Image Guided Percutaneous Renal Cryoablation
Cryoablation is a well-established and accepted therapy for kidney cancer treatment\(^2\)\(^-\)\(^4\)

Cryoablation is a superior ablative modality with unique radiographic visibility
- Distinct iceball visibility and real-time treatment monitoring optimize control of the ablation\(^5\)\(^,\)\(^6\)
  - CT or MRI imaging throughout the procedure, with intraprocedural adjustments as required, ensures complete coverage of the tumor and desired tissue margin\(^6\)\(^,\)\(^7\)
- Control of the iceball size and growth can avoid damage to adjacent non-target tissue\(^6\)

Renal cryoablation oncologic outcomes are excellent, with:
- Oncologic outcomes comparable to partial nephrectomy (PN) and superior to radiofrequency ablation (RFA)\(^8\)
- Local control after a single treatment (92 – 100%)\(^1\)\(^,\)\(^7\)\(^-\)\(^10\)
- Durability with low incidence of tumor recurrence (mean 26 months follow-up with 1% recurrence)\(^11\), and
- Low risk of metastatic progression (0 – 1%)\(^12\)\(^,\)\(^13\)

Cryoablation is not limited by renal tumor location and size
- A wide range of tumor sizes can be treated\(^1\)\(^,\)\(^5\)\(^,\)\(^11\)\(^,\)\(^14\)
- Anterior masses and central masses can be successfully ablated\(^1\)\(^,\)\(^15\)\(^,\)\(^14\)
- Tumors near the ureter or bowel may be safely managed and treated\(^14\)
- The iceball can be sculpted to the tumor shape\(^5\)\(^,\)\(^6\)

Images courtesy of David J. Breen, MD, Clinical Radiology Department
Southampton University Hospital, Southampton, UK
Percutaneous renal cryoablation procedure notes:

- Regional or local anesthesia can be used\(^7,10,11,17\)
- The ablation zone should extend to a margin of 5 – 10 mm surrounding the tumor\(^12\)
- Multiple cryoablation needles should be placed to sculpt a precise ablation zone and to fully cover the tumor\(^11\)
- Ice from adjacent needles will coalesce to form a large iceball\(^1\)
- Two freeze-thaw cycles are typically performed\(^5\)
- Image guidance throughout a procedure ensures complete tumor coverage
  - Target: image guidance for precise placement of cryoablation needles and thermal sensors
  - Monitor: intraprocedural images to determine coverage of target tissue
  - Control: treatment adjustments throughout the procedure optimize treatment and minimize damage to non-target tissue
- Post procedure imaging assesses technical success\(^11\)
- Early follow up images (within three months) often exhibit iceball extension beyond tumor margins\(^5,11,15\)
- Subsequent images to assess efficacy (> three months) should show decreasing ablation zone size and increasing involution\(^7,15,24\)

Complications following renal cryoablation are low\(^1,7,10,11,17\)

Cryoablation preserves renal function\(^18\)
- No significant difference between pre and post ablation serum creatinine and hemoglobin\(^19\)
- Collecting system injury is rare, even when the iceball overlaps the renal sinus\(^16,19\)

Multiple tumors can be treated in a single session\(^1,5,15\)

Cryoablation can be conducted under conscious sedation with local anesthesia\(^20,21\)
- Cryoablation is associated with less pain and requires fewer analgesics than radiofrequency ablation\(^22,23\)

Cryoablation offers a short hospital stay, low morbidity and rapid recovery\(^1,24\)

Cryoablation is repeatable\(^11,12\)
There are exceptional benefits when using Galil Medical cryoablation products

- Clinical benefits from a portfolio of proprietary ultrathin 1.5 mm needles include minimal bleeding, easy insertion and positioning, and close placement of multiple needles for optimal tumor coverage.
- Innovative needle technologies produce competitively large ice and offer active thawing without helium.
- Visual-ICE® Cryoablation System, a state-of-the-art system, provides simple, intuitive and responsive operation.

Percutaneous renal cryoablation is an effective treatment for a range of solid, localized kidney tumors, including treatment of high risk patients:

- Multiple co-morbidities
- Solitary kidney
- Multiple tumors
- Renal insufficiency
- Desire for a non-surgical treatment
- Inability to tolerate general anesthesia

**References**


**Indications for Use**

The Galil Medical Cryoablation Systems are intended for cryoablatve destruction of tissue during surgical procedures; various Galil Medical ancillary products are required to perform these procedures. Galil Medical Cryoablation Systems are indicated for use as a cryosurgical tool in the fields of general surgery, dermatology, neurology (including cryoanalgesia), thoracic surgery, ENT, gynecology, oncology, proctology and urology. These Systems are designed to destroy tissue including prostate and kidney tissue, liver metastases, tumors, and skin lesions by the application of extremely cold temperatures.

A full list of specific indications can be found in the Galil Medical Cryoablation System User Manuals.

**Contraindications** There are no known conraindications.