

**Supplemental Table 1.** International Classification of Diseases, 9<sup>th</sup> revision, Clinical Modification principle diagnosis code for malignant gastrointestinal cancers

Description	ICD-9-CM
Diagnosis ICD-9-CM Codes	
<b>Esophageal malignant neoplasm</b>	
Malignant neoplasm of cervical esophagus	150.0
Malignant neoplasm of thoracic esophagus	150.1
Malignant neoplasm of abdominal esophagus	150.2
Malignant neoplasm of upper third of esophagus	150.3
Malignant neoplasm of middle third of esophagus	150.4
Malignant neoplasm of lower third of esophagus	150.5
Malignant neoplasm of other specified parts of esophagus	150.8
Malignant neoplasm of esophagus unspecified site	150.9
<b>Gastric malignant neoplasm</b>	
Malignant neoplasm of cardia	151.0
Malignant neoplasm of pylorus	151.1
Malignant neoplasm of pyloric antrum	151.2
Malignant neoplasm of fundus of stomach	151.3
Malignant neoplasm of body of stomach	151.4
Malignant neoplasm of lesser curvature of stomach unspecified	151.5
Malignant neoplasm of greater curvature of stomach unspecified	151.6
Malignant neoplasm of other specified sites of stomach	151.8
Malignant neoplasm of stomach unspecified site	151.9
<b>Colonic malignant neoplasm</b>	
Malignant neoplasm of hepatic flexure	153.0
Malignant neoplasm of transverse colon	153.1
Malignant neoplasm of descending colon	153.2
Malignant neoplasm of sigmoid colon	153.3
Malignant neoplasm of cecum	153.4
Malignant neoplasm of ascending colon	153.6
Malignant neoplasm of splenic flexure	153.7
Malignant neoplasm of other specified sites of large intestine	153.8
Malignant neoplasm of colon unspecified site	153.9
<b>Hepatic malignant neoplasm</b>	
Malignant neoplasm of liver primary	155.0
Malignant neoplasm of intrahepatic bile ducts	155.1
Malignant neoplasm of liver not specified as primary or secondary	155.2
<b>Pancreatic malignant neoplasm</b>	
Malignant neoplasm of head of pancreas	157.0
Malignant neoplasm of body of pancreas	157.1
Malignant neoplasm of pancreatic duct	157.3
Malignant neoplasm of islets of Langerhans	157.4
Malignant neoplasm of other specified sites of pancreas	157.8
Malignant neoplasm of pancreas part unspecified	157.9
<b>Rectal malignant neoplasm</b>	
Malignant neoplasm of rectosigmoid junction	154.0
Malignant neoplasm of rectum	154.1
Malignant neoplasm of other sites of rectum rectosigmoid junction	154.8

**Supplemental Table 2.** International Classification of Diseases, 9<sup>th</sup> revision, Clinical Modification principle procedure codes for major cancer-related resections performed in an inpatient hospital facility

Description	ICD-9-CM
Procedure ICD-9-CM Codes	
<b>Esophageal resection</b>	
Esophagectomy, not otherwise specified	42.40
Partial esophagectomy	42.41
Total esophagectomy	42.42
Intrathoracic esophagoesophagostomy	42.51
<b>Gastric resection</b>	
Partial gastrectomy with anastomosis to esophagus	43.5
Partial gastrectomy with anastomosis to duodenum	43.6
Partial gastrectomy with anastomosis to jejunum	43.7
Partial gastrectomy with jejunal transposition	43.81
Other partial gastrectomy with bypass gastrogastrostomy	43.89
Total gastrectomy with intestinal interposition	43.91
Other total gastrectomy	43.99
<b>Colonic resection</b>	
Laparoscopic multiple segmental resection of large intestine	17.31
Laparoscopic cecectomy	17.32
Laparoscopic right hemicolectomy	17.33
Laparoscopic resection of transverse colon	17.34
Laparoscopic left hemicolectomy	17.35
Laparoscopic sigmoidectomy	17.36
Other laparoscopic partial excision of large intestine	17.39
Laparoscopic total intra-abdominal colectomy	45.81
Open total intra-abdominal colectomy	45.82
Other and unspecified total intra-abdominal colectomy	45.83
Open and other multiple segmental resection of large intestine	45.71
Open and other cecectomy	45.72
Open and other right hemicolectomy	45.73
Open and other resection of transverse colon	45.74
Open and other left hemicolectomy	45.75
Open and other sigmoidectomy	45.76
Other and unspecified partial excision of large intestine	45.79
<b>Hepatic resection</b>	
Marsupialization of lesion of liver	50.21
Partial hepatectomy	50.22
Open ablation of liver lesion or tissue	50.23
Percutaneous ablation of liver lesion or tissue	50.24
Laparoscopic ablation of liver lesion or tissue	50.25
Other and unspecified ablation of liver lesion or tissue	50.26
Other destruction of lesion of liver	50.29
Lobectomy of liver	50.3
<b>Pancreatic resection</b>	
Proximal pancreatectomy	52.51
Distal pancreatectomy	52.52
Radical subtotal pancreatectomy	52.53
Other partial pancreatectomy	52.59

Total pancreatectomy	52.6
Radical pancreaticoduodenectomy	52.7

**Rectal resection**

Abdominoperineal resection of the rectum, not otherwise specified	48.50
Laparoscopic abdominoperineal resection of the rectum	48.51
Open abdominoperineal resection of the rectum	48.52
Other abdominoperineal resection of the rectum	48.59
Transsacral rectosigmoidectomy	48.61
Anterior resection of rectum with synchronous colostomy	48.62
Other anterior resection of rectum	48.63
Posterior resection of rectum	48.64
Duhamel resection of rectum	48.65
Other partial proctectomy, rectal resection NOS	48.69
Pull-through resection of rectum, not otherwise specified	48.40
Soave submucosal resection of rectum	48.41
Laparoscopic pull-through resection of rectum	48.42
Open pull-through resection of rectum	48.43
Other pull-through resection of rectum	48.49

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**Supplemental Table 3.** International Classification of Diseases, 9<sup>th</sup> revision, Clinical Modification diagnosis codes for perioperative/postoperative in-hospital complications

<b>Complication</b>	<b>ICD-9-CM</b>
<b>Mechanical wound</b>	
Delayed wound healing	998.83
Postoperative hematoma	998.12
Postoperative seroma (non-infected)	998.13
Disruption of operative wound	998.30-2
Persistent postoperative fistula	998.6
<b>Infection</b>	
Postoperative infection	998.5
Postoperative skin disease	998.59
Postoperative septic wound complication	998.59
Postoperative skin infection	998.59
Postoperative intra-abdominal abscess	998.59
Postoperative sub-diaphragmatic abscess	998.59
Postoperative infected seroma	998.51
Sepsis/Septicemia	038.0-9; 995.91-2
<b>Urinary complication</b>	
Postoperative urinary retention	997.5
Postoperative urinary tract infection	996.64; 997.5
<b>Pulmonary complication</b>	
Ventilator associated pneumonia	997.31
Post-procedural aspiration pneumonia	997.32
Other respiratory complications	997.39
Postoperative acute respiratory insufficiency	518.5
Iatrogenic pneumothorax	512.1
Postoperative air leak	512.2
Adult Respiratory Distress Syndrome (ARDS)	518.5
Postoperative pulmonary edema	518.4
<b>Gastrointestinal tract (GI) complication</b>	
Postoperative small bowel obstruction	997.4
Postoperative ileus	997.4
Postoperative ileus requiring nasogastric tube	997.4
Postoperative nausea	997.4
Postoperative vomiting	997.4
Postoperative pancreatitis	997.4
Other digestive system complications	997.49
<b>Cardiovascular complication</b>	
Postoperative deep venous thrombosis	997.79
Postoperative pulmonary embolism	415.11
Postoperative stroke	997.02
Phlebitis or thrombophlebitis from procedure	997.2
Cardiac arrest/insufficiency during or resulting from procedure	997.1
<b>Systemic complication</b>	
Postoperative shock (septic, hypovolemic)	998.0
Other specified complications of procedure not elsewhere classified	998.89
Unspecified complication of procedure not elsewhere classified	

	998.9
<b>Complications during surgical procedure</b>	
Accidental puncture or laceration, complicating surgery	998.2
Foreign body accidentally left during procedure	998.4
Hemorrhage/bleeding, complicating surgery	998.11

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