small-cell lung cancer after pemetrexed and cisplatin](#) (2016) NICE Technology Appraisal 402. Review date April 2019.

[Pembrolizumab for untreated PD-L1-positive metastatic non-small-cell lung cancer](#) (2018) NICE Technology Appraisal 531. Review date 2021.

[Pembrolizumab with pemetrexed and platinum-based chemotherapy for untreated non-small-cell lung cancer](#) (2021) NICE Technology Appraisal 683. Review date 2024.

[Pembrolizumab with carboplatin and paclitaxel for untreated metastatic squamous non-small-cell lung cancer](#) (2019) NICE Technology Appraisal 600. CDF review expected TBC.

Terminated appraisals:

[Atezolizumab with carboplatin and nab-paclitaxel for untreated advanced non-squamous non-small-cell lung cancer \(terminated appraisal\)](#) (2020) NICE Technology Appraisal 618.

Appraisals in development (including suspended appraisals):

[Avelumab for untreated PD-L1 positive non-small-cell lung cancer](#). NICE technology appraisals guidance [ID1261]. Publication date to be confirmed.

[Atezolizumab monotherapy for untreated advanced non-small-cell lung cancer](#). NICE technology appraisals guidance [ID1678]. Publication date June 2021.

[Durvalumab for untreated EGFR-negative, ALK-negative non-small-cell lung cancer](#). NICE technology appraisals guidance [ID1331]. Publication date to be confirmed.

[Durvalumab with tremelimumab for untreated non-small-cell lung cancer with no EGFR- or ALK-positive mutations](#). NICE technology appraisals guidance

	<p>[ID1143]. Suspended.</p> <p>Nivolumab in combination with ipilimumab for untreated PD-L1-positive non-small-cell lung cancer. NICE technology appraisals guidance [ID1187]. Suspended.</p> <p>Nivolumab in combination with platinum-doublet chemotherapy for untreated PD-L1-negative non-small-cell lung cancer. NICE technology appraisals guidance [ID1135]. Suspended.</p> <p>Nivolumab monotherapy for non-small-cell lung cancer. NICE technology appraisals guidance [ID1088]. Suspended.</p> <p>Pembrolizumab for untreated PD-L1 positive non-small-cell lung cancer with at least 1% tumour proportion score. NICE technology appraisals guidance [ID1247]. Suspended.</p> <p>Pembrolizumab with carboplatin and paclitaxel for untreated metastatic squamous non-small-cell lung cancer (CDF Review TA600) NICE technology appraisals guidance [ID1683]. Publication date to be confirmed.</p> <p>Veliparib with carboplatin and paclitaxel for untreated non-squamous non-small-cell lung cancer. NICE technology appraisals guidance [ID1277]. Publication date to be confirmed.</p> <p>Related Guidelines:</p> <p>Lung cancer: diagnosis and management (2019). NICE guideline NG122.</p> <p>Related Interventional Procedures:</p> <p>Microwave ablation for treating primary lung cancer and metastases in the lung (2013). NICE interventional procedures guidance 469.</p> <p>Related Quality Standards:</p> <p>Lung cancer in adults (2019). NICE quality standard 17</p> <p>Related NICE Pathways:</p> <p>Lung cancer (2021) NICE pathway</p>
<p>Related National Policy</p>	<p>The NHS Long Term Plan, 2019. NHS Long Term Plan NHS England (2018) Manual for prescribed specialised services 2018/19 Chapter 105: Specialist cancer services (adults).</p> <p>Department of Health, NHS Outcomes Framework</p>

References

1. [Types of lung cancer](#). Cancer Research UK. Accessed March 2021
2. Howlader N, Noone AM, Krapcho M, Garshell J, Miller D, Altekruse SF, et al. SEER Cancer Statistics Review, 1975-2012, National Cancer Institute. 2015 [Available from: https://seer.cancer.gov/csr/1975_2012/].
3. [National Lung Cancer Audit: Annual report \(for the audit period 2018\)](#) (2021). Royal College of Physicians. Accessed March 2021.
4. [Lung cancer mortality by sex and UK country \(2021\)](#). Cancer Research UK. Accessed March 2021.
5. [Lung cancer survival statistics \(2020\)](#). Cancer Research UK. Accessed March 2021.