





TABLE 1

# NEWLY FDA-APPROVED MEDICAL PRODUCTS FOR THE PREVENTION, TREATMENT, AND IMAGING OF CANCER: AUG. 1, 2014–JULY 31, 2015





## ANGIOGENESIS INHIBITORS

Approved Indication	Generic Name	Trade Name	Formulation
certain forms of cervical, ovarian, fallopian tube, and peritoneal cancers*	bevacizumab	Avastin	
certain type of thyroid cancer	lenvatinib	Lenvima	
certain forms of colorectal and lung cancers*	ramucirumab	Cyramza	

## BONE REMODELING INHIBITORS

Approved Indication	Generic Name	Trade Name	Formulation
potentially lethal complication of advanced cancers*	denosumab	Xgeva	


## CELL SIGNALING INHIBITORS

Approved Indication	Generic Name	Trade Name	Formulation
certain type of lung cancer*	gefitinib**	Iressa	
certain type of non-Hodgkin lymphoma*	ibrutinib†	Imbruvica	
certain type of breast cancer	palbociclib*^	Ibrance	
most common type of skin cancer	sonidegib	Odomzo	





## DNA REPAIR INHIBITOR

Approved Indication	Generic Name	Trade Name	Formulation
certain type of ovarian cancer	olaparib***	Lynparza	

## EPIGENOME-MODIFYING AGENTS

Approved Indication	Generic Name	Trade Name	Formulation
multiple myeloma	panobinostat	Farydak	

## IMMUNOTHERAPEUTICS

Approved Indication	Generic Name	Trade Name	Formulation
certain type of leukemia	blinatumomab†^	Blincyto	
neuroblastoma	dinutuximab	Unituxin	
melanoma, certain type of lung cancer	nivolumab†	Opdivo	
melanoma	pembrolizumab†	Keytruda	


## IMAGING AGENTS

Approved Indication	Generic Name	Trade Name	Formulation
lymphatic mapping in solid tumors*	technetium 99m tilmanocept	Lymphoseek	

## CANCER SCREENING TESTS

Approved Indication	Generic Name	Trade Name	Formulation
colorectal cancer	none	Cologuard	

## PREVENTIVE VACCINES

Approved Indication	Generic Name	Trade Name	Formulation
cervical, vulvar, vaginal, and anal cancers	human papillomavirus 9-valent vaccine (types 6, 11, 16, 18, 31, 33, 45, 52, and 58)	Gardasil 9	

\* new indication for 2014–2015

\*\* approved with a companion diagnostic

† breakthrough therapy

^ first in class

Where drugs have multiple trade names are used, only the most common have been listed

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TABLE 2

## ESTIMATED INCIDENCE AND MORTALITY FOR SELECT CANCERS

	ESTIMATED 2015 INCIDENCE			ESTIMATED 2015 DEATHS		
	Total	Male	Female	Total	Male	Female
ALL SITES	1,658,370	848,200	810,170	589,430	312,150	277,280
HEAD AND NECK REGION						
Brain & other nervous system	22,850	12,900	9,950	15,320	8,940	6,380
Oral cavity & pharynx	45,780	32,670	13,110	8,650	6,010	2,640
Tongue	14,320	10,310	4,010	2,190	1,500	690
Mouth	12,920	7,750	5,170	2,120	1,200	920
Pharynx	15,520	12,380	3,140	2,660	2,010	650
Larynx	13,560	10,720	2,840	3,640	2,890	750
Lung & bronchus	221,200	115,610	105,590	158,040	86,380	71,660
Breast	234,190	2,350	231,840	40,730	440	40,290
GASTROINTESTINAL SYSTEM						
Esophagus	16,980	13,570	3,410	15,590	12,600	2,990
Stomach	24,590	15,540	9,050	10,720	6,500	4,220
Liver & intrahepatic bile duct	35,660	25,510	10,150	24,550	17,030	7,520
Gallbladder & other biliary	10,910	4,990	5,920	3,700	1,660	2,040
Pancreas	48,960	24,840	24,120	40,560	20,710	19,850
Small intestine	9,410	4,960	4,450	1,260	670	590
Colon and rectum <sup>1</sup>	93,090	45,890	47,200	49,700	26,100	23,600
UROGENITAL SYSTEM						
Kidney & renal pelvis	61,560	38,270	23,290	14,080	9,070	5,010
Ovary	21,290		21,290	14,180		14,180
Uterine corpus	54,870		54,870	10,170		10,170
Uterine cervix	12,900		12,900	4,100		4,100
Urinary bladder	74,000	56,320	17,680	16,000	11,510	4,490
Prostate	220,800	220,800		27,540	27,540	
Testis	8,430	8,430		380	380	
SKIN						
Skin (excluding basal & squamous)	80,100	46,610	33,490	13,340	9,120	4,220
Melanoma	73,870	42,670	31,200	9,940	6,640	3,300
HEMATOLOGICAL SYSTEM						
Leukemia	54,270	30,900	23,370	24,450	14,210	10,240
Acute lymphocytic leukemia	6,250	3,100	3,150	1,450	800	650
Chronic lymphocytic leukemia	14,620	8,140	6,480	4,650	2,830	1,820
Acute myeloid leukemia	20,830	12,730	8,100	10,460	6,110	4,350
Chronic myeloid leukemia	6,660	3,530	3,130	1,140	590	550
Lymphoma	80,900	44,950	35,950	20,940	12,140	8,800
Hodgkin lymphoma	9,050	5,100	3,950	1,150	660	490
Non-Hodgkin lymphoma	71,850	39,850	32,000	19,790	11,480	8,310
Myeloma	26,850	14,090	12,760	11,240	6,240	5,000
OTHER CANCERS						
Bones & joints	2,970	1,640	1,330	1,490	850	640
Soft tissue (including heart)	11,930	6,610	5,320	4,870	2,600	2,270

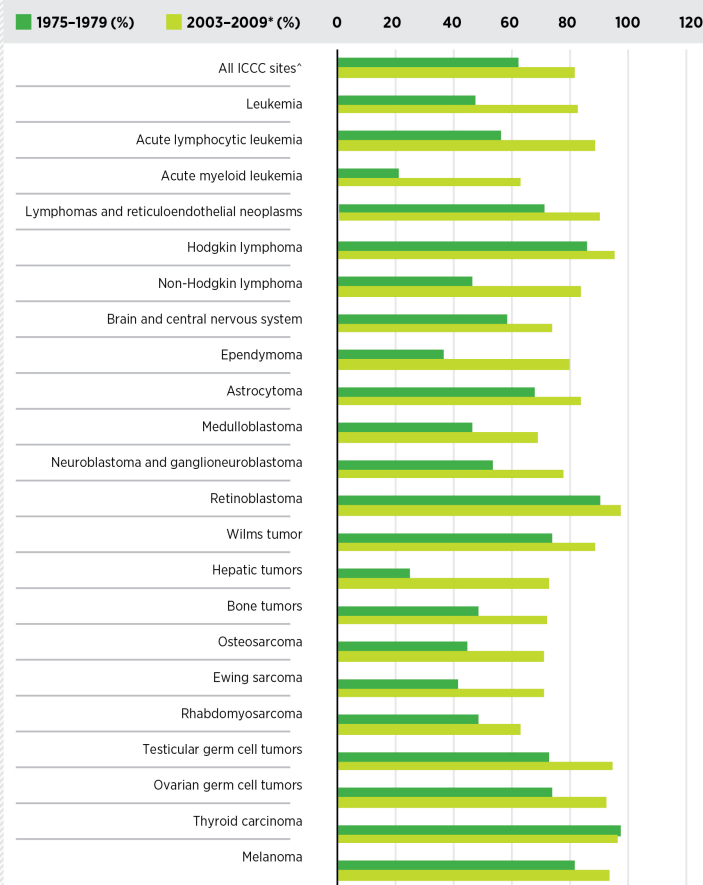
<sup>1</sup>Rounded to the nearest 10; estimated new cases exclude basal cell and squamous cell skin cancers and in situ carcinomas except urinary bladder. About 60,290 carcinoma in situ of the female breast and 63,440 melanoma in situ will be newly diagnosed in 2015. <sup>2</sup>Estimated deaths for colon and rectal cancers are combined. <sup>3</sup>More deaths than cases may reflect lack of specificity in recording underlying cause of death on death certificates and/or an undercount in the case estimate.

Source: Estimated new cases are based on cancer incidence rates from 49 states and the District of Columbia during 1995-2011 as reported by the North American Association of Central Cancer Registries (NAACCR), representing about 98% of the US population. Estimated deaths are based on U.S. mortality data during 1997-2011, National Center for Health Statistics, Centers for Disease Control and Prevention.

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TABLE 3

## COMPARISON OF FIVE-YEAR RELATIVE SURVIVAL RATES FOR PEDIATRIC CANCERS (0-19 YRS) BETWEEN 1975-79 AND 2003-09



\*Followed through 2010

\*Cancers in children and younger adolescents are classified by histology (tissue type) into 12 major groups using the International Classification of Childhood Cancers (ICCC). Adapted from (1)

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## CANCER-CAUSING PATHOGENS

### BACTERIA

Pathogen	Cancer	% of global cancer cases attributable to infection*
<i>Helicobacter pylori</i>	Stomach cancers	32.5

### PARASITES

Pathogen	Cancer	% of global cancer cases attributable to infection*
<i>Clonorchis sinensis</i>	Biliary cancer, pancreatic cancer, and gallbladder cancer	0.1
<i>Opisthorchis viverrini</i>	Biliary cancer, pancreatic cancer, and gallbladder cancer	unknown
<i>Schistosoma haematobium</i>	Bladder cancer	0.3

### VIRUSES

Pathogen	Cancer	% of global cancer cases attributable to infection*
Epstein-Barr Virus (EBV)	Stomach cancers, Hodgkin and certain non-Hodgkin lymphomas, and nasopharyngeal cancers	5.4
Hepatitis B/C Virus (HBV and HCV)	Hepatocellular carcinoma	29.5
Human Herpes Virus type -8 (HHV-8; also known as Kaposi sarcoma herpes virus)	Kaposi sarcoma and certain forms of lymphoma	2.1
Human Immunodeficiency Virus (HIV)	Kaposi sarcoma and non-Hodgkin lymphoma	unknown
Human Papillomavirus (HPV)	Cervical, anogenital, head and neck, and oral cancers	30
Human T-cell Lymphotropic Virus, type 1 (HTLV-1)	T-cell leukemia and lymphoma	0.1
Merkel Cell Polyomavirus (MCV)	Skin cancer	unknown

\* where known  
Data from (78)

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TABLE 5

## INHERITED CANCER RISK

CANCER	SYNDROME	ASSOCIATED GENE
Leukemias and lymphomas	Ataxia telangiectasia	ATM
All cancers	Bloom syndrome	BLM
Breast, ovarian, pancreatic, and prostate cancers	Breast-ovarian cancer syndrome	BRCA1, BRCA2
Breast, thyroid, and endometrial cancers	Cowden syndrome	PTEN
Colorectal cancer	Familial adenomatous polyposis (FAP)	APC
Melanoma	Familial atypical multiple mole-melanoma syndrome (FAMM)	CDKN2A
Retinal cancer	Familial retinoblastoma	RB1
Leukemia	Fanconi's anemia	FACC, FACA
Colorectal cancer	Hereditary nonpolyposis colorectal cancer/Lynch syndrome	MLH1, MSH2, MSH6, PMS2
Pancreatic cancer	Hereditary pancreatitis/familial pancreatitis	PRSS1, SPINK1
Leukemias, breast, brain, and soft tissue cancers	Li-Fraumeni	TP53
Pancreatic cancers, pituitary adenomas, benign skin and fat tumors	Multiple endocrine neoplasia 1	MEN1
Thyroid cancer, pheochromocytoma	Multiple endocrine neoplasia 2	RET, NTRK1
Pancreatic, liver, lung, breast, ovarian, uterine, and testicular cancers	Peutz-Jeghers syndrome	STK11/LKB1
Tumors of the spinal cord, cerebellum, retina, adrenals, kidneys	von Hippel-Lindau syndrome	VHL
Kidney cancer	Wilms tumor	WT1
Skin cancer	Xeroderma pigmentosum	XPD, XPB, XPA

This list is not meant to be exhaustive, but contains some of the more commonly occurring cancer syndromes  
 Source: <http://dceg.cancer.gov/research/what-we-study/genes-host/hereditary-cancer-syndromes>

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TABLE 6

## SURGERIES FOR THE PREVENTION OF CANCER

GENETIC MUTATION	CANCER	TECHNIQUE	REMOVES
APC	Colon cancer	Colectomy	Colon/large intestine
BRCA1 or BRCA2	Breast cancer	Mastectomy	Breasts
BRCA1 or BRCA2	Ovarian cancer	Salpingo-oophorectomy	Ovaries and fallopian tubes
CHD1	Stomach cancer	Gastrectomy	Stomach
RET	Medullary thyroid cancer	Thyroidectomy	Thyroid

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## FDA-APPROVED THERAPEUTICS FOR THE TREATMENT OF CANCER

## DNA-SYNTHESIS INHIBITORS (ANTIMETABOLITES)

Approved Indication	Generic Name	Trade Name
multiple cancers	5-fluorouracil (5FU)	Adrucil
certain leukemias	6-mercaptopurine	Purinethol
breast and colorectal cancers	capecitabine	Xeloda
certain leukemias, lymphoma	cladribine	Litrak, Movectro
certain leukemias	clofarabine	Clolar
certain leukemias, lymphoma	cytarabine	DepoCyt, Cytosar-U
stomach cancer	flouxuridine	FUDR
certain leukemias, lymphoma	fludarabine	Fludara
breast, lung, ovarian, and pancreatic cancers	gemcitabine	Gemzar
certain leukemias	hydroxyurea	Droxia
multiple cancers	methotrexate	Rheumatrex, Trexall
multiple cancers	mitomycin	Mutamycin
certain leukemias, lymphoma	nelarabine	Arranon
lung and ovarian cancers, mesothelioma	pemetrexed	Alimta
certain leukemias	pentostatin	Nipent
certain lymphomas	pralatrexate	Foloty

## DNA-DAMAGING AGENTS

Approved Indication	Generic Name	Trade Name
ovarian cancer	altretamine	Hexalen
certain leukemias	arsenic trioxide	Trisenox
multiple cancers	bendamustine	Treanda
certain lymphomas, squamous cell and testicular cancers	bleomycin sulfate	Blenoxane
certain leukemias	busulfan	Myleran, Busulfex
breast, lung and ovarian cancers	carboplatin	Paraplatin, Paraplat
brain tumors, certain lymphomas	carmustine	BiCNU
multiple cancers	chlorambucil	Leukeran
multiple cancers	cisplatin	Platinol-AQ
multiple cancers	cyclophosphamide	Cytoxan
melanoma, certain brain cancers	dacarbazine	DTIC-Dome
multiple cancers	dactinomycin	Cosmegen
certain leukemias daunorubicin;	daunorubicin	Cerubidine
multiple cancers	doxorubicin hydrochloride	Adriamycin PFS, Epirubicin
certain leukemias, breast and stomach cancers	epirubicin hydrochloride	Ellence

testicular and lung cancers	etoposide phosphate	Etopophos; Toposar, VePesid
certain leukemias	idarubicin	Idamycin PFS
multiple cancers	ifosfamide	Ifex
colon, lung and rectal cancers	irinotecan	Camptosar, Camptostar
brain tumors	lomustine	CeeNU
multiple cancers	methochlorothalamine hydrochloride	Mustargen
multiple cancers	melfalan	Alkeran
certain lymphomas	methoxsalen	Uvadex
multiple cancers	mitoxantrone	Novantrone
colon cancer	oxaliplatin	Eloxatin
testicular cancer	plicamycin	Mithracin
certain lymphomas	procarbazine	Matulane
pancreatic cancer	streptozocin	Zanosar
melanoma, certain brain cancers	temozolomide	Temodar
certain leukemias	thioguanine	Thioguanine Tabloid
multiple cancers	thiotepa	Thiopex
ovarian and small cell lung cancers	topotecan	Hycamtin
bladder cancer	valrubicin	Valstar

## CELL CYTOSKELETON-MODIFYING AGENTS

Approved Indication	Generic Name	Trade Name
prostate cancer	cabazitaxel	Jevtana
multiple cancers	docetaxel	Taxotere
breast cancer	eribulin mesylate	Halaven
breast cancer	ixabepilone	Ixempra
multiple cancers	paclitaxel albumin-bound particles	Abiraxane
multiple cancers	vinblastine	Velban
multiple cancers and lymphomas	vincristine	Oncovin
certain leukemias and lymphomas	vincristine sulfate liposomes	Marqibo
breast and lung cancers	vinorelbine tartrate	Navelbine

## ANTINUTRIENTS

Approved Indication	Generic Name	Trade Name
certain leukemias	asparaginase	Elspar, Kidrolase

## GENE-TRANSCRIPTION MODIFIERS

Approved Indication	Generic Name	Trade Name
certain lymphomas	bexarotene	Targretin
certain leukemias	tretinoin (all-trans retinoic acid)	Vesanoid

## RADIATION-EMITTING DRUGS

Approved Indication	Generic Name	Trade Name
prostate cancer bone metastases	radium Ra 223 dichloride	Xofigo

## HORMONES/ANTIHORMONES

Approved Indication	Generic Name	Trade Name
prostate cancer	abarelix	Plenaxis
prostate cancer	abiraterone acetate	Zytiga
breast cancer	anastrozole	Arimidex
prostate cancer	bicalutamide	Casodex
prostate cancer	degarelix	Firmagon
prostate cancer	enzalutamide	Xtandi
prostate cancer	estramustine	Emcyf, Estracyt
breast cancer	exemestane	Aromasin
prostate cancer	flutamide	Eulexin
metastatic breast cancer	fulvestrant	Faslodex
prostate and breast cancers	goserelin acetate implant	Zoladex
breast cancer	letrozole	Femara
prostate cancer	leuprolide acetate	Eligard, Lupron, Viadur

breast and endometrial cancers	megestrol acetate	Megace, Megace Oral Suspension
breast cancer	tamoxifen	Nolvadex
prostate cancer	triptorelin pamoate	Trelstar Depot

## IMMUNE-SYSTEM MODIFIERS

Approved Indication	Generic Name	Trade Name
multiple cancers	interferon alfa-2b	Intron A
melanoma, kidney cancer	aldesleukin	Proleukin
myelodysplastic syndrome, certain lymphomas	lenalidomide	Revlimid
multiple myeloma	pomalidomide	Pomalyst

## PROTEASOME INHIBITORS

Approved Indication	Generic Name	Trade Name
multiple myeloma	bortezomib	Velcade
multiple myeloma	carfilzomib	Kyprolis

## PROTEIN-TRANSLATION INHIBITORS

Approved Indication	Generic Name	Trade Name
certain type of leukemia	Omacetaxine mepesuccinate	Synribo

## EPIGENOME-MODIFYING AGENTS

Approved Indication	Generic Name	Trade Name
myelodysplastic syndrome	azacitidine	Vidaza
certain lymphomas	belinostat	Beleodaq
myelodysplastic syndrome	decitabine	Dacogen
multiple myeloma	panobinostat	Farydak
certain lymphomas	romidepsin	Istodax
certain lymphomas	vorinostat	Zolinza

## DNA-REPAIR INHIBITORS

Approved Indication	Generic Name	Trade Name
certain form of ovarian cancer*	olaparib	Lynparza

## IMMUNE-CHECKPOINT INHIBITORS

Approved Indication	Generic Name	Trade Name
melanoma	ipilimumab	Yervoy
melanoma, certain form of lung cancer	nivolumab	Opdivo
melanoma	pembrolizumab	Keytruda

## BONE-REMODELING INHIBITORS

Approved Indication	Generic Name	Trade Name
potentially lethal complication of advanced cancers*	denosumab	Xgeva

## ANGIOGENESIS INHIBITORS

Approved Indication	Generic Name	Trade Name
kidney cancer	axitinib	Inlyta
colon, kidney, lung, certain forms of cervical, ovarian, fallopian tube, and peritoneal cancers	bevacizumab	Avastin

thyroid cancer	cabozantinib	Cometriq
certain type of thyroid cancer	lenvatinib	Lenvima
kidney cancer, soft tissue sarcomas, gastrointestinal stromal tumors	pazopanib	Votrient
certain types of lung and stomach cancers	ramucirumab	Cyramza

colorectal cancer, gastrointestinal stromal tumors	regorafenib	Stivarga
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kidney cancer, certain type of thyroid cancer	sorafenib	Nexavar
gastrointestinal stromal tumors, kidney cancer, some pancreatic cancers	sunitinib	Sutent
thyroid cancer	vandetanib	Caprelsa
colorectal cancer	ziv-aflibercept	Zaltrap

## CELL-LYSIS MEDIATORS

Approved Indication	Generic Name	Trade Name
certain leukemias	alemtuzumab	Campath
certain types of leukemia	blinatumomab	Blinicyto
certain lymphomas	brentuximab vedotin	Adcetris
neuroblastoma	dinutuximab	Unituxin
certain lymphomas	ibrutinomab	Zevalin
certain form of leukemia	obinituzumab	Gazyva
certain leukemias	ofatumumab	Arzerra
certain lymphomas	rituximab	Rituxan

## THERAPEUTIC VACCINES

Approved Indication	Generic Name	Trade Name
prostate cancer	ado-trastuzumab sipuleucel-T	Kadcyla, Provenge

## CELL-SIGNALING INHIBITORS

Approved Indication	Generic Name	Trade Name
HER-2+ breast cancer	ado-trastuzumab emtansine	Kadcyla
certain type of lung cancer	afatinib	Gilotrif
certain type of leukemia	bosutinib	Bosulif
certain type of metastatic ALK-positive lung cancer	ceritinib	Zykadia

colon cancer*, head and neck cancer	cetuximab	Erbix
specific lung cancers*	crizotinib	Xalkori
some leukemias	dasatinib	Sprycel
certain type of melanoma*	dabrafenib	Tafinlar

some lung cancers*, pancreatic cancer	erlotinib	Tarceva
some pancreatic cancers, kidney cancer; non-carcinoid kidney tumors, HER-2+ breast cancers	everolimus	Afinitor

lung cancer	gefitinib	Iressa
certain form of lymphoma and non-Hodgkin lymphoma	ibrutinib	Imbruvica
certain types of leukemia and lymphoma	idelalisib	Zydelig

some leukemias, stomach cancer, certain type of skin cancer	imatinib	Gleevec, Glivec
HER-2+ breast cancers	lapatinib	Tykerb
some leukemias	nilotinib	Tasigna
certain subtype of breast cancer	palbociclib	Ibrance

colon cancer	panitumumab	Vectibix
HER-2+ breast cancer	pertuzumab	Perjeta
certain types of leukemia	ponatinib	Iclusig
myelofibrosis	ruixotinib	Jakafi
most common type of skin cancer	sonidegib	Odomzo

certain types of melanoma*	trametinib	Mekinist
HER-2+ breast cancer	trastuzumab	Herceptin
kidney cancer	temsirolimus	Torisel, Torisel
thyroid cancer	vandetanib	Caprelsa
melanoma*	vemurafenib	Zelboraf
most common type of skin cancer	vismodegib	Erivedge

includes companion diagnostic		
Some drugs are available in multiple formulations, these have been listed only once.		
Where multiple trade names are used, only the most common have been listed		

# SUPPLEMENTAL TABLE 2

## FDA-APPROVED THERAPEUTICS FOR CANCER RISK REDUCTION OR TREATMENT OF PRECANCEROUS CONDITIONS\*

### CANCER RISK REDUCTION

Condition	Generic Name	Trade Name
Breast cancer	raloxifene tamoxifen	Evista Nolvadex
Cervical, vulvar, vaginal, and anal cancers and dysplasia, genital warts	Human Papillomavirus Quadrivalent Vaccine (Types 6, 11, 16, and 18)	Gardasil
Cervical, vulvar, vaginal, and anal cancers and dysplasia, genital warts	Human Papillomavirus 9-valent Vaccine (Types 6, 11, 16, 18, 31, 33, 45, 52, and 58)	Gardasil 9
Cervical cancer and cervical dysplasia	Human Papillomavirus Bivalent Vaccine (Types 16 and 18)	Cervarix

### TREATMENT OF PRECANCEROUS CONDITIONS

Condition	Generic Name	Trade Name
Actinic keratosis	Ingenol mebutate fluorouracil diclofenac sodium 5-aminolevulinic acid + photodynamic therapy (PDT) Masoprocol/nordihydroguaiaretic acid	Picato Adricil Voltaren Actinex
Bladder dysplasia	bacillus calmet guerin/BCG Valrubicin	Valstar
Esophageal dysplasia	porfimer sodium + photodynamic therapy (PDT)	Photofrin

\*Adapted from Wu X, Patterson S, Hawk E. Chemoprevention - History and general principles. Best Practice Research Clinical Gastroenterology. 2011;25:445-59.

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## SUPPLEMENTAL TABLE 3

## SURGICAL AND RADIOTHERAPY TREATMENTS FOR CANCER

## SURGICAL TREATMENTS

Used to Treat	Procedure
breast cancer	Mastectomy
breast cancer	Lumpectomy
testicular cancer	Orchiectomy
multiple head, neck, and chest cancers	Video-assisted thoracoscopic surgery (VATS)
variety of abdominal cancers	Laparoscopic surgery
sarcoma and other cancers	Reconstructive and limb-sparing surgeries
kidney cancer	Partial nephrectomy
pancreatic cancer	The Whipple/modified Whipple procedure
stomach-sparing pancreatic surgery for pancreatic cancer	Pancreatoduodenectomy
rectal cancer	Total mesorectal excision
prostate cancer	Nerve-sparing prostatectomy
rectal cancer	Transanal endoscopic microsurgery (TEM)
testicular cancer	Modified retroperitoneal lymph node dissection
breast, melanoma, and colorectal cancer	Sentinel lymph node biopsies
breast cancer, laryngeal cancer, and anal/rectal cancer	Neoadjuvant chemotherapy
multiple cancers	Robotic or computer-assisted surgeries

## RADIOTHERAPY TREATMENTS

Used to Treat	Procedure
prostate, cervical, and other cancers	Brachytherapy
multiple cancers	Image-guided radiation therapy (IGRT)
multiple cancers	Intensity modulated radiation therapy (IMRT)
brain metastases	Stereotactic radiosurgery
liver and lung cancers	Stereotactic body radiation therapy
multiple cancers	Neoadjuvant and adjuvant radiotherapy combined with radiation therapy
head and neck cancers	Radiation therapy combined with molecularly targeted therapy (cetuximab)
prostate cancer	Radiation therapy combined with androgen deprivation
prostate cancer	Adjuvant radiotherapy
pediatric cancers	Proton therapy
unresectable glioblastoma, lung cancer, head and neck cancer, esophagus cancer, pancreas cancer	Concurrent chemotherapy and radiation therapy
anal cancer, head and neck cancer	Radiation with chemotherapy can produce cure with organ preservation
breast cancer	Radiation and surgery (with or without chemotherapy) can produce cure with organ preservation

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