

# HISTOTRIPSY: DESTROYING CANCER TUMORS WITH SOUND WAVES

From: Chris Wark: Author of "Chris Beat Cancer"

**Histotripsy is an innovative, non-invasive therapeutic technique that employs focused ultrasound waves to mechanically disintegrate cancerous tumors without the use of heat or ionizing radiation.**

This method offers a promising alternative to traditional cancer treatments, potentially reducing side effects and recovery times.

## Mechanism of Action

Histotripsy utilizes high-intensity ultrasound pulses to create microbubbles within the targeted tumor tissue. The rapid expansion and collapse of these bubbles generate mechanical forces that fragment the tumor cells into acellular debris, which the body can then reabsorb. This precise targeting minimizes damage to surrounding healthy tissues and critical structures such as blood vessels and bile ducts. <https://www.youtube.com/watch?v=ksq-yYrwkSM> [5-minute video].

## Clinical Trials and Efficacy

Several clinical trials have evaluated the safety and efficacy of histotripsy, particularly for liver tumors:

- **THERESA Study:** This first-in-human feasibility trial treated eight patients with primary and metastatic liver tumors. The study reported successful tumor ablation in all cases without device-related adverse events, demonstrating the procedure's safety and predictability.
- **#HOPE4LIVER Trial:** Conducted across multiple centres in the United States and Europe, this trial involved 44 participants with 49 liver tumors. The results showed a technical success rate of 95%, with major complications in only 7% of cases, supporting the early clinical adoption of histotripsy for liver cancer treatment.

These studies indicate that histotripsy is a safe and effective treatment for liver tumors, with success rates comparable to or exceeding those of existing local therapies.

## Regulatory Approval and Clinical Adoption

In October 2023, the U.S. Food and Drug Administration (FDA) granted clearance for the use of histotripsy in treating liver tumors. Following this approval, the technology has been rapidly adopted in clinical settings across the United States and internationally. As of December 2024, histotripsy has been utilized to treat approximately 800 patients, with availability in 18 U.S. states, the United Arab Emirates, and Hong Kong. It's not available in Australia.

## Potential Advantages

- **Non-Invasive:** Histotripsy is delivered externally, eliminating the need for incisions and reducing the risk of infection and recovery time.
- **Precision:** The technique spares surrounding healthy tissues and critical structures, potentially allowing treatment of tumors in challenging locations.
- **Immune Activation:** Preclinical studies suggest that histotripsy may stimulate an immune response against cancer cells, potentially aiding in the treatment of metastatic disease.

## Cost Considerations

By way of example, in the United State the cost of histotripsy treatment can vary based on factors such as healthcare provider, geographic location, and insurance coverage. As of August 2024,

# HISTOTRIPSY: DESTROYING CANCER TUMORS WITH SOUND WAVES

From: Chris Wark: Author of "Chris Beat Cancer"

Medicare in the United States reimburses the procedure at an average rate of \$17,500. Potential patients should consider consult with their healthcare providers and insurance companies [and travel agent at present] to obtain accurate cost estimates tailored to their specific circumstances.

## Downsides, Risks, and Contraindications

- Tumour Size Limitations → Most effective for tumours  $\leq 3$  cm; large tumours need further study.
- Proximity to Critical Structures → Caution required when tumours are near blood vessels, nerves, or sensitive organs.
- Limited Availability → Only available in select medical centres.

## Future Directions

Ongoing research is exploring the application of histotripsy for other tumor types, including kidney, prostate, and pancreatic cancers. Additionally, studies are investigating the potential synergistic effects of combining histotripsy with immunotherapies to enhance systemic anti-tumor responses.

In summary, histotripsy represents a promising advancement in cancer treatment, offering a non-invasive, precise, and effective option for tumor ablation. While further research is necessary to fully establish its long-term efficacy and broader applications, current clinical outcomes are encouraging.

In Australia there is currently a group "Change.org" seeking to influence the Australian Government to adopt the technology. They have an online petition with more information at:

<https://www.change.org/p/establish-histotripsy-treatment-accessibility-in-australia?signed=true>

## Peer-Reviewed Research & Scholarly Articles

Below are some published scientific papers discussing histotripsy:

- Zhou, Y., & Xu, Z. (2023). Research progress and clinical evaluation of histotripsy  
<https://pmc.ncbi.nlm.nih.gov/articles/PMC10113074/>
- Maxwell, A. D., Wang, T. Y., Yuan, L., Duryea, A. P., et al. (2011). Cavitation clouds created by shock scattering from bubbles during histotripsy.  
<https://asa.scitation.org/doi/10.1121/1.3624820>
- Vlaisavljevich, E., Lin, K. W., Maxwell, A., Warnez, M. T., et al. (2015). Effects of ultrasound frequency and tissue stiffness on the histotripsy intrinsic threshold for cavitation. <https://iopscience.iop.org/article/10.1088/0031-9155/60/6/2271>

Source: <https://www.chrisbeatcancer.com/histotripsy-destroying-cancer-tumors-with-sound-waves/>