

SUPPLEMENTAL TABLE 3
SURGICAL AND RADIOTHERAPY TREATMENTS FOR CANCER

Type of Surgical Procedure*	Description	Applicable Cancer	Type of Surgical Procedure*	Description	Applicable Cancer
Mastectomy	Surgery to remove the entire breast	Breast cancer	Three-dimensional conformal radiotherapy (3DCRT)	A type of radiation delivery that shapes the radiation beams to match the shape of the tumor	Multiple cancers
Lumpectomy (or partial mastectomy)	Surgery to remove the cancer and some normal tissue around it, but not the breast itself	Breast cancer	Intensity modulated radiotherapy (IMRT)	An advanced formed of 3DCRT that uses advanced computer programs to calculate and deliver precise radiation doses to a malignant tumor or specific areas within the tumor	Multiple cancers
Orchiectomy	Surgery to remove one or both testicles	Testicular cancer	Image-guided radiotherapy (IGRT)	The use of imaging during radiation therapy to improve the precision and accuracy of treatment delivery	Many cancers, especially those that may move during treatment or are located adjacent to critical organs
Video-Assisted Thoroscopic Surgery (VATS)	Surgery performed using a small video camera that is introduced into the patient's chest via small incisions	Multiple head, neck, and chest cancers	Stereotactic radiosurgery (SRS)	A type of external radiation therapy that uses special equipment to position the patient and advanced computer programs to calculate and deliver precisely a single large dose of radiation to a tumor	Brain metastases
Laparoscopic surgery	Surgery done with the aid of a laparoscope	Variety of abdominal cancers	Stereotactic body radiotherapy (SBRT) or Stereotactic ablative radiotherapy (SABR)	Administers very high doses of radiation in a few fractions (usually 5 or less), using several beams of various intensities aimed at different angles to precisely target the tumor anywhere in the body	Liver cancer, lung cancer, pancreatic cancer, spinal metastases, oligometastases, recurrent cancers requiring re-irradiation
Reconstructive surgery	Surgery to restore the function or appearance of organs or tissues that were either removed or changed by cancer treatment	Breast and head and neck cancer	Proton therapy	A type of radiation treatment that uses protons to treat cancer	Pediatric cancers, certain unresectable skull base or head and neck cancers, certain CNS tumors, ocular tumors, recurrent cancers requiring re-irradiation, hepatocellular carcinoma, certain retroperitoneal sarcoma **
Limb-sparing surgeries	Surgery to remove a tumor in a limb (arm or leg) without removing the whole limb	Sarcoma and other cancers	Particle therapy	A form of external beam radiotherapy using beams of energetic protons, neutrons, or positive ions such as carbon ion for cancer treatment	Carbon ion therapy is being tested for several solid cancers outside of the US
Partial nephrectomy	Surgery to remove part of one kidney or a kidney tumor, but not an entire kidney	Kidney cancer	Neoadjuvant or adjuvant radiotherapy	Radiation is delivered either before (neoadjuvant) or after (adjuvant) surgery, sometimes with concurrent systemic therapy	Multiple cancers
The Whipple/modified Whipple procedure	Surgery to remove head of the pancreas, the duodenum, a portion of the stomach, and other nearby tissues	Pancreatic cancer	Organ preservation approach	Definite radiotherapy +/- chemotherapy that are designed to produce cure while preserving the organ where the tumor is located	Certain head and neck cancers, breast cancer (with lumpectomy), anal cancer, esophageal cancer, bladder cancer
Total mesorectal excision	Surgery to remove significant length of the bowel around a tumor	Rectal cancer			
Nerve-sparing prostatectomy	Surgery to remove part or all of the prostate and some of the tissue around it	Prostate cancer			
Transanal Endoscopic Microsurgery (TEM)	Surgery performed through the rectum with specially designed microsurgical instruments to remove rectal tumors and early stage rectal cancers	Rectal cancer			
Modified retroperitoneal lymph node dissection	Surgery to remove abdominal lymph nodes	Testicular cancer			
Sentinel lymph node biopsies	Surgery to identify, remove, and examine sentinel lymph node to determine whether cancer cells are present	Breast, melanoma, and colorectal cancers			
Robotic or computer-assisted surgeries	Surgeries that use robotic systems to aid in procedures	Multiple cancers			
Brachytherapy	A form of radiotherapy where a sealed radiation source is placed inside or next to the area requiring treatment	Cervical cancer, prostate cancer, ocular melanoma, breast cancer, skin cancer, recurrent cancers, other cancers			
*Delivered alone or in combination with other types of radiation listed in the table with or without concurrent chemotherapy, targeted therapy or hormonal therapy					
**ASTRO group 1 guideline					