

# trūFreeze®

Spray Cryotherapy

## GI INTERVENTION FOR CHALLENGING BARRETT'S ESOPHAGUS



**A GUIDE FOR MANAGING  
BARRETT'S ESOPHAGUS  
WITH SPRAY CRYOTHERAPY**

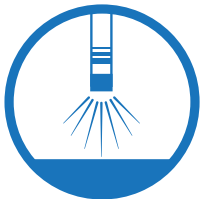
 **STERIS**



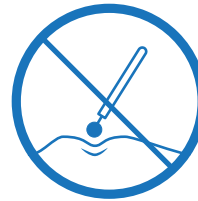
# Patient Benefits

## Liquid Nitrogen Spray Cryotherapy is an Option for Challenging Barrett's Patients

The trūFreeze® Spray Cryotherapy System is clinically proven to be effective in treating patients suffering from refractory Barrett's Esophagus (BE) after treatment with radiofrequency ablation (RFA).<sup>1,2</sup>



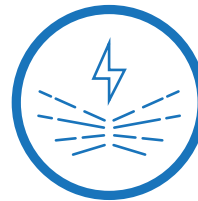
**Effective Ablation**  
Page 3



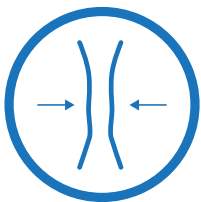
**No Device Tissue Contact**  
Page 7



**Treatment Durability in Challenging Barrett's Cases**  
Page 6



**Less Post Procedure Pain**  
Page 8



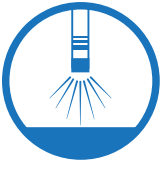
**Minimal Strictures**  
Page 7



**Patients Can Continue Blood Thinners**  
Page 8

“Endoscopic cryotherapy may be considered as an alternative modality in patients unresponsive to radiofrequency ablation... A systematic review reported CE-D and CE-IM rates of 76% and 46% in patients with dysplastic BE refractory to initial RFA who were treated with spray cryotherapy.”<sup>3</sup>

— ACG Guidelines



# Effective Ablation

**Liquid Nitrogen Cryotherapy is the Coldest Cryogen and Has Been Used for Decades to Ablate Benign and Cancerous Lesions**

## HIGH GRADE DYSPLASIA

*Bruce Greenwald, MD University of Maryland, Baltimore, MD*

**PATIENT:** 76 year old woman with benign esophageal disease progressed to low grade dysplasia and then to high grade dysplasia over a period of three years, at which point two Liquid Nitrogen Spray Cryotherapy (LNSC) procedures were performed. Biopsies at three month follow-up showed normal squamous mucosa and gastric tissue.<sup>4</sup>



- A. July 2014: C0M3 benign esophageal disease.
- B. July 2014: During LNSC procedure.
- C. December 2014: 3 months after second LNSC procedure, biopsies show normal gastric tissue and normal squamous mucosa.

SCAN to watch  
how trūFreeze®  
technology works



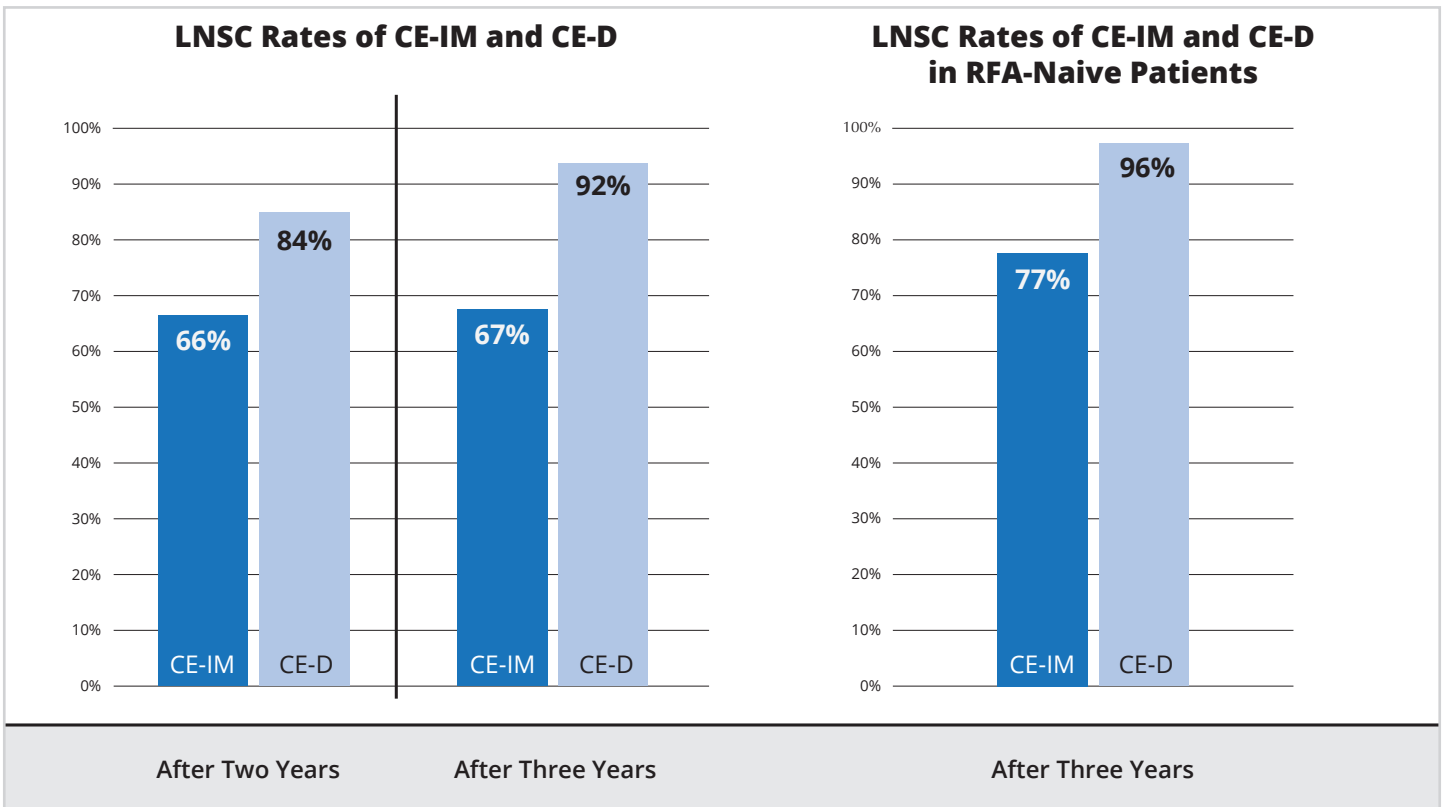
“Spray Cryotherapy based multimodal endoscopic therapy can **achieve very high CE-IM (75%) and CE-D (>98%) rates in a high-risk population** with esophageal dysplasia and/or neoplasia.”<sup>1</sup>

— Kaul et al

# Liquid Nitrogen Spray Cryotherapy Is Safe and Effective in Eradication of Dysplastic Barrett’s Esophagus: Final Results from the U.S. Multicenter, Prospective Spray Cryotherapy Registry

Swathi Eluri, Vivek Kaul, Walter Coyle, Shivangi Kothari, Virendra Joshi, John Dumot, Bruce Greenwald, Nicholas J. Shaheen, et al.

“Given that rates of strictures and complications were also low in this large sample size with substantial follow-up time, the study findings suggest that LNSC is safe and effective in treating neoplastic Barrett’s Esophagus. LNSC may be effective in Barrett’s Esophagus treatment algorithms, both as initial therapy, and as salvage therapy after failure to attain CE-IM with RFA, or in those with advanced dysplasia and early-stage neoplasia who would benefit from the greater depth of treatment penetration offered by LNSC compared to RFA.”<sup>5</sup>  
 — Eluri et al.



Nearly 33% of the sample had previously attempted RFA before cryotherapy, and these patients had CE-D rates of over 80%, demonstrating efficacy of “salvage” LNSC in this group, who tend to have limited alternate treatment options.<sup>5</sup>

# Research has shown that 10-33% of BE Patients are Refractory to RFA<sup>1,6,7</sup>

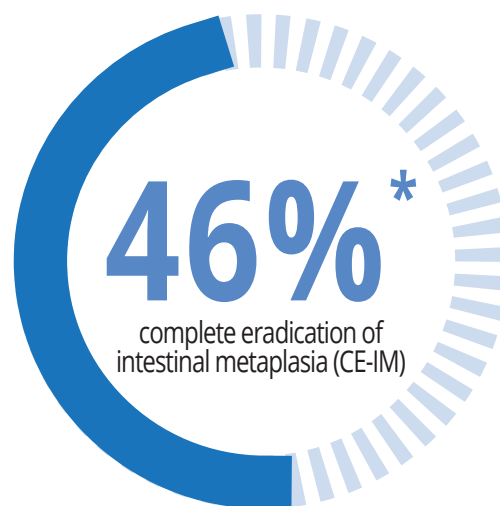
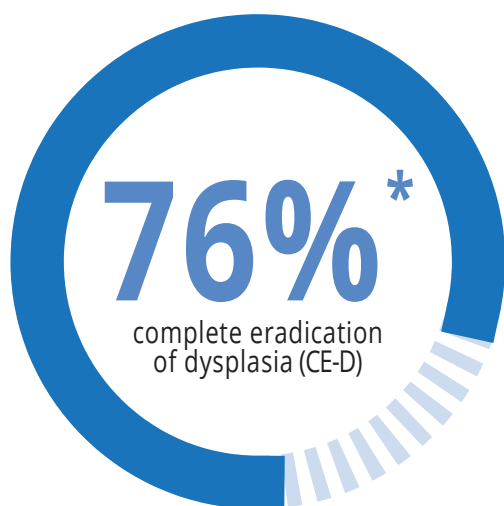


“RFA is technically challenging in patients who have a tortuous esophagus, significant esophageal stricturing or nodular BE. Spray cryotherapy is not significantly limited by these anomalies.”<sup>8</sup>

— Tariq et al.

## LNSC in Challenging Barrett's Cases<sup>9</sup>

\* data represents refractory RFA patients



“Patients with persistent disease after RFA represent a challenging cohort in which cryotherapy may offer a distinctly favorable efficacy and safety profile.”<sup>9</sup>

— Visrodia et al.

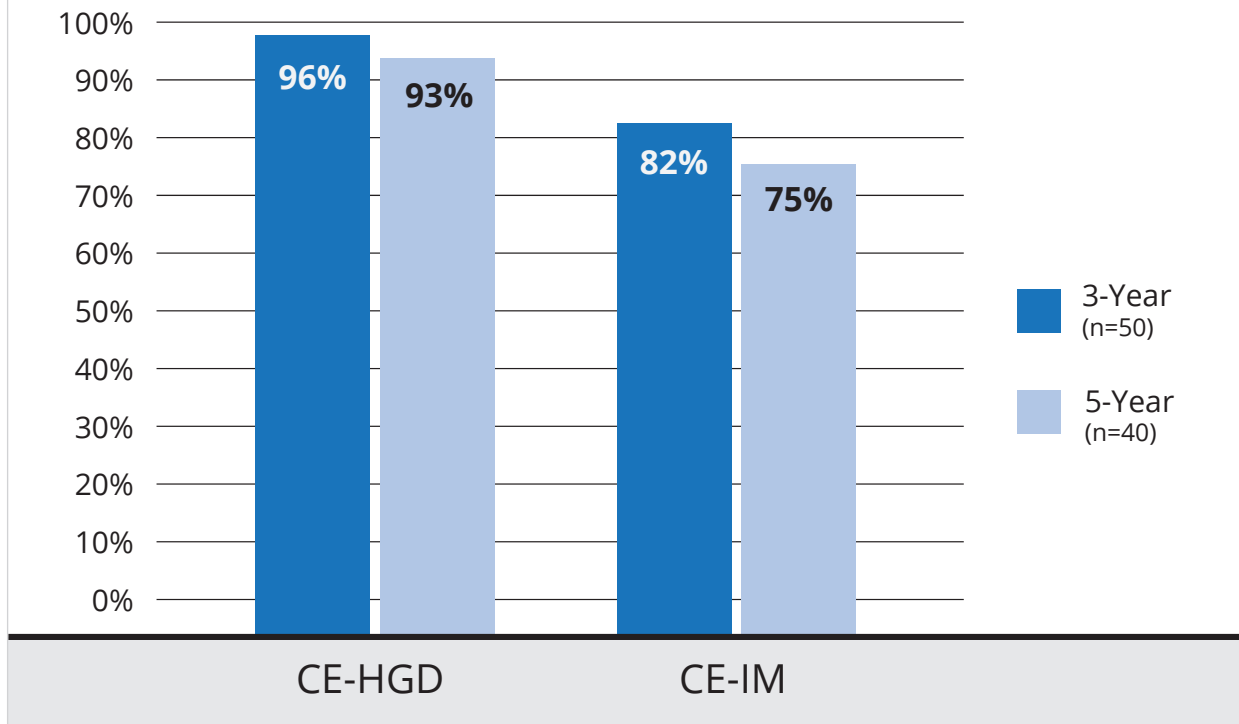


# Treatment Durability

In Challenging Barrett's Cases

## Liquid Nitrogen Spray Cryotherapy Can Successfully Eradicate Dysplasia and Intestinal Metaplasia in Treatment Naive and Refractory Barrett's Patients <sup>10</sup>

LNSC complete eradication rates for Barrett's esophagus high-grade dysplasia, dysplasia, and intestinal metaplasia at 3-year and 5-year follow-up, allowing for interval touch-up therapy. CE-HGD, complete eradication of high-grade dysplasia; CE-IM, complete eradication of intestinal metaplasia <sup>10</sup>

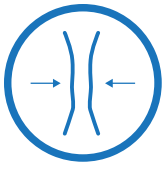


“The majority of patients treated [with Spray Cryotherapy] **maintain CE-HGD, CE-D, and CE-IM at 5 years.**” <sup>10</sup>  
 — Ramay et al.

**trūFreeze<sup>®</sup>**  
 Spray Cryotherapy

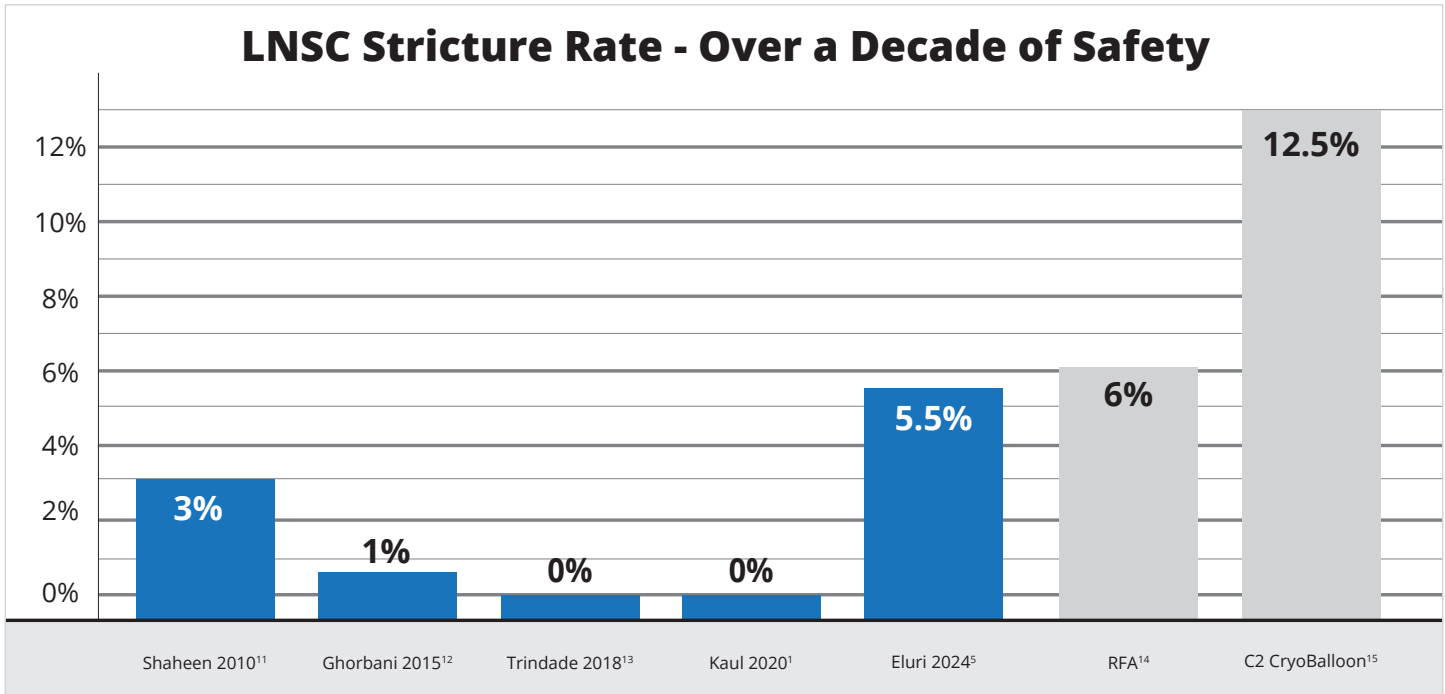
SCAN to watch a case video





# Minimal Strictures

## Lower Reported Post Treatment Stricture Rates Compared to Other Ablative Therapies



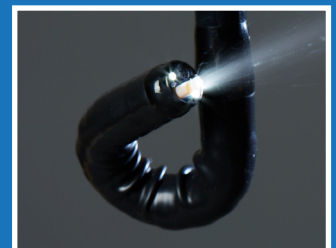
“*Spray Cryotherapy penetrates deeper into the tissue with less injury to the tissue architecture. This subsequently has a lower risk of stricture formation and postprocedural discomfort compared to heat-based ablative modalities.*”<sup>8</sup>

— Tariq et al.



## No Device Tissue Contact

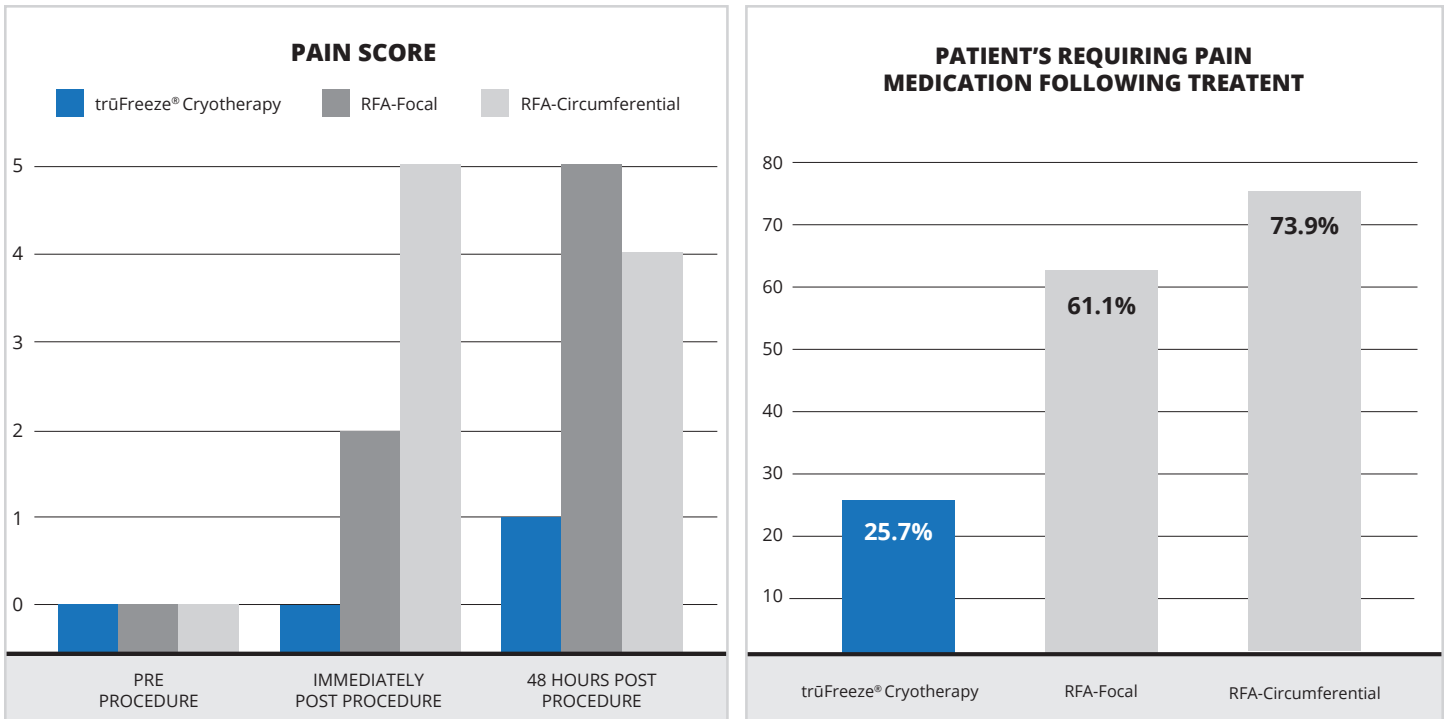
Spray Cryotherapy is a non-contact ablation that allows you to treat irregular tissue, tortuous anatomy, and has the ability to treat in retroflex.





## Less Post Procedure Pain

Patients Experience Less Pain Following LNSC Compared to Other Ablative Therapies<sup>16</sup>



## Patients Can Continue on Blood Thinners

Patients can remain on blood thinners while being treated with LNSC.<sup>17</sup>

- This multicenter study, which includes the largest known data set of esophageal LNSC cases evaluated for bleeding risk, **confirms that major bleeding complications of LNSC use are extremely rare.** These data strongly support current practice theory that **antithrombotic therapy can be administered without interruption in patients undergoing esophageal ablation with LNSC.**

“Spray cryotherapy has been successfully preformed on patients with bleeding diathesis or anticoagulation”<sup>8</sup>

— Tariq et al.

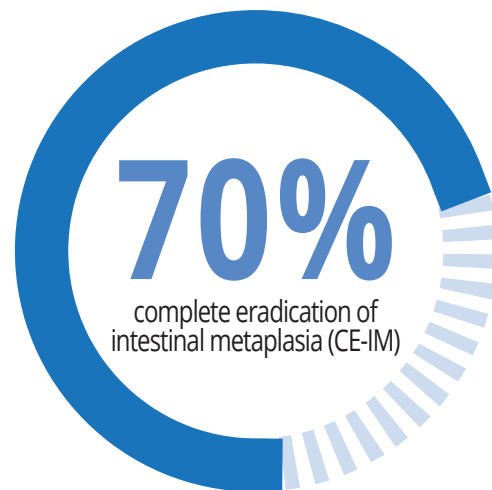
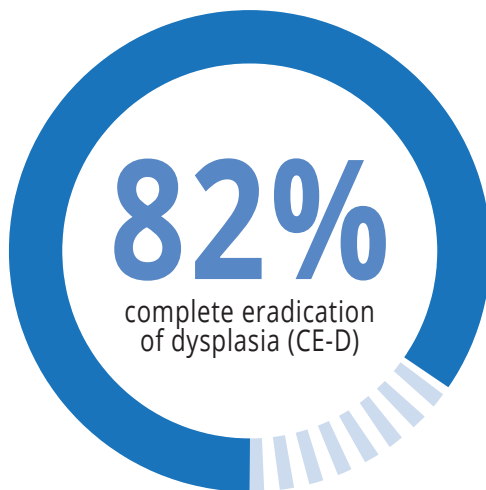
# Spray Cryotherapy

For Early Esophageal Cancer

**NCCN Guidelines Recommend Endoscopic Resection, EMR or ESD, Followed by Ablation for T1a Esophageal Cancers** <sup>18</sup>

## EMR + SPRAY CRYOTHERAPY FOR EARLY CANCER <sup>13</sup>

22/27 patients (82%) achieved complete eradication of dysplasia (CE-D) after cryotherapy, and 19/27 patients (70%) achieved complete eradication of intestinal metaplasia (CE-IM).



“Several retrospective studies have demonstrated that **endoscopic resection [EMR or ESD] and endoscopic ablation procedures are effective treatment options for select patients with Barrett’s esophagus and early-stage esophageal or esophagogastric junction (EGJ) cancers.**” <sup>18</sup>

— NCCN Guidelines

**DON'T HAVE  
CRYOTHERAPY?**

Learn more about trūFreeze® Cryotherapy:

Visit: [steris.com/trufreeze](https://steris.com/trufreeze)

E-mail: [trufreeze@steris.com](mailto:trufreeze@steris.com)

# References

---

1. Kaul V, Bittner K, Ullah A, & Kothari S. Liquid nitrogen spray cryotherapy-based multimodal endoscopic management of dysplastic Barrett's esophagus and early esophageal neoplasia: retrospective review and long-term follow-up at an academic tertiary care referral center. *Dis Esophagus*. 2020; 33:1-6. DOI: <https://doi.org/10.1093/dote/doz095>
2. Sengupta N, Ketwaroo G, Bak D, et al. Salvage cryotherapy after failed radiofrequency ablation for Barrett's esophagus-related dysplasia is safe and effective. *Gastrointestinal Endoscopy* 2015; 82:443-448. DOI: <https://doi.org/10.1016/j.gie.2015.01.033>
3. American College of Gastroenterology (ACG) Guidelines. <https://gi.org/guidelines/>
4. Bruce Greenwald, MD. Case Report: truFreeze Spray Cryotherapy – High Grade Dysplasia. Data on file at STERIS. Document: [www.steris.com/Greenwald-High Grade Dysplasia](http://www.steris.com/Greenwald-High Grade Dysplasia)
5. Eluri S, Kaul V, Coyle W, et al. Liquid Nitrogen Spray Cryotherapy Is Safe and Effective in Eradication of Dysplastic Barrett's Esophagus: Final Results from the US Multicenter, Prospective Spray Cryotherapy Registry. *Gastrointestinal Endoscopy*, January 2024; DOI: <https://doi.org/10.1016/j.gie.2024.01.023>
6. Sprung B, Granato C, Kothari S, et al. Role of Spray Cryotherapy and Wats in Dysplastic Barrett's Esophagus Refractory to Radiofrequency Ablation. *Gastrointestinal Endoscopy* 2015; 81:AB507-AB508. DOI: <https://doi.org/10.1016/j.gie.2015.03.1744>
7. Ketwaroo G, Sengupta N, Sethi S, et al. Salvage Cryotherapy Is a Safe and Effective Therapy for Patients Who Have Persistent or Recurrent Dysplasia After Radiofrequency Ablation for Dysplastic Barrett's Esophagus. *Gastrointestinal Endoscopy* 2014; 79:AB501-AB502. DOI: <https://doi.org/10.1016/j.gie.2014.02.781>
8. Tariq R, Enslin S, Hayat M, et. al. Efficacy of Cryotherapy as a Primary Endoscopic Ablation Modality for Dysplastic Barrett's Esophagus and Early Esophageal Neoplasia: A Systematic Review and Meta-Analysis. *Cancer Control* 2020; 27:1. DOI: <https://doi.org/10.1177/1073274820976668>
9. Visrodia K, Zakko L, Singh S, et al. Cryotherapy for persistent Barrett's esophagus after radiofrequency ablation: a systematic review and meta-analysis. *Gastrointestinal Endoscopy* 2018; 87(6):1396-1404.e1. DOI: <https://doi.org/10.1016/j.gie.2018.02.021>

10. Ramay F, Cui Q, & Greenwald B. Outcomes after liquid nitrogen spray cryotherapy in Barrett's esophagus-associated high-grade dysplasia and intramucosal adenocarcinoma: 5-year follow-up. *Gastrointestinal Endoscopy* 2017; 86:P626-632. DOI: <https://doi.org/10.1016/j.gie.2017.02.006>
11. Shaheen N, Greenwald B, Peery A, et al. Safety and efficacy of endoscopic spray cryotherapy for Barrett's esophagus with high-grade dysplasia. *Gastrointestinal Endoscopy* 2010; 71:P680-685. DOI: <https://doi.org/10.1016/j.gie.2010.01.018>
12. Ghorbani S, Tsai F, Greenwald B, et al. Safety and efficacy of endoscopic spray cryotherapy for Barrett's dysplasia: results of the National Cryospray Registry. *Diseases of the Esophagus* 2016; 29:P241-247. DOI: <https://doi.org/10.1111/dote.12330>
13. Trindade A, Pleskow D, Sengupta N, et al. Efficacy of liquid nitrogen cryotherapy for Barrett's esophagus after endoscopic resection of intramucosal cancer: A multicenter study. *Journal Gastroenterology and Hepatology* 2018; 33:461-465. DOI: <https://doi.org/10.1111/jgh.13909>
14. Shaheen N, Sharma P, Overholt B, et al. Radiofrequency ablation in Barrett's esophagus with dysplasia. *New England Journal of Medicine* 2009; 360:2277-2288. DOI: <https://doi.org/10.1056/NEJMoa0808145>
15. Canto M, Trindade A, Abrams J, et al. Multifocal Cryoballoon Ablation for Eradication of Barrett's Esophagus-Related Neoplasia: A Prospective Multicenter Clinical Trial. *The American Journal of Gastroenterology*, 2020 115(11):1879-1890. DOI: <https://doi.org/10.14309/ajg.0000000000000822>
16. Solomon S, Tindade A, Kothari S, et al. Evaluation of Pain and Dysphagia in Patients Undergoing Cryoablation or Radiofrequency Ablation for Barrett's Esophagus: A Prospective Multicenter Assessment. *Gastrointestinal Endoscopy* 2017; 85:AB562. DOI: <https://doi.org/10.1016/j.gie.2017.03.1297>
17. Sharma N, Perisetti A, Leibowitz R, et al. Liquid Nitrogen Spray Cryotherapy in The Esophagus is Performed with Minimal Bleeding Risk Regardless of Concurrent Antithrombotic Therapy. *Gastrointestinal Endoscopy* 2022; 95:AB373-AB374. DOI: <https://doi.org/10.1016/j.gie.2022.04.950>
18. National Comprehensive Cancer Network Guidelines Version 1.2022 Esophageal and Esopagogastric Junction Cancers. DOI: <https://www.nccn.org/guidelines/guidelines-detail?category=1&id=1433>

# trūFreeze<sup>®</sup>

Spray Cryotherapy

©2024 STERIS. All rights reserved.  
All company and product names are trademarks of  
STERIS, its affiliates or related companies,  
unless otherwise noted.

762023 Rev. A



STERIS  
5960 Heisley Road  
Mentor, OH 44060-1834 - USA  
Customer Service: 800-548-4873