# Pembrolizumab offers hope and challenges in cancer care and NHS costs



Roy Bradley, a 90-year-old retired rail engineer from Crewe, Cheshire, faced a daunting cancer diagnosis affecting his lungs and liver, initially believing chemotherapy was his only option and preparing for the worst. Having witnessed his late wife Mary endure a severe two-year chemotherapy battle against pancreatic cancer before her passing, Roy was reluctant to undergo similar treatment. However, his consultant introduced him to pembrolizumab, a revolutionary immunotherapy drug also known by its brand name, Keytruda. This treatment involves a simple wrist cannula delivering an hour-long infusion every three weeks, vastly different from traditional chemotherapy.

Pembrolizumab works by harnessing the body’s immune system to target and attack tumours. Since its NHS approval in 2015 for melanoma, the drug’s use has expanded to treat various cancers, including breast and cervical cancer. Roy began a two-year course of pembrolizumab after a grim prognosis of nine to twelve months with chemotherapy in 2018. Five years post-treatment, he remains clear of cancer and has resumed an active lifestyle, including cycling, charity work, and involvement with local Scouting and church activities. His oncologist, Dr Patricio Serra, described the drug as a “revolution” in cancer treatment, noting survival rates rise significantly with immunotherapy.

Another beneficiary is Jeff Cook, 76, from Northwich, Cheshire, who was diagnosed with stage 4 lung cancer in 2019. Following radiotherapy and a similar pembrolizumab course, Jeff experienced a remarkable recovery, returning to normal daily life shortly after treatment commenced.

Despite the transformative potential of pembrolizumab, the drug comes with a significant financial cost to the NHS. Research based on NHS figures estimates Roy’s treatment costs roughly £52,000 annually. The expense of such branded medicines has surged by over 5% annually, threatening NHS budget stability. Pembrolizumab itself ranks among the NHS’s ten most expensive drugs. Analysis by campaign group Global Justice Now reveals the NHS pays an estimated £775 for a 50mg dose, while production costs are calculated to be as low as £18, indicating mark-ups between 100 and 1,000 times manufacturing costs. The report suggests that if the NHS purchased at production cost, it could have saved over £1 billion.

The pricing and profit strategies of pharmaceutical companies have drawn scrutiny, with critics accusing them of overcharging the NHS and exploiting public funding in drug development. Pembrolizumab’s origins trace back to publicly funded UK institutions, including the Medical Research Council’s Laboratory of Molecular Biology and the not-for-profit charity LifeArc, which played a crucial role in adapting the antibodies for human use. While LifeArc has sold on its stake in the drug, the bulk of profits have accrued to pharmaceutical giant MSD, which reported £19 billion in global revenue from Keytruda in 2023, making it the world’s most profitable drug.

The NHS negotiates confidential discounts with manufacturers, with estimates suggesting average reductions of around 41%, lowering the typical cost per patient to approximately £49,500 per year. However, prices remain higher than in some other countries, such as the Netherlands, where pembrolizumab costs between £33,000 and £41,000 per patient.

Pharmaceutical companies defend their pricing by citing the need to recover investments for research and development, including costly failed trials. Nonetheless, investigations have highlighted practices such as tax avoidance through subsidiaries in low-tax countries, which raise questions about whether these firms pay their fair share. For example, MSD has over 140 subsidiaries in tax-friendly jurisdictions. Similarly, AbbVie, maker of Humira—another high-cost drug for the NHS—is facing legal action in the Netherlands over allegations of excessive pricing.

The secretive nature of pricing negotiations exacerbates doubts about affordability and fairness. Experts argue that lower prices could be achieved while maintaining profits, allowing funds to be redirected toward prevention, staffing, and healthcare infrastructure.

Publicly funded initiatives continue to drive innovation in immunotherapies. The UK government-backed Manifest programme, launched last October under the Francis Crick Institute, aims to accelerate cancer immunology research. However, the ownership of resulting patents and profits remains uncertain.

In response to concerns, a joint statement from the MRC and LifeArc emphasised that while LifeArc reinvests royalties into drug development and diagnostics, specific funding for pembrolizumab’s development was not provided by the MRC. An MSD spokesperson highlighted that all new medicines undergo comprehensive evaluations by NICE and are subject to negotiated price reductions and industry-wide rebates before NHS availability. NHS England stated it utilises strong commercial capabilities to secure access to medicines beneficial for both patients and taxpayers while maintaining partnerships with the life sciences industry.

Nonetheless, health economists caution that balancing incentives for pharmaceutical innovation against NHS budget constraints is complex. Beth Woods, Senior Research Fellow at the University of York’s Centre for Health Economics, stated: “Incentivising the development of new medicines is important, but the right balance needs to be struck—especially when budgets are tight. And the pharmaceutical industry is currently getting too big a slice of the pie.”

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

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2. <https://www.onclive.com/view/fda-grants-pembrolizumablenvatinib-breakthrough-designation-for-rcc> - This URL corroborates the innovative and evolving nature of pembrolizumab in cancer treatment by highlighting its use in combination with other drugs to target various cancers, such as renal cell carcinoma.
3. <https://pubmed.ncbi.nlm.nih.gov/38410102/> - This URL provides evidence of ongoing clinical trials involving pembrolizumab, demonstrating its continued role in cancer treatment research and development, including its use with chemotherapy for certain cancers.
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