



Newsletter

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World No Tobacco Day

World No Tobacco Day brings attention to the global health crisis of tobacco use and its profound impact on cancer. Each year, an estimated 2.4 million tobacco-related cancer deaths occur worldwide, prompting governments, international organizations, and public health advocates to implement initiatives combating tobacco use through preventive strategies and tobacco cessation support. These measures include anti-smoking campaigns, graphic warning labels, education programs, taxation policies, smoking bans, and access to cessation resources. However, sustained progress and overcoming challenges posed by the tobacco industry necessitate ongoing vigilance and a multipronged approach.

Tobacco use is responsible for over 8 million deaths annually, accounting for approximately 22% of all cancer-related deaths globally. Tobacco smoke contains over 70 known carcinogens, leading to DNA damage, mutations, and an increased cancer risk. Lung cancer, primarily caused by smoking, constitutes over 70% of cases, with tobacco use also linked to cancers in the oral cavity, throat, oesophagus, pancreas, bladder, kidney, and cervix. Smokeless tobacco use is a significant risk factor for oral and throat cancers. The scientific consensus on tobacco's detrimental effects emphasizes the urgent need for preventive measures to reduce tobacco-related cancer's impact.

Beyond individual health risks, tobacco use also has profound societal implications. Marginalized communities face higher rates of tobacco use, resulting in increased cancer-related morbidity and mortality, while tobacco addiction imposes a significant economic burden on individuals and society. Addressing tobacco-related cancer requires recognizing the complex interplay of social, economic, and cultural factors contributing to its prevalence. To reduce disparities, it is essential to address structural inequalities and implement tailored public health initiatives that consider the unique challenges faced by different communities.

Inclusive approaches, involving peer support networks and community-based organizations, play a crucial role in fostering smoke-free environments, promoting healthy lifestyles, and empowering individuals to make informed choices about their health.

In India, the real-world implications of tobacco-related cancer are extensive, affecting individuals, families, communities, and healthcare systems. It is estimated that tobacco use is responsible for around 9-13% of all cancer cases in India, with the most common cancers associated with tobacco use being oral cancer, lung cancer, and throat cancer. According to the Indian Council of Medical Research (ICMR), tobacco-related cancers account for more than 40% of all cancers in India. High tobacco use rates among marginalized populations contribute to a differential disease burden, leading to increased cancer incidence, morbidity, and mortality. Disparities in healthcare access, financial resources, educational opportunities, and low awareness result in delayed diagnosis, poorer treatment outcomes, and reduced survival rates, exacerbating existing inequalities. Addressing these challenges requires a comprehensive approach encompassing education, policy interventions, and community-based initiatives.

The Indian government has implemented several programs to tackle tobacco-related oral cancer. One such initiative is the National Tobacco Control Program, which focuses on tobacco control policies, creating awareness campaigns, and strengthening enforcement mechanisms. This program aims to educate the public about the harmful effects of tobacco use, promote tobacco cessation, and enforce regulations to restrict tobacco advertising, smoking in public places, and sale of tobacco to minors. Additionally, the government has established tobacco cessation centres across the country to provide counselling, support, and access to nicotine replacement therapy for individuals looking to quit tobacco use.



Dr. Raj Shankar Ghosh
Public Health Expert

In line with international guidelines, the Indian government adheres to the WHO's MPOWER Framework, which includes measures such as monitoring tobacco use and prevention policies, protecting people from second-hand smoke, offering help to quit tobacco use, warning about the dangers of tobacco, enforcing bans on tobacco advertising, promotion, and sponsorship, and raising taxes on tobacco products. Furthermore, graphic health warnings covering a significant portion of tobacco product packaging have been mandated to increase awareness about the health risks associated with tobacco use. The government has also undertaken school awareness programs to educate students about the dangers of tobacco and promote a tobacco-free lifestyle. Legal measures, including smoking bans in public places and restrictions on tobacco advertising, further contribute to reducing tobacco consumption and mitigating the risk of oral cancer caused by tobacco use. These comprehensive programs and initiatives highlight the importance of education, policy interventions, and accessible healthcare services in combating the prevalence of tobacco-related oral cancer in India.

Despite the Indian government's initiatives to combat tobacco-related oral cancer, significant gaps persist. Stricter enforcement of tobacco control policies, including smoking bans, is needed. Access to tobacco cessation services should be expanded, with a focus on affordability and integration into existing healthcare facilities. Targeted awareness campaigns and education programs are necessary to reach marginalized populations and increase their understanding of tobacco risks and cessation resources. Addressing these gaps requires sustained commitment, collaboration, and resource allocation to strengthen tobacco control efforts and improve oral cancer prevention in India.

Therefore, World No Tobacco Day serves as a reminder to prioritize efforts toward health equity, challenge systemic inequalities, and advocate for inclusive policies. Governments, organizations, healthcare providers, and advocates must work together, developing comprehensive strategies to address tobacco-related challenges. Through collaboration, education, and advocacy, we can strive for a future where everyone, regardless of their social identities, has equal opportunities for a tobacco-free life and improved cancer outcomes.

National Developments



Pipeline News

- **THEME:** Cancer Treatment
- **UPDATE:** Genomics revolutionizes Indian healthcare through precision medicine, liquid biopsies, hereditary cancer screening, pharmacogenomics, rare disorder diagnosis, prenatal testing, and CRISPR technology.

Key Highlights

- Advancements in genomics have paved the way for the development of screening tests for hereditary cancers. By studying specific genetic changes associated with an elevated risk of cancer, these tests can detect various types of cancers. This empowers individuals with a family history of the disease to understand their susceptibility and take appropriate preventive measures. Additionally, pharmacogenomics explores how genetic variations influence an individual's response to medication. Precise genomic information enables healthcare professionals to select the most suitable medication and dosage, minimizing side effects and optimizing treatment outcomes.

- Genomics has played a vital role in the diagnosis and treatment of rare disorders. Genetic testing has significantly expedited the diagnostic process, providing patients with rare diseases access to tailored treatment options. Furthermore, large-scale research studies and collaborations in genomics have enhanced our understanding of disease patterns and brought relief to affected families. Additionally, genomic sequencing has enabled non-invasive prenatal testing, allowing for early detection of genetic disorders in unborn babies without the need for invasive procedures and associated risks.
- To fully harness the potential of genomics, policy implications are essential. Investment in robust genomics infrastructure is crucial to support research and collaboration in the field. Establishing regulatory frameworks ensures the responsible and ethical use of genomic information in healthcare. Awareness and education initiatives are needed to educate healthcare professionals and the public about the benefits and implications of genomics. Ensuring equitable access and affordability of genomic advancements is vital to address healthcare disparities. Lastly, integrating genomics into healthcare systems is key to realizing the full potential of genomics in improving patient outcomes.

Pipeline News

- **THEME:** Cancer Treatment
- **UPDATE:** Tata Memorial Centre, Mumbai, pioneers proton beam therapy, a targeted radiation treatment with fewer side effects, enhancing cancer care in India.

Key Highlights

- Tata Memorial Centre in Mumbai offers proton beam therapy, becoming the first government facility in India to provide this advanced radiation treatment for specific cancers.
- Proton beam therapy utilizes protons instead of X-rays, allowing for targeted treatment with fewer side effects.
- Implementation of the therapy faced delays due to space constraints and the COVID-19 pandemic.
- Proton beam therapy is available in around 92 centers globally, with the Apollo Proton Cancer Centre in Chennai being the first in South Asia.

- The treatment is costlier than traditional therapy, with some patients at Tata Memorial receiving it for free while others pay a reduced rate. Proton therapy has shown clinical benefits in various cancers, including pediatric, central nervous system, head and neck, bone, prostate, and soft tissue tumors. Adequate investment and maintenance are necessary for sustained operation of proton therapy facilities.

Pipeline news

■ **THEME:** Cancer Treatment

■ **UPDATE:** India's affordable HPV vaccine launch aims to combat cervical cancer through improved accessibility, screening programs, and awareness.

Key Highlights

- The Serum Institute of India is preparing to launch CER-VAVAC, the country's first indigenous and affordable human papillomavirus (HPV) vaccine, to combat cervical cancer in women. Despite a decline in cervical cancer incidence and mortality rates over the past three decades, India still has the highest number of cases in Asia. A Lancet study revealed that India accounts for 23% of total cervical cancer deaths in Asia, emphasizing the significant concern.
- The highly effective HPV vaccine targets HPV infections, the main cause of cervical cancer, and is recommended for individuals aged 9 to 14, with administration possible up to age 45. Regular cervical cancer screening, including the Pap smear test, is essential for early detection and treatment of precancerous changes in the cervix. Risk factors for cervical cancer include smoking, weakened immune system, family history, multiple sexual partners, and early sexual activity.

- The launch of an indigenous and affordable HPV vaccine is expected to increase accessibility and vaccination rates, leading to a substantial reduction in cervical cancer cases in India. By addressing both prevention through vaccination and early detection through screening, the aim is to alleviate the burden of cervical cancer and enhance the overall well-being of women across the country.

Policy Insights

■ **THEME:** Cancer Care and Treatment

- **UPDATE:** India government focuses on establishing cancer care centers nationwide, enhancing access to primary, secondary, and tertiary care, strengthening AIIMS oncology departments, and partnering for quality treatment.

Key Highlights

- The government of India plans to establish 19 state cancer centers and 20 tertiary care cancer centers across the country.
- The focus is on strengthening primary, secondary, and tertiary care centers to address the rising number of cancer patients.
- Efforts are underway to enhance oncology departments in AIIMS (All India Institutes of Medical Sciences) and establish AIIMS centers in every state.
- The inauguration of Cancer Centres of America (CCA) in Nashik marks the collaboration between CCA and the Ashoka Group to provide high-quality cancer treatment in north Maharashtra.
- A 24x7 free cancer helpline is available for the entire state, enabling access to cancer experts for consultations.

Pharma and Medical Device

■ **THEME:** Cancer Treatment

- **UPDATE:** AstraZeneca Pharma India secures DCGI approval for import and marketing of trastuzumab deruxtecan, a breakthrough cancer drug for HER-2 positive metastatic breast cancer.

Key Highlights

- AstraZeneca Pharma India has received approval from the Drug Controller General of India (DCGI) for the cancer drug trastuzumab deruxtecan to treat metastatic breast cancer.
- The approval is based on the results of a Phase III trial called DESTINY Breast 03, which demonstrated the efficacy of trastuzumab deruxtecan in HER2-positive breast cancer patients.
- Trastuzumab deruxtecan is approved in over 40 countries and has shown to be effective in treating HER2-positive breast cancer.
- The approval provides a significant clinical advancement and expands treatment options for patients with HER2-positive breast cancer in India.

Pharma and Medical Device

- **THEME:** Cancer Innovation
- **UPDATE:** Kokilaben Dhirubhai Ambani Hospital in Mumbai introduces PanPredict Lung Cancer, a genetic testing tool for enhanced lung cancer care and risk assessment, analyzing predictive genes and mutations.

Key Highlights

- Mumbai's Kokilaben Dhirubhai Ambani Hospital introduces PanPredict Lung Cancer tool for early identification of cell mutations in lung cancer patients.
- The tool assesses 11 predictive genes for mutations and fusions, providing multi-genetic markers for potential treatment options.
- The hospital's real-time PCR assay screens for 167 hotspot mutations or fusions of 11 genes, enabling personalized treatment based on National Comprehensive Cancer Network (NCCN) guidelines.
- Test results are accurate, quick, and released within 10 days, facilitating precision medicine and tailored treatment.
- Germline cancer panel testing is also available, analyzing cancer-related genes associated with increased risks of developing various types of cancer.

Pharma and Medical Device

- **THEME:** Cancer Innovation
- **UPDATE:** ICMR and NCG join forces to revolutionize cancer care in India through clinical trials and affordable therapies, fostering innovation and improved treatment options.

Key Highlights

- The Indian Council of Medical Research (ICMR) has signed a Memorandum of Agreement (MoA) with the National Cancer Grid (NCG), an initiative of the Indian government through the Department of Atomic Energy and the Tata Memorial Centre. The MoA aims to promote clinical trials with a specific focus on developing affordable therapies for India-specific cancers and common cancers in India.
- The agreement includes joint funding for multicentric, multi-disciplinary, interventional trials targeting common or unique cancers.
- The National Cancer Grid's objective is to establish a network of cancer centers, research institutes, patient groups, and charitable institutions across India.
- The NCG aims to develop uniform standards of patient care, provide specialized training and education in oncology, and facilitate collaborative research in basic, translational, and clinical aspects of cancer. Currently, the National Cancer Grid has a network of over 270 hospitals across India..

Policy Insight

- **THEME:** Cancer Prevention
- **UPDATE:** Meghalaya faces high cancer rates, primarily attributed to tobacco use, necessitating immediate awareness campaigns and preventive measures.

Key Highlights

- Meghalaya in India faces a significant cancer burden, with an incidence rate of 131 cases per lakh population. Tobacco use among adults (47%) and adolescents (34%) contributes to this high prevalence. Esophageal cancer is particularly prominent, affecting 71.2 individuals per lakh, surpassing the national average by over 10 times. Tobacco, alcohol, and betel nut consumption are the main factors driving esophageal cancer rates in the state.
- Preventing esophageal cancer in Meghalaya relies on addressing the use of tobacco, alcohol, and betel nut. Dr. Caleb Harris highlights the preventability of this cancer by targeting these risk factors. Positive outcomes have been observed through initiatives like the Tobacco-Free Educational Institutions (ToFEI) program, which reduces tobacco use among children and young adults. However, comprehensive interventions extending beyond youth are necessary to combat cancer effectively in Meghalaya.

- Raising awareness, educating the public, and implementing preventive measures are crucial to address the high cancer rates in Meghalaya. By targeting the root causes, particularly tobacco, alcohol, and betel nut consumption, significant progress can be made in reducing the cancer burden and improving the overall health of the population.

Pharma and Medical Device

■ **THEME:** Cancer Treatment

■ **UPDATE:** Rakuten Medical receives approval for a global Phase 3 trial of photoimmunotherapy for recurrent head and neck cancer in India.

Key Highlights

- Rakuten Medical, Inc. has received permission from the Indian Central Drugs Standard Control Organization (CDSCO) to conduct a global Phase 3 clinical trial in India for its photoimmunotherapy treatment, Alluminox, using ASP-1929. The trial will focus on patients with locoregional, recurrent head and neck squamous cell carcinomas (HNSCC).
- Leading medical institutions in India, including the Tata Memorial Centre and Narayana Health, will participate as study sites.
- The Phase 3 trial, designated as ASP-1929-301, is already ongoing in multiple countries, including the United States and Taiwan, with a total of 275 patients expected to be enrolled globally, including Indian patients. Head and neck cancer is a significant health concern in India, accounting for approximately 25% of all new cases worldwide, with the widespread use of chewing tobacco being a contributing factor.

- The Alluminox treatment using ASP-1929 is a conjugation of cetuximab, an antibody, and IRDye 700DX, a light-activatable dye, developed on Rakuten Medical's Alluminox platform. ASP-1929 binds to the epidermal growth factor receptor (EGFR), which is highly expressed in head and neck cancers, and is locally activated by non-thermal red light, leading to selective cell killing.
- The Phase 3 trial will evaluate the efficacy and safety of ASP-1929 in patients who have previously failed or progressed on at least two lines of therapy and are ineligible for surgery or radiation. Key endpoints of the study include progression-free survival, overall survival, and objective response rate.

International Developments



Pharma and Medical Device

- **THEME:** Cancer Diagnosis
- **UPDATE:** AI tool identifies cancer on CT scans, improving diagnosis and treatment outcomes.

Key Highlights

- Researchers have developed an AI tool that accurately identifies cancerous growths on CT scans. The tool outperforms current methods, showing higher efficiency and effectiveness.
- Its development involved experts from the Royal Marsden NHS foundation trust, the Institute of Cancer Research, London, and Imperial College London.
- Early detection of cancer is crucial, and the AI tool aims to expedite diagnosis and fast-track patients to treatment. The AI model achieved an AUC of 0.87 in predicting cancer risk, surpassing the current Brock score (0.67) and comparable to the Herder score (0.83).
- Implementation in healthcare systems requires further testing, as the study is still in its early stages.
- The AI tool has the potential to streamline CT scan analysis and improve early detection and treatment outcomes, especially for lung cancer.

Pipeline News

- **THEME:** Cancer Research
- **UPDATE:** Scientists discover manipulating healthy brain cell-cancer cell communication slows/halts glioblastoma growth, improving treatment options.

Key Highlights

- Scientists have made a pathbreaking discovery that could revolutionize the treatment of brain cancer. The communication between healthy brain cells and cancerous cells can be manipulated to slow down or halt tumor growth.
- The findings are particularly significant for patients with glioblastoma, the most fatal form of adult brain cancer.
- A team of scientists led by Saritha Krishna, an Indian researcher, discovered the hyperactivity of tumor cells and its impact on cognitive decline and patient survival. They identified a commonly used anti-seizure drug, gabapentin, that effectively reduces tumor cell hyperactivity and inhibits further growth.
- This discovery opens up possibilities for developing more effective treatment methods for glioblastoma. The hijacking of brain circuitry by cancer cells suggests potential for developing drugs and neuromodulation techniques to disconnect neuronal linkups and halt tumor growth.

Policy Insight

■ **THEME:** Cancer Treatment

■ **UPDATE:** Amid Israel-Gaza conflict, cancer patients face treatment delays due to closed crossings and power plant closure.

Key Highlights

- Over 200 patients, mostly with cancer, in Gaza are unable to leave for urgently needed treatment due to the closure of crossings by Israel during the ongoing conflict. The sole power plant in Gaza, which supplies about half of the territory's electricity, is at risk of closure in three days, exacerbating the humanitarian crisis.
- Cancer patients in Gaza are facing potentially life-threatening delays in receiving treatment, leading to potential deaths.
- Gaza's hospitals already face severe shortages of medical equipment and medicines due to the blockade and internal political divisions. Patients and their relatives will face additional delays in accessing treatment as they will need to apply for new Israeli permits to leave Gaza once the hostilities end.

- The reduction in electricity generation in Gaza's power plant will affect vital facilities such as hospitals, waste pumps, treatment plants, and water wells.
- The closure of crossings by Israel and the threat of rocket fire have brought normal life to a halt for millions of people in both Gaza and Israel, causing significant economic and humanitarian impact.

Pharma and Medical Device

- **THEME:** Cancer Treatment
- **UPDATE:** FDA approves Genmab-AbbVie blood cancer therapy, expanding treatment options and AbbVie's product pipeline.

Key Highlights

- FDA approves AbbVie and Genmab's blood cancer therapy, epcoritamab, for advanced large B-cell lymphoma.
- Epcoritamab is the first FDA-approved therapy for this disease, affecting 150,000 people annually.
- Epkinly, the brand name for epcoritamab, has a list price of \$37,500 per month.
- Approval expands AbbVie's product pipeline and mitigates competition for its flagship drug, Humira.
- Analysts predict epcoritamab to reach peak sales of \$2.75 billion globally based on positive mid-stage study data.

Pipeline News

- **THEME:** Cancer Treatment
- **UPDATE:** AstraZeneca's Tagrisso-chemotherapy combination shows promising results in late-stage trial for lung cancer treatment.

Key Highlights

- AstraZeneca's cancer drug, Tagrisso, in combination with chemotherapy, has shown promising results in a late-stage trial for treating a type of lung cancer.
- Patients receiving the combined treatment demonstrated a meaningful improvement in progression-free survival compared to those treated with Tagrisso alone.
- The trial focused on patients with locally advanced or metastatic epidermal growth factor receptor-mutated non-small cell lung cancer.
- Susan Galbraith, executive vice president of AstraZeneca's oncology R&D division, highlighted Tagrisso's potential as a new treatment option in the first-line setting, extending the time patients live without disease progression.
- Analysts at Barclays have raised concerns about potential competition, particularly with Johnson & Johnson's drug, Rybrevant, currently undergoing a head-to-head trial.

Policy Insight

■ **THEME:** Cancer Prevention

■ **UPDATE:** US experts recommend starting breast cancer screening at age 40, with biennial screenings, to improve outcomes and address disparities.

Key Highlights

- The US Preventive Services Task Force (USPSTF) is proposing new guidelines that suggest women should start preventative mammograms at age 40 and undergo regular screenings every other year.
- The task force believes that adopting these recommendations could lead to a 19% reduction in breast cancer-related deaths among American women.
- Breast cancer is the second most common cancer among women in the US, and approximately 13% of American women will be diagnosed with breast cancer at some point in their lives.
- The new guidelines highlight the importance of earlier screening for black women, who are 40% more likely to die from breast cancer compared to white women. The recommendations specifically apply to women with an average risk of breast cancer or those with risk factors such as dense breast tissue.
- The proposed guidelines differ from those in the UK and Canada, where screenings typically start at age 50.

Policy Insight

■ **THEME:** Cancer Treatment

■ **UPDATE:** Young cancer patients face anxiety and depression during chemotherapy, but 41% don't seek mental health support, emphasizing awareness and increased assistance.

Key Highlights

- Data from the charity Young Lives vs Cancer reveals that 41% of young cancer patients seek no mental health support, despite experiencing anxiety (90%) and depression (70%) during chemotherapy.
- Former cancer patients emphasize the need for increased awareness of the impact of treatment on mental health, highlighting the challenges of returning to normalcy and the importance of support even after hair regrowth.
- Personal stories illustrate the struggles faced by young cancer patients in coping with mental health issues post-treatment, and how outlets like running and talking to understanding individuals can aid in the recovery process.

Pipeline News

■ **THEME:** Cancer Research and Innovation

■ **UPDATE:** First Arab woman astronaut, Rayyanah Barnawi, joins Saudi Arabia's historic space mission, advancing cancer research and showcasing national commitment.

Key Highlights

- Rayyanah Barnawi and Ali al-Qarni will become the first Saudi Arabian astronauts to go to the International Space Station, representing Saudi Arabia's maiden space mission. The mission aims to conduct ground-breaking scientific experiments in microgravity and live-stream educational exercises to Saudi youngsters.
- The initiative strengthens Saudi Arabia's position in space exploration, boosts research facilities, and aligns with the Vision 2030 ambitions for space development.
- The inclusion of Barnawi, a biomedical researcher, brings a focus on cancer stem cell and breast cancer research during the mission. Rayyanah Barnawi's participation in Saudi Arabia's maiden space mission highlights the importance of research and exploration in the field of cancer, particularly in relation to breast cancer and stem cell research.
- The mission's focus on scientific experiments in microgravity offers valuable opportunities to develop new methods for understanding and treating cancer, ultimately contributing to advancements in cancer research.

- The international collaboration involved in the space mission provides a platform for knowledge sharing and exchange of ideas, benefiting the global cancer research community. The achievements of Barnawi and the inclusion of cancer-related research in the mission showcase the multidisciplinary nature of cancer studies and emphasize the significance of innovative approaches to cancer research and treatment.

Pipeline News

■ **THEME:** Cancer Treatment

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Pharma and Medical Device

■ **THEME:** Cancer Treatment

■ **UPDATE:** Belgian scientists create personalized diagnostic test for brain cancer, potentially enhancing treatment decisions and patient outcomes.

Key Highlights

- Belgian scientists at KU Leuven University have developed a new diagnostic test for brain tumors. The test helps determine the most effective treatment for individual patients, avoiding ineffective treatments.
- Brain cancers, such as glioblastoma, are aggressive and comprised of different types of cancer cells, leading to high relapse rates and low survival rates.
- The new method utilizes biopsy-extracted tumor cells to test different treatment options.
- Further clinical studies are needed before the test can be used on human patients. The researchers aim to expand the test to include more treatment options and explore its application in pediatric brain tumor. Setting up a centralized test center in Europe is proposed to provide treatment advice to local doctors.
- The study's results were published in the Cellular and Molecular Life Sciences Journal.

Pipeline News

■ **THEME:** Cancer Treatment

■ **UPDATE:** Study shows personalized mRNA vaccine may prevent tumor recurrence after pancreatic cancer surgery, improving outcomes and survival.

Key Highlights

- In a small study, 16 pancreatic cancer patients were treated with a tailored mRNA vaccine after tumor removal, and half of the patients did not experience relapse during the 18-month trial period. The use of mRNA technology in pancreatic cancer treatment is considered a decisive breakthrough and a significant step towards developing individualized cancer vaccines.
- The vaccine was created by sequencing the tumor tissue's genome, identifying specific mutations, and producing an mRNA-based vaccine to induce an immune reaction against these neoantigens.
- The study's findings need to be confirmed through larger clinical trials, but there is optimism regarding the correlation between immune response induction and longer-term survival.

Pancreatic cancer is challenging to treat due to late detection, lack of early detection methods, constant changes in the cancer, and individual variations among patients' tumors.

- The vaccine's efficacy surprised scientists, as pancreatic cancer is typically categorized as a "cold tumor" that does not respond well to immunotherapy.

The study's limitations include the small sample size, short observation period, absence of a control group, and the need for further optimization of neoantigen selection. Practical considerations, such as production times, costs, and accessibility of the vaccine outside specialized centers, still need to be addressed. While more research and development are necessary, the mRNA vaccine for pancreatic cancer could be a significant step in transforming current treatment approaches.



**WE THANK YOU FOR YOUR
CONTINUED SUPPORT IN OUR
EFFORTS IN FIGHT AGAINST CANCER.**

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