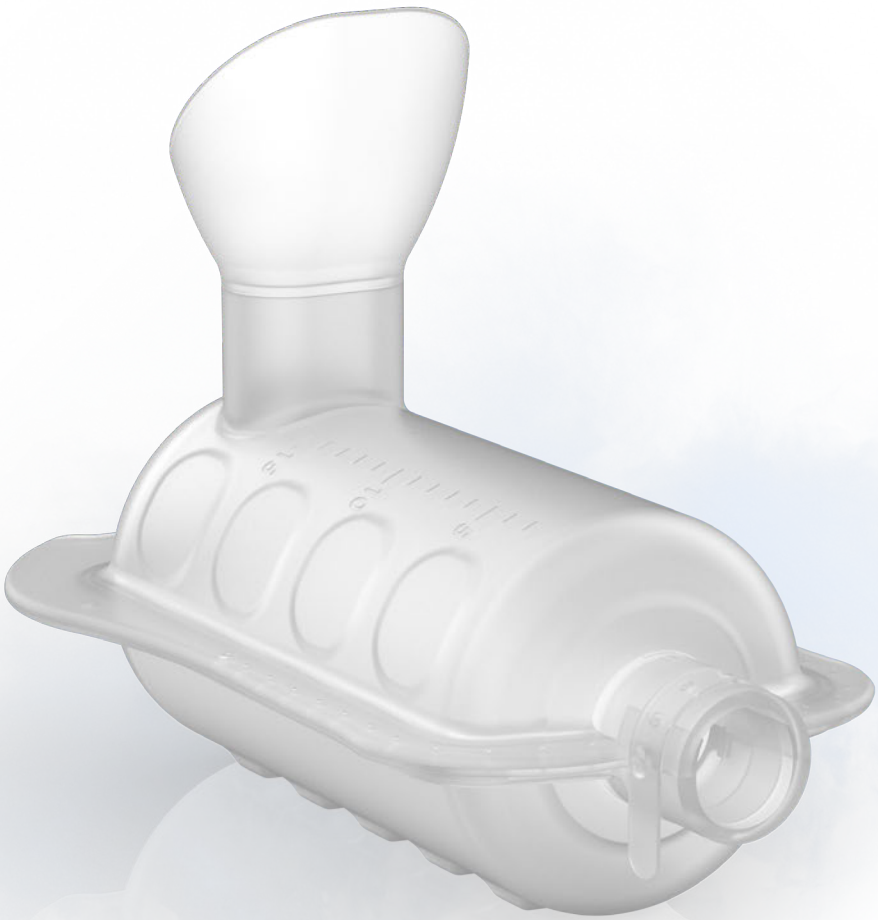
UNITED ORTHOPEDIC®

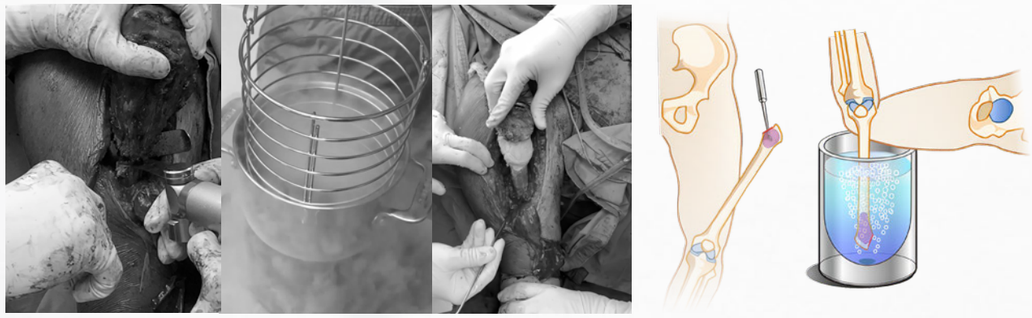
Freezing Tank

Orthopedic Surgical Device for Tumor



Cryosurgery in Bone Tumor Treatment

Liquid nitrogen cryosurgery is an established adjuvant method in bone tumor management, including selected malignant bone tumor reconstruction procedures. It expands the treatment margin by freezing residual tumor cells, causing cell death. Pedicle freezing, among different techniques, treats the tumor-bearing bone while preserving anatomical continuity, potentially supporting structural integrity and biological reconstruction.[1,2]



Conventional free freezing technique vs pedicle freezing technique

Technical Limitations of Conventional Pedicle Freezing in Cryosurgery

Pedicle freezing is a technique-sensitive procedure that requires complex intraoperative handling, including limb positioning and repeated liquid nitrogen refilling, making outcomes highly dependent on surgical experience. The effective freezing zone is difficult to define intraoperatively, as nitrogen vapor obscures visualization and the visible boundary may not reflect the true ablation margin. Complete immersion of complex anatomical regions is also challenging and may require additional manipulation or osteotomy, while liquid nitrogen levels are difficult to monitor. These limitations may be more pronounced in anatomically complex sites such as the distal femur, potentially affecting the consistency of cryogenic exposure.[3-5]

Pedicle freezing technique in clinical practice

Enhanced Control in Cryosurgery with Freezing Tank

The Freezing Tank system is designed to improve the control and consistency of cryosurgical procedures by providing a contained and conformable environment for liquid nitrogen application during intraoperative orthopedic procedures. Constructed from medical-grade silicone, the system provides a sealed containment environment for handling cryogenic medium while supporting more stable coverage of the target bone and reducing reliance on free-pouring techniques. This approach supports more predictable cryogenic exposure, particularly in anatomically complex regions.

The flexible design allows adaptation to patient-specific geometry, facilitating application while helping to minimize uncontrolled dispersion and leakage of the cryogenic medium.

Controlled Cryogenic Exposure System

The Freezing Tank provides a controlled interface for applying cryogenic medium to the target anatomical site. Its enclosed design supports localized treatment by containing cryogenic medium within a defined area, reducing uncontrolled dispersion and improving procedural consistency.

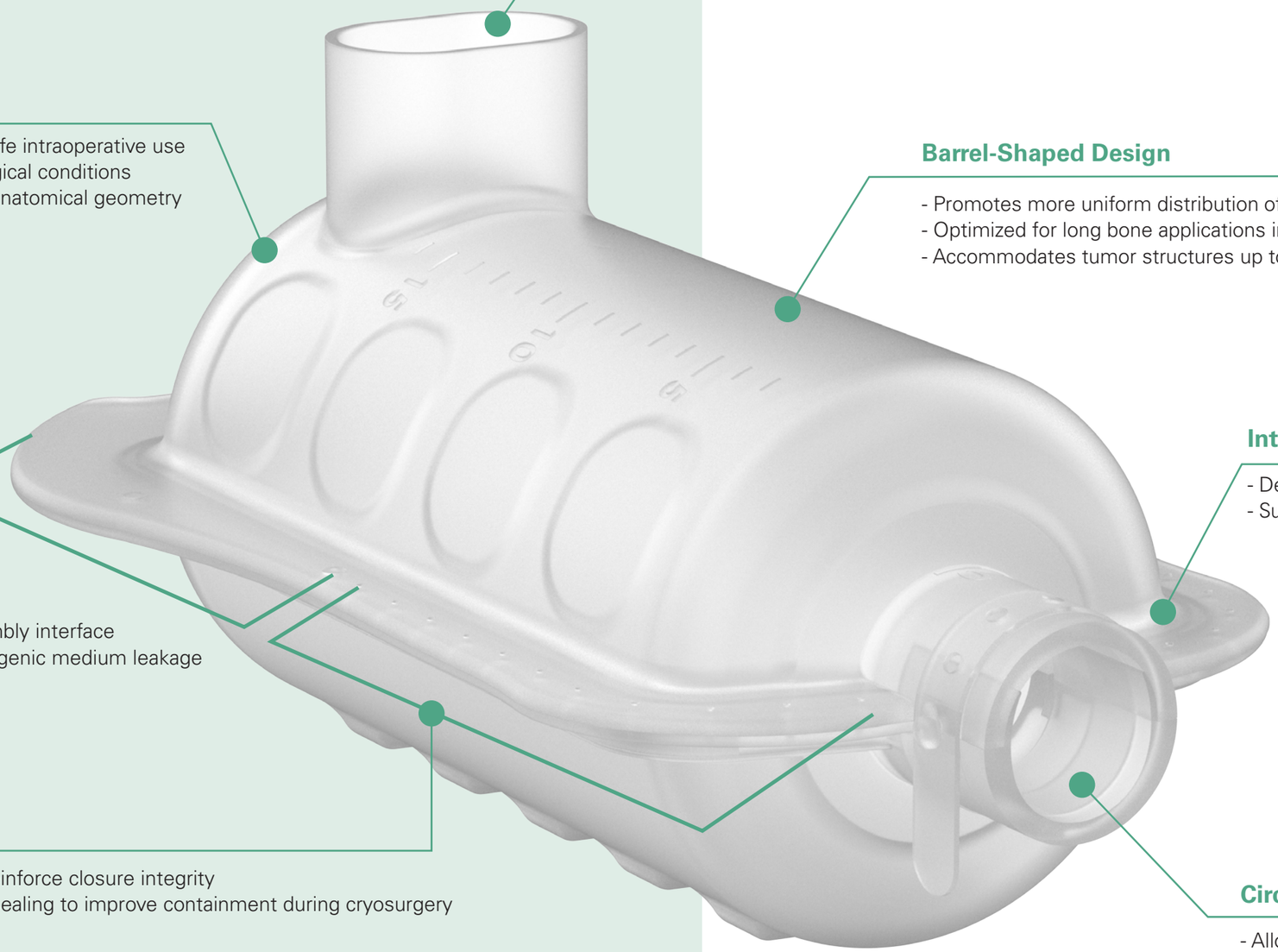
Top Filling Port

- Facilitates controlled delivery of cryogenic medium into the chamber
- Optional silicone funnel and Distributor support precise handling

Distributor

Medical-Grade Silicone

- Ensures biocompatibility and safe intraoperative use
- Designed to withstand cryosurgical conditions
- Flexible structure conforms to anatomical geometry



Barrel-Shaped Design

- Promotes more uniform distribution of cryogenic medium around the target bone
- Optimized for long bone applications in cryosurgery
- Accommodates tumor structures up to 11 cm in diameter and 22 cm in length

Closed-End Design

- Minimizes the required assembly interface
- Reduces potential risk of cryogenic medium leakage

Interlocking Groove Sealing

- Designed to enhance sealing at the interface
- Supports effective containment of the cryogenic medium

Multiple Suture Holes

- Allows additional fixation to reinforce closure integrity
- Supports surgeon-controlled sealing to improve containment during cryosurgery

Circular Entry Opening

- Allows passage of long bone segments while maintaining a close interface
- Opening diameter of 42 mm accommodates shafts wrapped with Sofra-Tulle

Order Information

	Catalog Number	Description
	FZT	Freezing Tank Container
	DL2000	Double-layer Insulation Cylinder
	DIS	Cryo-Gel Distributor with Ladle

References

1. Tsuchiya H. et al. (2010). Pedicle frozen autograft reconstruction in malignant bone tumors. J Orthop Sci. 15(3):340-9.
2. Shimozaki S. et al. (2014). Pedicle versus free frozen autograft for reconstruction in malignant bone and soft tissue tumors of the lower extremities. J Orthop Sci. 19(1):156-63.
3. Hindiskere S. et al. (2020). What are the challenges and complications of sterilizing autografts with liquid nitrogen for malignant bone tumors? A preliminary report. Clin Orthop Relat Res. 478(11):2505-2519.
4. Kammoun T. et al. (2022). Feasibility and safety of single-probe cryoablation with liquid nitrogen: an initial experience in 24 various tumor lesions. Cancers. 14(21):5432.
5. Torigoe T. et al. (2012). Pedicle freezing with liquid nitrogen for malignant bone tumour in the radius: a new technique of osteotomy of the ulna. J Orthop Surg. 20(1):98-102.

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