

EXCERPT



Oncology Clinical Technology Compendium

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Executive summary

There's no shortage of clinical technologies available for your service lines, but how do you choose the right ones for your organization?

In our *Oncology Clinical Technology Compendium*, we outline more than 50 emerging technologies, considerations for investment, keys for investment success, and more. The overviews can help you improve clinical effectiveness and differentiate your organization from the competition.

Download this excerpt of the compendium to learn about five of the latest technologies for radiation, medical, and interventional oncology.

Interested in the full technology compendium?
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Oncology technology adoption landscape

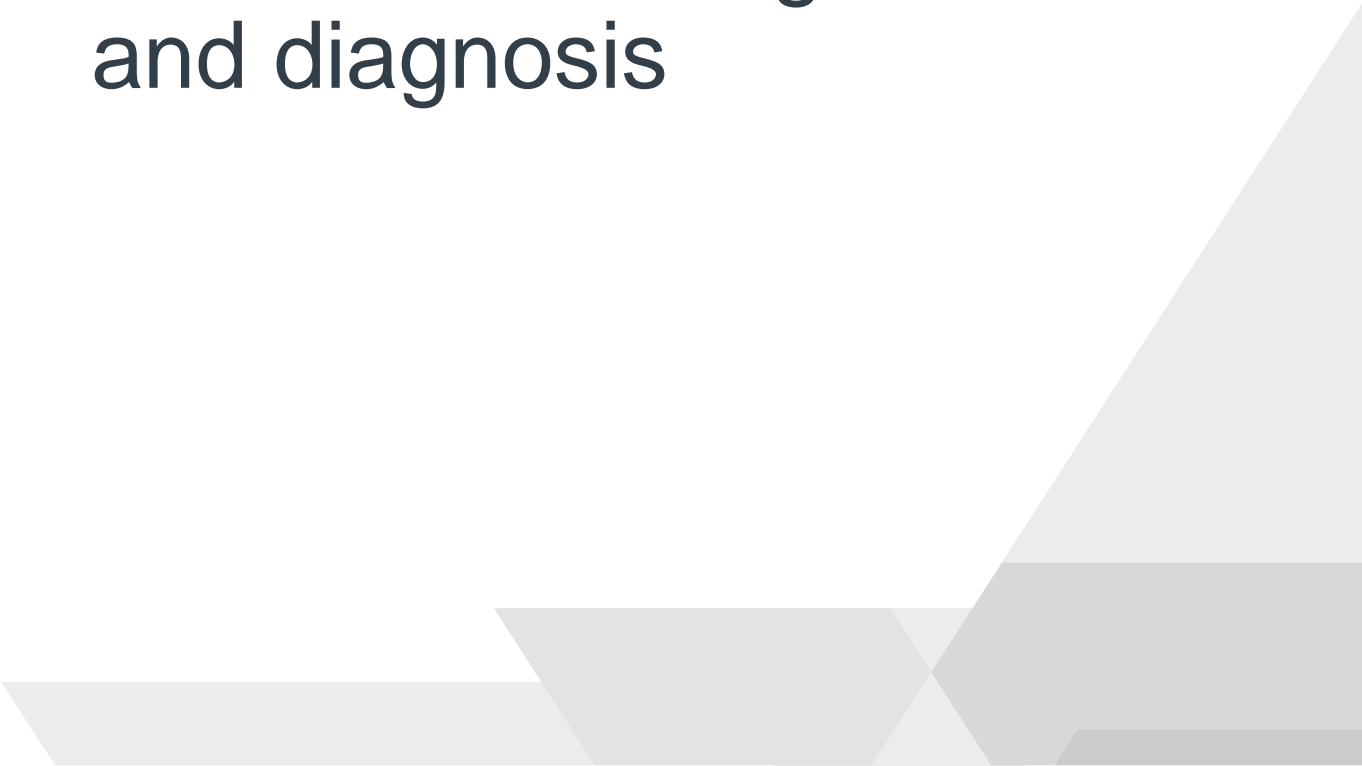
Subspecialty	Conservative	Late majority	Early majority	Early adopter	Progressive
Cancer screening and diagnosis		<ul style="list-style-type: none"> Breast coil Fecal occult blood test Flexible sigmoidoscopy Capsule video endoscopy Optical colonoscopy 	<ul style="list-style-type: none"> Dedicated breast MRI Cologuard stool DNA test Fecal immunochemical test 	<ul style="list-style-type: none"> Automated breast ultrasound CT colonography Endobronchial ultrasound Electromagnetic navigation bronchoscopy Hyperthermic intraperitoneal chemotherapy 	<ul style="list-style-type: none"> Molecular breast imaging
Interventional and surgical oncology	<ul style="list-style-type: none"> Tumor resection 	<ul style="list-style-type: none"> Mohs micrographic surgery Laparoscopic resection Robotic surgery 	<ul style="list-style-type: none"> Embolization Ablation Electronic brachytherapy 	<ul style="list-style-type: none"> Hyperthermia Intraoperative molecular imaging Non-wire tumor localization 	<ul style="list-style-type: none"> MR-guided focused ultrasound Drug eluting beads Irreversible electroporation High-intensity focused ultrasound
Medical oncology	<ul style="list-style-type: none"> Chemotherapy infusion¹ 	<ul style="list-style-type: none"> Genetic testing Oral chemotherapy 	<ul style="list-style-type: none"> Targeted cancer therapies 	<ul style="list-style-type: none"> Immunotherapy Bone marrow transplantation CAR T-cell therapy Next-generation sequencing 	<ul style="list-style-type: none"> Radiomics Liquid biopsy Companion diagnostics Functional and molecular imaging Pharmacogenics CDK4 inhibitors
Radiation oncology	<ul style="list-style-type: none"> CT simulation Low-dose radiation brachytherapy 	<ul style="list-style-type: none"> High-dose radiation brachytherapy Image-guided radiation therapy Three-dimensional conformal radiation therapy Intensity-modulated radiation therapy 	<ul style="list-style-type: none"> Stereotactic radiosurgery Stereotactic body radiation therapy Volumetric-modulated arc therapy Multi-functional LINAC 	<ul style="list-style-type: none"> AccuBoost breast radiotherapy Intra-operative radiation therapy Surface-guided radiation therapy SpaceOAR Hydrogel 	<ul style="list-style-type: none"> MRI-guided radiation therapy Proton beam therapy Single-room proton beam therapy Real-time adaptive radiation therapy Radiosensitivity testing Respiratory gating 4D localization (Calypso)

Source: Service Line Strategy Advisor research and analysis.



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Cancer screening and diagnosis



Molecular breast imaging

Improved specificity, sensitivity give AMCs opportunity to differentiate themselves

What is it?

Molecular breast imaging (MBI) represents a class of novel nuclear medicine imaging modalities designed to provide high-resolution functional imaging of breast tissue. A secondary screening tool for breast cancer, it captures the increased metabolism present in cancerous cells through the use of targeted radiotracers. MBI utilizes technetium-99 to target breast lesions.

Key facts

- **FDA status:** FDA Approved
- **Payer coverage:** Covered by all major private payers and CMS
- **Adoption status:** Progressive; limited to leading breast imaging facilities, centers seeking to differentiate from competition
- **Competing products:** Breast ultrasound, contrast-enhanced spectral mammography, magnetic resonance imaging (MRI), tomosynthesis
- **Clinical considerations:** With improved specificity over breast MRI, MBI helps physicians to better understand lesion malignancy. Provides similar results to breast MRI for pre-surgical planning and to mammography for high risk or dense-breasted screening. MBI also has potential to replace MRI in pre-surgical planning for women with contraindications to MRI.

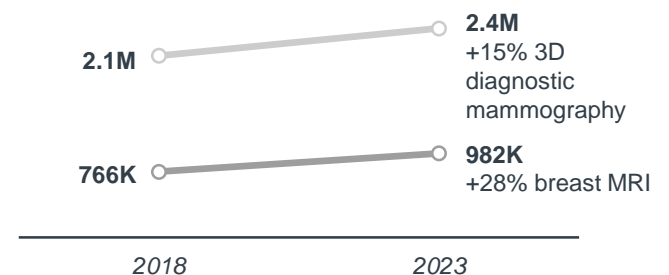
Financial outlook

Medicare HOPPS¹ reimbursement

HCPCS	Description	2019 rate	2020 rate	Percent change
78800, 78801	Tumor imaging, limited, multiple	\$353	\$368	4%

National market estimates

National OP breast imaging volumes



Who should invest?

For AMCs, MBI is a differentiating technology and provides another breast screening option for select patient groups. It is a good option for organizations with a high number of patients interested in alternatives to a breast MRI exam. For community hospitals, MBI is not yet seen as a must-have for majority of breast centers due to limited volume and numerous other competing technologies.

1. Hospital Outpatient Prospective Payment System.

Source: Advisory Board Outpatient Market Estimator; Service Line Strategy Advisor research and analysis.



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Surgical oncology



Non-wire tumor localization

Lower patient pain and lower complications increase viability

What is it?

Tumor localization uses non-radioactive markers and detection probes to identify target tissue for surgical removal. Using a small reflector or magnetic lesion marker detected by radar or a handheld magnetometer, surgeons can precisely target the affected tissue to pinpoint its location. Currently used for lumpectomies in breast cancer patients.

Key facts

- **FDA status:** SAVI SCOUT approved in 2014, Sentimag Magseed approved in 2016
- **Payer coverage:** Covered by Medicare and private payers
- **Adoption status:** Early adopter; over 125 centers currently use SAVI SCOUT
- **Competing products:** MRI, wire localization
- **Clinical considerations:** Tumor localization allows surgeons to better visualize tumors, making it a useful tool to optimize surgical planning, reduce surgical delays and the need for follow-up surgeries, and improve patient satisfaction compared to a more painful wire localization.

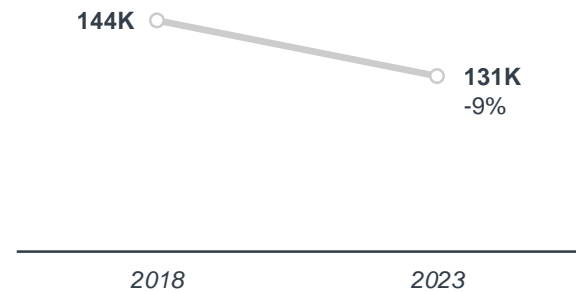
Financial outlook

Medicare HOPPS¹ reimbursement

HCPCS	Description	2019 rate	2020 rate	Percent change
19081	Biopsy, breast, with placement of breast localization device(s) (e.g., clip, metallic pellet), when performed, and imaging of the biopsy specimen, when performed, percutaneous; first lesion, including mammographic guidance	\$1,376	\$1,372	-0%

National market estimates

Outpatient oncology lumpectomy volumes²



Who should invest?

Non-wire tumor localization is a viable investment option for any institution looking to differentiate itself as a breast center of excellence. Although community programs may initially find the cost prohibitive, the immediate significant impact that this technology can have on reducing OR delays presents an opportunity to recoup some of the upfront costs.

1. Hospital Outpatient Prospective Payment System.
 2. Volumes are represented in the outpatient module by unique visits with a primary diagnosis of cancer.



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Interventional oncology



Hyperthermia

Increased payer coverage and effectiveness make a compelling case for AMCs

What is it?

Hyperthermia raises the temperature of a tumor to 108°–113° F for one hour to increase efficacy of radiation therapy (RT) or chemotherapy. It may also be used as a stand alone treatment. Treatment can be delivered locally or regionally. Local hyperthermia applies heat to a small area through microwave, radiofrequency, and ultrasound. Regional hyperthermia applies heat to large tissue areas, such as an organ or limb, using microwave or radiofrequency energy.

Key facts

- **FDA status:** Only a few FDA-approved hyperthermia systems on the market
- **Payer coverage:** Covered by most private payers and Medicare
- **Adoption status:** Early adopter stage; adoption growing as supporting clinical evidence emerges
- **Competing products:** Surgery, radiation therapy, chemotherapy
- **Clinical considerations:** Utilized for palliative management of advanced or recurrent surface and subsurface solid malignant tumors; used as adjuvant to radiation therapy and, less often, chemotherapy; there is clinical evidence of effectiveness in increasing tumor response to RT, making it an additional treatment option for patients with poor prognosis.

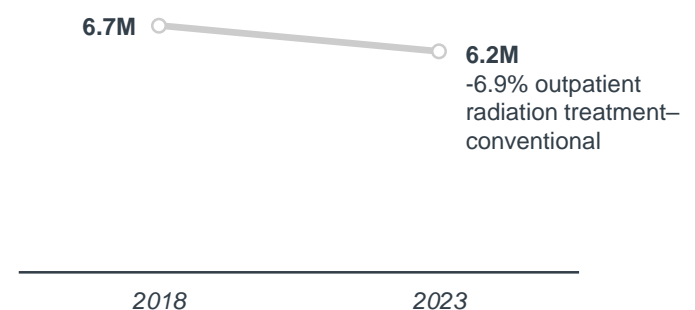
Financial outlook

Medicare HOPPS¹ reimbursement

HCPCS	Description	2019 rate	2020 rate	Percent change
77600	Hyperthermia treatment	\$224	\$236	5%
77605	Hyperthermia treatment	\$705	\$740	5%
77610, 15, 20	Hyperthermia treatment	\$520	\$539	4%

National market estimates

Outpatient oncology radiation treatment volumes²



Who should invest?

Major AMCs and other high-volume cancer centers are best positioned to offer hyperthermia as an adjunctive or standalone treatment option. Although the high cost of the console is potentially prohibitive for most lower-volume community hospitals, increasing reimbursement rates and leasing options may pose solutions for mitigating risk.

1. Hospital Outpatient Prospective Payment System
 2. Volumes represent unique visits in the outpatient module with a primary diagnosis of cancer



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Medical oncology



Immunotherapy

Growth of immunotherapy revenue suggests progressive centers should invest

What is it?

Immunotherapy triggers the immune system to find and destroy cancer. It works by either stimulating the immune system to fight cancer or by boosting the immune system with man-made proteins. Therapeutic antibodies are made in a lab and used to either destroy cancer cells directly or boost the immune response; checkpoint inhibitors, which prevent cancer cells from halting the immune response prematurely; therapeutic vaccines, which treat patients who already have cancer; and adoptive cell therapy, which involves taking a patient’s own T-cells out of their body, growing and activating them in vitro, and reinfusing them back into the patient.

Key facts

- **FDA status:** Sipuleucel-T (Provenge) became the first FDA-approved immunotherapy in 2010; Yervoy was approved in 2011; Opdivo and Keytruda were approved in 2014, Kymriah was approved in 2017
- **Payer coverage:** Both Medicare and private payers cover FDA-approved immunotherapy drugs, but some require prior-authorization
- **Adoption status:** Early adopter; uptake of immunotherapy increasing rapidly
- **Competing products:** Gene therapy, targeted therapies
- **Clinical considerations:** Currently used to treat prostate cancer and melanoma primarily, but research on use for other cancers in progress; although controversial for high costs, immunotherapy in clinical trials have better progression-free survival and overall survival rates than regular therapies. Limited to specific subsets of patients now, but broader potential applications in the future. Patients often experience severe toxicities with immunotherapies that look different from the traditional side effects of chemotherapy.

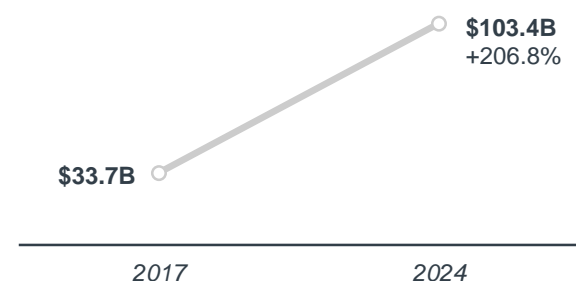
Financial outlook

Medicare HOPPS¹ reimbursement

HCPCS	Description	2019 rate	2020 rate	Percent change
Q2043	Sipuleucel-T (min 50 mil cells; single infusion)	\$43,419	\$46,374	7%
J9228	Ipilimumab injection 10mg (Yervoy)	\$151	\$153	1.5%
J9271	Pembrolizumab injection, 1 mg (Keytruda)	\$49	\$49	0.1%
J9299	Nivolumab injection 1mg (Opdivo)	\$28	\$28	1%

National market estimates

Global cancer immunotherapy revenue



Who should invest?

Immunotherapy is a critical offering for AMCs with comprehensive infusion therapy programs. Associated costs and operational needs make it a less viable investment for the average community cancer center, but progressive community cancer centers should still consider adoption.

1. Hospital Outpatient Prospective Payment System

Source: "Global Cancer Immunotherapies Market to 2024 - Increased Uptake of Immune Checkpoint Inhibitors Driving Growth, Supported by a Large, Robust Pipeline." Research and Markets - Market Research Reports - Welcome, July 2018, www.researchandmarkets.com/research/9rpwcx/global_cancer?w=4; Service Line Strategy Advisor research and analysis.



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Radiation oncology



Surface-guided radiation therapy

Moderate cost and high potential patient throughput makes for a wise investment

What is it?

Surface-guided radiation therapy (SGRT) is a tattoo-free radiation therapy that uses stereo vision technology to position and monitor a patient’s external surface to ensure they are in the correct position during their radiation treatment. SGRT matches surface data during treatment with data captured in the planning or simulation process. Using SGRT, as opposed to marker-based techniques, allows for improved accuracy, patient satisfaction, and throughput.

Key facts

- **FDA status:** Vision RT device approved in 2020
- **Major vendors:** Vision RT, C-RAD
- **Adoption status:** Early adopter
- **Competing products:** Image-guided radiation therapy (IGRT), three-dimensional conformal radiation therapy (3D CRT), intensity-modulated radiation therapy (IMRT)
- **Clinical considerations:** Current use of SGRT for brain, breast, and head & neck cancers. SGRT reduces need for immobilization and makes certain that patients are in the required position for treatment in all six degrees of freedom.

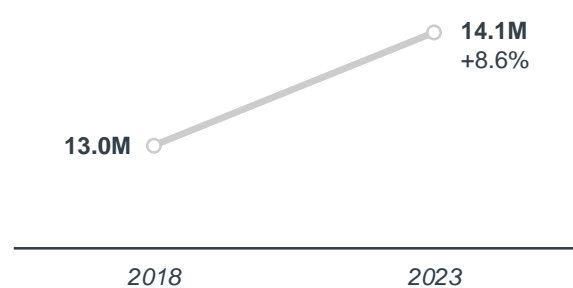
Financial outlook

Medicare HOPPS¹ reimbursement

HCPCS	Description	2019 rate	2020 rate	Percent change
77387	Guidance for localization of target volume for delivery of radiation treatment, includes intrafraction tracking	n/a	n/a	n/a

National market estimates

Outpatient radiation therapy volumes²



Who should invest?

The moderate cost of SGRT equipment, coupled with high potential patient throughput and thus low cost per patient, makes the procedure a manageable investment for mid- to large-size programs. The added benefits of SGRT compared to alternative methods means progressive centers have the opportunity to differentiate themselves, but it is important to ensure patient volumes are high enough and there is physician buy-in before investing.

1. Hospital Outpatient Prospective Payment System.
 2. Volumes represent number of unique treatment visits by patients with a primary diagnosis of cancer.

Source: Guo, B. et al. "Surface Guided Radiation Therapy (SGRT): The Sensitivity of The Region of Interest (ROI) Selection On the Translational and Rotational Accuracy for Whole Breast Irradiation." *International Journal of Radiation Oncology "Biology" Physics*, vol 99, no. 2, 2017; Herron, E. et al. "Surface Guided Radiation Therapy as a Replacement for Patient Marks in Treatment of Breast Cancer." *International Journal of Radiation Oncology "Biology" Physics*, vol 102, no. 3, 2018; Kügele, Malin et al. "Surface Guided Radiotherapy (SGRT) Improves Breast Cancer Patient Setup Accuracy." *Journal of Applied Clinical Medical Physics*, vol 20, no. 9, 2019; Advisory Board Oncology Market Estimator; Service Line Strategy Advisor research and analysis.

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