NICE National Institute for Health and Care Excellence

Putting NICE guidance into practice

Resource impact report:
Pembrolizumab with pemetrexed and platinum chemotherapy for untreated metastatic non-squamous non-small cell lung cancer (TA683)

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Summary

NICE has recommended pembrolizumab with pemetrexed and platinum chemotherapy (pembrolizumab combination) as an option for untreated metastatic non-squamous non-small cell lung cancer in adults according to specific criteria in the recommendation (see section 1 for further details).

We estimate that:

- Around 2,900 people with untreated metastatic non-squamous non-small cell lung cancer (NSCLC) are eligible for treatment with pembrolizumab combination therapy each year.
- Around 2,100 people will have pembrolizumab combination therapy from year 2023/24 onwards once uptake has reached 73% as shown in table 1.

Table 1 Estimated number of people in England receiving pembrolizumab combination therapy.

	2021/22	2022/23	2023/24	2024/25	2025/26
Uptake rate for pembrolizumab combination (%)	55%	60%	73%	73%	73%
Population receiving pembrolizumab combination each year	1,600	1,800	2,100	2,100	2,100

This report is supported by a local resource impact template because the list price of pembrolizumab has a discount that is commercial in confidence. The discounted price of pembrolizumab can be put into the template and other variables may be amended.

This technology is commissioned by NHS England. Providers are NHS hospital trusts.

1 Pembrolizumab with pemetrexed and platinum chemotherapy (pembrolizumab combination)

1.1 NICE has recommended pembrolizumab combination as an option for untreated, metastatic, non-squamous non-small-cell lung cancer (NSCLC) in adults whose tumours have no epidermal growth factor receptor (EGFR)-positive or anaplastic lymphoma kinase (ALK)-positive mutations only if:

- it is stopped at 2 years of uninterrupted treatment, or earlier if their disease progresses and
- the company provides pembrolizumab according to the commercial arrangement.

1.2 Standard care for untreated, metastatic, non-squamous NSCLC with tumours that have no EGFR-positive or ALK-positive mutations is pemetrexed with carboplatin or cisplatin if tumours are PD-L1 negative, or are PD-L1 positive with a tumour proportion score of less than 50%. Standard care if the tumours express at least a 50% PD-L1 tumour proportion score is pembrolizumab monotherapy.

1.3 Pembrolizumab combination was recommended by NICE for use in the Cancer Drugs Fund in TA557. The results from evidence collected in the Cancer Drugs Fund for the eligible population show that people who have pembrolizumab combination are likely to live longer than those who have pemetrexed chemotherapy but it's not certain by how much. There is no difference in how long people live compared with pembrolizumab monotherapy.

1.4 Retreatment with pembrolizumab is not NHS clinical practice, therefore people who have pembrolizumab combination at first line would not have pembrolizumab at second line. The cost of

this treatment at first line is therefore partly offset by a reduction in the use of pembrolizumab as a second line treatment.

2 Resource impact of the guidance

2.1 We estimate that:

- Around 2,900 people with non-squamous non-small cell lung cancer (NSCLC) are eligible for treatment with pembrolizumab with pemetrexed and platinum chemotherapy each year.
- Around 2,100 people will receive pembrolizumab with pemetrexed and platinum chemotherapy from year 2023/24 onwards once uptake has reached 73% as shown in table 2.

2.2 The current treatment and future uptake figure assumptions are based on clinical expert opinion and are shown in the resource impact template. Table 2 shows the number of people in England who are estimated to have pembrolizumab combination by financial year.

Table 2 Estimated number of people in England receiving pembrolizumab combination using NICE assumptions

	2021/22	2022/23	2023/24	2024/25	2025/26
Uptake rate for pembrolizumab combination (%)	55%	60%	73%	73%	73%
Population receiving pembrolizumab combination each year	1,600	1,800	2,100	2,100	2,100

2.3 This report is supported by a local resource impact template. Pembrolizumab has a commercial arrangement. This makes pembrolizumab available to the NHS with a discount. The size of the discount is commercial in confidence. It is the company's responsibility to let relevant NHS organisations know details of the

discount. The discounted price of pembrolizumab can be put into the template and other variables may be amended. For enquiries about the commercial arrangement please contact: PembrolizumabPAS@msd.com

3 Implications for commissioners

3.1 This technology is commissioned by NHS England. Providers are NHS hospital trusts.

3.2 Pembrolizumab will be available through routine commissioning and there will be a resource impact for specialised commissioning. The technology was previously funded from the Cancer Drugs Fund, but this will stop from 90 days after the publication of the guidance on 10th March 2021.

3.3 Pembrolizumab combination falls within the programme budgeting category 2D: Cancers and Tumours - Lung.

4 How we estimated the resource impact

The population

4.1 Around 38,900 people were diagnosed with lung cancer in 2017 [Office for National Statistics 2019]. Table 3 shows the details of the population with untreated metastatic non-squamous NSCLC who are estimated to be eligible for treatment with pembrolizumab combination therapy.

Table 3 Number of people eligible for treatment in England

Population	Proportion of previous row (%)	Number of people
Adult population		44,263,393
Incidence of lung cancer[1]	0.09	38,900
People who have NSCLC[2]	88.6	34,500
Proportion of NSCLC that is non-squamous[3]	78	26,900
Proportion of people diagnosed with stage IV metastatic disease[2]	49	13,200
Proportion of people receiving chemotherapy and systemic anti-cancer therapy[2]	66	8,700
Proportion of people who have performance status of 0-1[3]	45	3,900
Proportion of people who are not EGFR or ALK mutation positive[4]	75	2,900
Total number of people eligible for treatment with pembrolizumab combination therapy		**2,900**
Total number of people estimated to receive pembrolizumab combination therapy each year from year 2023/24	73	**2,100**

[1] Office for National statistics (2019):
Cancer registration statistics released April 19. ICD-10 code C34
[2]. Annual report (published 2020) | RCP London
[3]. NLCA annual report 2018 | RCP London [Information sheet download]
[4].Mavroudis-Chocholis O, Ayodele L. Non-small cell lung cancer. Decision Resources Group. 2015. Report can be accessed via:
Non-Small-Cell Lung Cancer | Pharmacor | G7 | 2015 | Research & reports | DRG (decisionresourcesgroup.com)

Assumptions

The assumptions used in the resource impact template are provided in table 4.

Table 4 Assumptions made on current and future practice.

First line treatments (untreated people) – people eligible for pembrolizumab in combination		
Current Practice	**Future practice**	**Rationale**
0% of people receive pembrolizumab combination	**73%** of people receive pembrolizumab combination	Estimate based on expert opinion.
28% of people receive pembrolizumab monotherapy	**12%** of people receive pembrolizumab monotherapy	Reduced from 28% because people who have >50% PDL-1 tumour proportion score and who are symptomatic are likely to have pembrolizumab in combination to obtain a quicker response.
52% of people receive pemetrexed with carboplatin	**11%** of people receive pemetrexed with carboplatin	Change shows market share shift to targeted treatments approved for routine use. Some use of chemotherapy predicted in future because people may be contraindicated or unable to tolerate pembrolizumab in combination.
20% of people receive pemetrexed with cisplatin, of whom 58.4% receive pemetrexed maintenance therapy	**4%** of people receive pemetrexed with carboplatin, of whom 58.4% receive pemetrexed maintenance therapy	Change shows market share shift to targeted treatments approved for routine use. Some use of chemotherapy predicted in future because people may be contraindicated or unable to tolerate pembrolizumab in combination.
Total 100%	**Total 100%**	

Table 4 continued: Impact on uptake of second line treatments		
Current practice	**Future Practice**	**Rationale**
40% of people receive pembrolizumab monotherapy	**0%** of people receive pembrolizumab monotherapy	Current practice per trial data: 56% of people who progress after pemetrexed + platinum chem have pembrolizumab monotherapy[1]. In the template this = (1,525+587) x 56% / 2,900 (total number receiving a treatment) = 40% of the eligible population. Future practice is 0% because more effective treatments are recommended at first line either as monotherapy or in combination. It is not clinical practice to retreat with pembrolizumab.
8% of people receive pemetrexed plus carboplatin	**4%** of people receive pemetrexed plus carboplatin	Per trial data, 39.9% of people who currently progress after pembrolizumab monotherapy receive pemetrexed + platinum chemo. This is split pro-rata to those estimated to take up each option per current practice above (i.e. 52/72 pemetrexed +carbo; 20/72 pemetrexed +cisplatin). Future uptake is in favour of pembrolizumab in combination therefore the % of people receiving pemetrexed + platinum reduces in future[1].
3% of people receive pemetrexed plus cisplatin	**1%** of people receive pemetrexed plus cisplatin	See rationale note above.
0% of people receive nintedanib plus docetaxel	**46%** of people who receive pembrolizumab at first line receive nintedanib plus docetaxel subsequently	Per trial data 45.8% of people who progress after pembrolizumab combination therapy receive nintedanib & docetaxel[1].
49% of people are unable to undergo further treatment and receive best supportive care	**49%** of people are unable to undergo further treatment and receive best supportive care	It is assumed people unable to take up a second line treatment have best supportive care[2].
Total 100%	**Total 100%**	

Notes:

[1].45.8%, 56.5% and 39.9% of patients treated with pembrolizumab combination, chemotherapy and pembrolizumab monotherapy, respectively, progress to treatment with subsequent therapies, as per the previous data-cuts from KEYNOTE-1894 and KEYNOTE-02433.

[2]Clinical expert opinion suggests people having second line treatment may increase slightly after having immunotherapy as a first line treatment. This assumption may be amended by users in the template to reflect local estimates.

Administration costs (national tariff 2020/21)

Pembrolizumab combination:

- Pembrolizumab (SB12Z Deliver simple parenteral chemotherapy at first attendance) £159
- Pemetrexed plus cisplatin (first cycle SB14Z Deliver complex chemotherapy including prolonged infusional treatment at first attendance) £478; subsequent cycles (SB12Z see above description) £159
- Pemetrexed plus carboplatin (first cycle SB13Z Deliver more complex parenteral chemotherapy) £319; subsequent cycles (SB12Z see above description) £159

Pemetrexed with platinum chemotherapy:

- Pemetrexed plus carboplatin (first cycle SB13Z Deliver more complex parenteral chemotherapy) £319; subsequent cycles (SB12Z Deliver simple parenteral chemotherapy at first attendance) £159
- Pemetrexed plus cisplatin (first cycle SB14Z Deliver complex chemotherapy including prolonged infusional treatment at first attendance) £478; subsequent cycles (SB12Z see above description) £159
- Pemetrexed maintenance (SB12Z see above description) £159

Nintedanib plus docetaxel (SB12Z see above description) £159

Pembrolizumab monotherapy (SB12Z see above description) £159

About this resource impact report

This resource impact report accompanies the NICE guidance on Pembrolizumab with pemetrexed and platinum chemotherapy or untreated metastatic non-squamous non-small cell lung cancer [TA683] and should be read with it.