Cancer in the workplace: Innovations in cancer management

Willis Towers Watson

This series of articles will explore some of the key innovations in oncology that are expected to turn the tide in the fight against cancer. They will also review the impact of these advances on employee benefit plans that often include cancer related coverage.

What the series will cover:

We will start by exploring why innovation is happening in this field and outlining the progress of current breakthroughs, followed by a review of what to expect in the future and the value of new advances in cancer care to insured employee benefits. We will also review the impact of COVID-19 on cancer services including screening, diagnoses and treatment.

Key points

- Research into therapies that target the root cause of cancers is advancing faster than ever before
- Breakthroughs in genetic engineering and personalised medicine can enable the immune system to kill cancer cells.
- Improving the quality of life with these innovations is critical. Research by Macmillan found 85% of people working when diagnosed said that it was important for them to continue working after diagnosis and 58% said they would have liked to return to work once they were emotionally able.

Notable breakthroughs

Chimeric Antigen Receptor T-cells (CAR-T)

- A targeted form of adoptive cell transfer (ACT) immunotherapy that helps to strengthen the patient's immune system and attack tumour cells. This form of therapy draws upon T-cells, a type of white blood cell that is involved in fighting infection In some instances, these T-cells are unable to recognise tumour cells or fully destroy them. As such, CAR-T therapy aims to improve the tumour killing capability of these cells through genetic engineering.
- The process involves extracting blood from a patient and separating T-cells which are then genetically engineered to produce chimeric antigen receptors (CAR's) on the exterior of the cells.
- These CAR-T cells are infused into the patient and are then able to recognise and bind to a specific protein found on tumour cells, killing the tumour cells through several molecular mechanisms.
- Following the success demonstrated in clinical trials, CAR-T cell therapy has been approved as a treatment option for a small number of cancer types in certain countries such as the UK, United States and Japan and across the EU.

Checkpoint Inhibitors

- The immune system plays a primary role in killing tumour cells. However, tumour cells are often able to avoid checkpoint detection by the immune system, helping them to proliferate.
- Avoidance happens through an interaction between a protein on the immune cells and the receptor that binds with it on tumour cells that are trying to mimic normal healthy cells.
- Checkpoint inhibitor therapy has helped to tackle this avoidance by blocking the interaction between the protein and receptor, helping the immune system to work at full force.
- These anti-cancer drugs have been approved and

used for certain types of cancer in a few countries such as the UK, United States and across the EU.

Gene therapy

- Cancer cells have different genetic makeups from healthy cells. The genetic mutations in cancer cells can also differ between two people with the same type of cancer.
- In some cases, the erroneous fusion of two different genes can lead to the development of tumours.
- The advancements in genetic sequencing and trials of drugs that target specific genetic mutations have shown early stage evidence of tackling cancers.
- This has helped to avoid non-specific chemotherapy or surgical involvement, targeting treatment at the source of cancer growth wherever it is in the body instead.

Genetic sequencing

- Results from the largest ever cancer genome sequencing study, the Pan-Cancer Analysis of Whole Genomes project, published in February 2020 have provided new insights into the causes, development, progression and classification of cancers.
- The same study also revealed similarities between cancers that grow in different organs providing evidence for further research into the application of targeted drugs for different cancers.
- Researchers also found evidence that indicated genetic mutations causing cancers could arise decades before a cancer is detected and diagnosed.
- Advances in genome manipulation using gene editing tools such as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) have improved the identification of target genes.
- CRISPR has also helped to reveal molecular changes expressed in larger biological responses after treatment and identify genes that cause resistance to the targeted drugs.

New innovations

- In January 2020, researchers in the UK discovered a new receptor on immune T-cells, that was non-specific to individual patients. Current T-cell therapy is tailored to each individual patient which has partly driven the cost of this therapy.
- The newly discovered receptor, called MR1, functions similarly to the receptor engineered in CAR T-cell therapy and could form the foundation for T-cell therapy that can be applied to a much broader range of people.
- Preliminary experiments involving MR1 have provided promising results, though, it will require many years of research, testing and clinical trials before a treatment using this discovery can be considered suitable for humans.

"The eradication of TB in the UK only happened after it was recognised in 1952 that the combination of three antibiotics was required to cure patients from TB. It is possible that patients with certain cancers, that are refractory to treatment by conventional adjuvant therapy, may require treatment by a combination of targeted therapy, immunotherapy and gene therapy. The cost of these treatments will however have to be carefully measured against their effectiveness and quality of life if the NHS and private insurance companies are to consider wider implantation".

Professor Gordon Wishart
Chief Medical Officer
Check4Cancer & Visiting Professor of Cancer Surgery at Anglia Ruskin School of Medicine

Key considerations

- Cancer treatments can involve multiple pathways to target tumour cells. This is due to the variances between different types of cancer and even patients with the same form of cancer.
- Whilst examples of personalised medicine are available, these are largely within clinical trial stages. To enable widespread use of such therapies, effective, reliable and cost-effective testing, genetic sequencing and manufacturing infrastructure is required.
- Early results from short term analysis found that patients treated with CAR-T therapy, after receiving conventional therapy, self-reported improved physical, function, social and emotional scores.
- Further evidence is needed to truly assess the effectiveness of such therapies and future innovations on quality of life.
- Cost will also be a challenge for both public and private health insurance sectors, driven by the complex and specialist nature of cancer treatments and rehabilitation for surviving patients.
- As research progresses on the next generation of cancer therapies, these innovations may become more cost effective and accessible for company healthcare plans to support employees and public health programmes.

What to expect in the next article?

- Review of what the future holds for early detection, identification and diagnoses.
- The role of AI in improving cancer screening, testing and clinical decision making.
- How digital health and wearable solutions can improve cancer management for patients and improve quality of life.

To find out more information and guidance in supporting employees during the coronavirus crisis, please contact your Willis Towers Watson consulting team who can help you.

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