

## Name of measure: Failure to Rescue 30-Day Mortality

<b>MEASURE SPECIFICATIONS</b>	
NAME OF MEASURE	Failure to Rescue 30-Day Mortality
NUMERATOR/DENOMINATOR	<p>Numerator: patients who died with a complication + patients who died without documented complications. Death is defined as death within 30 days from admission.</p> <p>Denominator: General Surgery, Orthopedic and Vascular patients with complications + patients who died without complications within 30 days of admission.</p> <p>(In the numerator and the denominator, in hospital deaths may also be used instead of 30 day mortality.)</p>
INCLUSIONS/EXCLUSIONS	<p>Inclusions: Adult patients admitted for one of the procedures in the General Surgery, Orthopedic or Vascular DRGs (see Appendix A).</p> <p>Exclusions: Patients over age 90, under age 18.</p>
DATA SOURCES	Linked patients hospitalizations claims records, such as MEDPAR; can also use unlinked data if linked files are not available to identify comorbidities and develop definitions of severity and other risk measure.
DATA ELEMENT DEFINITION AND ALLOWABLE VALUES	<p>Death is defined as death within 30 days from admission.</p> <p>Complicated patient has at least one of the complications defined in Appendix B. Complications are defined using the secondary ICD9 diagnosis and procedure codes and the DRG code of the current admission.<sup>†</sup></p> <p>Comorbidities are defined in Appendix C using secondary ICD9 diagnosis codes of the current admission and primary or secondary ICD9 diagnosis codes of previous admission within 90 days of the admission date of the current admission.<sup>†</sup></p>
DATA ANALYSIS LOGIC AND METHOD	<p>Failure-to-rescue is defined as the probability of death following a complication. To understand FTR, it helps to display the definition of the probability of death as the sum of two quantities shown below :</p> $P(d) = P(d c)*P(c) + P(d no\ c)*P(no\ c)$

<sup>†</sup> When Physician Part B file is available, the definition of complications and comorbidities are augmented to include CPT codes.

	<p>The probability of dying is equal to the probability of dying given a complication multiplied by the probability of a complication plus the probability of dying without a complication multiplied by the probability of not developing a complication. In the case of most surgical procedures, one can envision that the second term approaches zero because one is unlikely to die without some complication, given that the surgery was performed. Hence, we can think of the probability of death as equal to the probability of dying given a complication multiplied by the probability of developing a complication. The probability of dying given a complication is defined as failure-to-rescue.</p> <p>To conduct a failure-to-rescue analysis a set of complications available in the dataset must be defined, with the intent of having as many deaths as possible in the dataset preceded by a complication. To construct an FTR analysis we start by constructing a 2-by-2 table to display the rates of in-hospital death, complication and failure-to-rescue. To account for the deaths occurring without a documented complication, the FTR recodes all patients who died without a complication as if they died with an undocumented complication. If the list of complications is comprehensive, the number of undocumented complications prior to death is low, and the recoding of failures needed to include these undocumented complications is minimal.</p>
RISK-ADJUSTMENT METHOD <u>AND</u> ASSOCIATED DATA ELEMENTS	<p>Risk Adjustment: Model was developed using logistic regression analysis.<sup>1,2</sup></p> <p>Associated data elements: age in years, sex, race, comorbidities, DRGs (combined with and without complications) and procedure codes within DRGs,<sup>‡</sup> transfer status.</p>
COHORT DEFINITION AND SAMPLING METHOD	All surgical patients between ages 18 and 90 admitted to an acute care hospital.
HOW LONG HAS THE MEASURE BEEN IN USE AND FOR WHAT PURPOSE (quality improvement, accountability, surveillance)?	Since 1992 to assess quality of care of acute care hospitals, to identify hospital and provider characteristics associated with higher quality of care, to assess the impact of changes in policy on hospital quality of care. <sup>3-8</sup>
DESCRIBE RELIABILITY TESTS AND RELEVANT CITATIONS	Split half sample reliability had a correlation of .314, similar to 30 day mortality (.296). <sup>2</sup>
DESCRIBE VALIDITY TESTS AND RELEVANT	a) Rank correlation between various hospital

<sup>‡</sup> Detailed list of DRGs and ICD9 procedure codes available from the investigator upon request.

CITATIONS	<p>outcomes (Death, Failure to Rescue, Complications, other measures of Failure to Rescue, Failure to Rescue Complement measures)</p> <p>b) Marginal and partial coefficients in logit models using detailed patient characteristics and hospital characteristics shown to be associated with better outcomes in previous studies.<sup>2, 7</sup> The marginal results use one hospital characteristic at a time along with all patient characteristics. “Partial” regression results, using all hospital and patient variables simultaneously have the disadvantage that correlation between hospital characteristics can cause difficulty in interpreting the effects of individual hospital variables. Hospital characteristics associated with better outcomes (1) teaching hospital status (member of the American Council of Teaching Hospitals); (2) high technology status (does the hospital perform open heart surgery or perform organ transplantation); (3) hospital size greater than 200 beds; (4) bed-to-nurse ratio (where nurses are the sum of RN plus LPN FTE positions); and (5) nursing skill mix (the ratio of RN/(RN+LPN)).<sup>2-8</sup></p> <p>c. The relative contribution of patient-to-hospital characteristics that predicted each outcome of interest, as provided by the omega statistic.<sup>2, 9</sup> The omega statistic computes a ratio of the squared sum of the log odds for model patient variables divided by a similar quantity calculated for the model hospital variables. All else being equal, outcome measures that have lower omega ratios may be more desirable quality indicators, since the lower the omega, the greater the hospital’s impact on outcome relative to the patient’s impact. This is especially important if modeling patient severity is difficult (as with claims data) so that the lower the omega suggests the higher relative influence of hospital characteristics as compared to patient characteristics.</p>
METHODOLOGY FOR UPDATING MEASURES	Periodic review of DRG codes, ICD9 diagnosis codes, ICD9 procedure codes, and CPT codes.
ADDITIONAL REFERENCES	N/A

Note 1: FTR is adjusted using a logistic regression model where y is a failure and the total N is composed of patients who develop a complication and patients who died without a complication.

Note 2: FTR can be defined with either 30-day mortality or in hospital mortality (see references 1 and 2). Generally, we have seen very similar results using either death definition.

Note 3: The model adjustment variables can vary. We have found that FTR results are fairly stable, even with little adjustment (see references 1, 6, 8, and 10) since all patients in an FTR analysis have developed a complication, (by definition), they are a more homogenous group of patients than the entire population. Hence severity adjustment plays somewhat less of a role than in other outcome measures.

## REFERENCES

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5. Silber JH, Kennedy SK, Even-Shoshan O, et al. Anesthesiologist direction and patient outcomes. *Anesthesiology*. 2000;93:152-163.
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9. Silber JH, Rosenbaum PR, Ross RN. Comparing the contributions of groups of predictors: Which outcomes vary with hospital rather than patient characteristics? *J Am Stat Assoc*. 1995;90:7-18.

## APPENDICES

**Appendix A: List of DRGs**

**Appendix B: List of Complications and their definitions**

**Appendix C: List of Comorbidities and their definitions**

## **APPENDIX A: DRGs for which the Failure to Rescue measure has been developed at the Center for Outcomes Research**

### **General Surgical DRGs**

#### **MDC 6 – Digestive System**

- 146 Rectal resection with complications
- 147 Rectal resection without complications
- 148 Major small & large bowel procedures with complications
- 149 Major small & large bowel procedures without complications
- 150 Peritoneal adhesiolysis with complications
- 151 Peritoneal adhesiolysis without complications
- 152 Minor small & large bowel procedures with complications
- 153 Minor small & large bowel procedures without complications
- 154 Stomach, esophageal & duodenal procedures age >17 with complications
- 155 Stomach, esophageal & duodenal procedures age >17 without complications
- 157 Anal & stomal procedures with complications
- 158 Anal & stomal procedures without complications
- 159 Hernia procedures except inguinal & femoral age >17 with complications
- 160 Hernia procedures except inguinal & femoral age >17 without complications
- 161 Inguinal & femoral hernia procedures age >17 with complications
- 162 Inguinal & femoral hernia procedures age >17 without complications
- 164 Appendectomy with complicated principal diagnosis with complications
- 165 Appendectomy with complicated principal diagnosis without complications
- 166 Appendectomy without complicated principal diagnosis with complications
- 167 Appendectomy without complicated principal diagnosis without complications
- 170 Other digestive system O.R. procedures with complications
- 171 Other digestive system O.R. procedures without complications

#### **MDC 7 Hepatobiliary**

- 191 Pancreas, liver & shunt procedures with complications
- 192 Pancreas, liver & shunt procedures without complications
- 193 Biliary tract procedure except only cholecyst. With or without CDE with complications
- 194 Biliary tract procedure except only cholecyst. With or without CDE without complic.
- 195 Cholecystectomy with CDE with complications
- 196 Cholecystectomy with CDE without complications
- 197 Cholecystectomy except by laparoscope without CDE with complications
- 198 Cholecystectomy except by laparoscope without CDE without complications
- 493 Laparoscopic Cholecystectomy without CDE with complications
- 494 Laparoscopic Cholecystectomy without CDE without complications
- 199 Hepatobiliary diagnostic procedure for malignancy
- 200 Hepatobiliary diagnostic procedure for non-malignancy
- 201 Other hepatobiliary or pancreas O.R. procedures

**APPENDIX A: DRGs for which the Failure to Rescue measure has been developed at the Center for Outcomes Research (continued)**

**MDC 9 Skin, subcutaneous tissue, breast**

- 257 Total mastectomy for malignancy with complications
- 258 Total mastectomy for malignancy without complications
- 259 Subtotal mastectomy for malignancy with complications
- 260 Subtotal mastectomy for malignancy without complications
- 261 Breast procedures for non-malignancy except biopsy & local excision
- 262 Breast biopsy & local excision for non-malignancy
- 263 Skin graft &/or debrid for skin ulcer or cellulitis with complications
- 264 Skin graft &/or debrid for skin ulcer or cellulitis without complications
- 265 Skin graft &/or debrid except for skin ulcer or cellulitis with complications
- 266 Skin graft &/or debrid except for skin ulcer or cellulitis without complications
- 267 Perianal & pilonidal procedures
- 268 Skin, subcutaneous tissue & breast plastic procedures

**MDC 10 Endocrine, nutritional, metabolic**

- 285 Amputation of lower limb for endocrine, nutritional & metabolic disorders
- 286 Adrenal & pituitary procedures
- 287 Skin grafts & wound debrid for endocrine, nutritional & metabolic disorders
- 288 O.R. procedures for obesity
- 289 Parathyroid procedures
- 290 Thyroid procedures
- 291 Thyroglossal procedures
- 292 Other endocrine, nutritional & metabolic OR procedures with complications
- 293 Other endocrine, nutritional & metabolic OR procedures without complications

**Orthopedic DRGs**

**MDC 8 Musculoskeletal and connective tissue**

- 209 Major joint & limb reattachment procedures of lower extremity
- 210 Hip & femur procedures except major joint age >17 with complications
- 211 Hip & femur procedures except major joint age >17 without complications
- 213 Amputation for musculoskeletal system & connective tissue disorder
- 216 Biopsies of musculoskeletal system & connective tissue
- 217 Wound debridement & skin graft except hand for musculoskeletal & connective tissue
- 218 Lower extremity & humerus procedure except hip, foot, femur age >17 with compl.
- 219 Lower extremity & humerus procedure except hip, foot, femur age >17 without compl.
- 223 Major shoulder, elbow procedure, or other upper extremity procedure with compl.
- 224 Shoulder, elbow or forearm procedure, except major joint procedure without compl.
- 491 Major joint and limb reattachment procedures of upper extremity

**APPENDIX A: DRGs for which the Failure to Rescue measure has been developed at the Center for Outcomes Research (continued)**

- 225 Foot procedures
- 226 Soft tissue procedures with complications
- 227 Soft tissue procedures without complications
- 228 Major thumb or joint procedure, or other hand or wrist procedure with complications
- 229 Hand or wrist procedure, except major joint procedure without complications
- 230 Local excision & removal of internal fixed devices of hip & femur
- 231 Local excision & removal of internal fixed devices except hip & femur
- 232 Arthroscopy
- 233 Other musculoskeletal system & connective tissue OR procedures with compl.
- 234 Other musculoskeletal system & connective tissue OR procedures without compl.
- 471 Bilateral or multiple major joint procedures of lower extremity
- 496 Combined anterior/posterior spinal fusion
- 497 Spinal fusion with cc
- 498 Spinal fusion without cc
- 499 Back and neck procedures except spinal fusion with cc
- 500 Back and neck procedures except spinal fusion without cc
- 501 Knee procedures with PDX of infection with cc
- 502 Knee procedures with PDX of infection without cc
- 503 Knee procedures without PDX of infection

**Vascular Surgery DRGs**

- 110 Major cardiovascular procedures with cc
- 111 Major cardiovascular procedures without cc
- 112 Percutaneous cardiovascular procedures
- 113 Amputation for circulatory system disorders except upper limb and toe
- 114 Upper limb and toe amputation for circulatory system disorders
- 119 Vein ligation and stripping
- 120 Other circulatory system O.R. procedures

**Electronic APPENDIX B: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (\*) (Unless otherwise specified, all diagnosis and procedure codes are secondary codes)**

	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
General Structure	1) General, orthopedic, and vascular surgery 2) Secondary diagnosis code and/or procedure code as specified below	Exclusion noted for each complication of care as specified in each row below
1. Cardiac Event	<b>Secondary diagnosis codes:</b> 41189, 99601 or 9971 and any of (7943, 42612-3, 42689, 42731, 42781, 9)  <b>Secondary procedure codes:</b> 3778, 3780-3, 3606	
2. Cardiac Emergency	<b>Secondary diagnosis codes:</b> 4100, 41001, 4101, 41011, 4102, 41021, 4103, 41031, 4104, 41041, 4105, 41051, 4106, 41061, 4107, 41071, 4108, 41081, 4109, 41091, 4271, 4275, 42741, 7855, 78550-1  <b>Secondary procedure codes:</b> 3761, 3791, 8964, 9960-4, 9, 9961-2, or (9363, 996) and exclusion	<b>Principal diagnosis codes:</b> 4275, 7855, 78550-1, 9, 7991  <b>Principal procedure codes:</b> 9393, 996, 9963  <b>DRG</b> DRG = 75-145, 475  <i>1) Traumas as defined by principal diagnoses</i> 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 817, 818, 819, 820, 821, 822, 823, 824, 825, 827, 828, 829, 830, 831, 832, 833, 835, 836, 837, 838, 839, 850, 851, 852, 853, 854, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 884, 887, 890, 891, 892, 894, 896, 897, 900, 901, 902, 903, 904, 925, 926, 927, 928, 929, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 952, 953, 958  <i>2) Trauma DRGs</i> 002, 027, 028, 029, 031, 032, 072, 083, 084, 235, 236, 237, 440, 441, 442, 443, 444, 445, 446, 456, 457, 458, 459, 460, 484, 485, 486, 487, 491, 504, 505, 506, 507, 508, 509, 510, 511  <i>3) GI Hemorrhage as defined by principal diagnosis</i> 456.0, 456.20, 530.7, 531.00, 531.01, 531.20, 531.21, 531.40, 531.41, 531.60, 531.61, 532.00, 532.01, 532.20, 532.21, 532.40, 532.41, 532.60, 532.61, 533.00, 533.01, 533.20, 533.21, 533.40, 533.41,

(\*) Comprehensive definitions of complications utilize CPT codes in addition to ICD-9 diagnosis and procedure codes and DRG codes. For this study we did not have available Medicare Physician Part B files with CPT codes. Readers interested in the list of CPT codes that define complications should contact the author.

Electronic APPENDIX B: Definitions of complications used to create the traditional FTR (cont.)

	Inclusion criteria	Exclusion criteria
		533.60, 533.61, 534.00, 534.01, 534.20, 534.21, 534.40, 534.41, 534.60, 534.61, 535.01, 535.11, 535.21, 535.31, 535.41, 535.51, 535.61, 578.0, 578.1, 578.9
3. CHF	<b>Secondary diagnosis codes:</b> 5184, 42821, 42831, 42841, 42823, 42833, 42843, or 9971 and any of (428, 4280-1, 4289, 42820-1, 42823, 42830-1, 42833, 42840-1, 42843) or (428, 4280-1, 9, 4289, 42820, 1, 3, 42830-1, 3, 42840-1, 3) and exclusion	History of CHF defined as any of the following diagnoses during a look back period of 180 days: 39891, 40201, 40211, 40291, 40401, 3, 40411, 3, 40491, 3, 428, 4280, 4281, 42820-3, 42830-3, 42840-3, 4289, 5184
4. Hypotension/Shock/ Hypovolemia	<b>Secondary diagnosis codes:</b> 2765, 4589, 78550-2, 78559, 7963, 9950, 9954, 9980	
5. Pulmonary embolus	<b>Secondary diagnosis codes:</b> 4151, 41511, 41519, 4539, 9581  <b>Secondary procedure codes:</b> 8843, 9215	
6. Deep Vein Thrombosis/ Arterial Clot	<b>Secondary diagnosis codes:</b> 4440-2, 4420-1, 4448, 44420, 44421, 44481, 9, 4449, 4538  <b>Secondary procedure codes:</b> 387, 8866, 8877	
7. Phlebitis	<b>Secondary diagnosis codes:</b> 4510-1, 45111, 9, 4512, 4518, 45181-2, 4, 9, 4519  <b>Secondary procedure codes:</b> 387, 8866, 8877	
8. Cerebrovascular Accident (CVA)/Stroke	<b>Secondary diagnosis codes:</b> (431, 432, 43301, 43311, 43321, 43331, 43381, 43391, 434, 4340-1, 4341, 43411, 4349, 43491, 436, 99702) and exclusion  <b>Secondary procedure codes:</b> 8703, 8891	History of CVA/stroke defined as any of the following diagnoses during a look back period of 180 days: 431, 432, 43301, 43311, 43321, 43331, 43381, 43391, 434, 4340, 43401, 4341, 43411, 4349, 43491, 436, 99702, 438, 4380, 4381, 43810, 43811, 43812, 43819, 4382, 43820, 43821, 43822, 4383, 43830, 43831, 43832, 4384, 43840, 43841, 43842, 4385, 43850, 43851, 43852, 43853, 4386, 4387, 4388, 43881, 43882, 43883, 43884, 43885, 43889, 4389, V1259
9. Transient Ischemic Attack (TIA)	<b>Secondary diagnosis codes:</b> 4350-3, 4358-9	
10. Coma	<b>Secondary diagnosis codes:</b> 3481, 5722, 7800, 78001, 9	

Electronic APPENDIX B: Definitions of complications used to create the traditional FTR (cont.)

	Inclusion criteria	Exclusion criteria
11. Seizure	<p><b>Secondary diagnosis codes:</b> (7803, 78031, 9) and exclusion</p> <p><b>Secondary procedure codes:</b> 8914, 8919</p>	<p>History of seizure defined as any of the following diagnoses during a look back period of 180 days: 345, 3450, 34500, 34501, 3451, 34510, 34511, 3452, 3453, 3454, 34540, 34541, 3455, 34550, 34551, 3456, 34560, 34561, 3457, 34570, 34571, 3458, 34580, 34581, 3459, 34590, 34591, 7803</p>
12. Psychosis	<p><b>Secondary diagnosis codes:</b> 292, 2920, 2921, 29211-2, 2922, 2928, 29281-4, 9, 2929, 2930, 2939, 2948, 2949</p>	
13. Nervous System Complications	<p><b>Secondary diagnosis codes:</b> 9970</p> <p><b>Secondary procedure codes:</b> 0331, 8914, 8919</p>	
14. Pneumonia-Aspiration	<p><b>Secondary diagnosis codes:</b> 5070-1, 5078 or 9973 and any of 4829, 485, or 486</p>	
15. Pneumonia, other	<p><b>Secondary diagnosis codes:</b> 481, 4820-3, 48230-2, 9, 4824, 48240-1, 9, 4828, 48281-4, 9, 4829, 485, 486 or (9973, 514) and exclusion</p>	<p><b>DRG</b> DRG=75-102, 475</p> <p><b>Any diagnosis codes:</b> <i>1) Viral Pneumonia</i> 480.0, 480.1, 480.2, 480.8, 480.9, 483, 483.0, 483.1, 483.8, 484.1, 484.3, 484.5, 484.6, 484.7, 484.8, 487.0, 487.1, 487.8</p> <p><i>2) Immunocompromised State</i> 042, 136.3, 279.00, 279.01, 279.02, 279.03, 279.04, 279.05, 279.06, 279.09, 279.10, 279.11, 279.12, 279.13, 279.19, 279.2, 279.3, 279.4, 279.8, 279.9</p>
16. Pneumothorax	<p><b>Secondary diagnosis codes:</b> 5120, 5128, 5180</p> <p><b>Secondary procedure codes:</b> 3404, 3491</p>	
17. Respiratory Compromise	<p>DRG = 483</p> <p><b>Secondary diagnosis codes:</b> 5185, 51881, 9, 7991</p> <p><b>Secondary procedure codes:</b> 311, 312, 3121, 9, 390, 9604, 9670-2</p>	

Electronic APPENDIX B: Definitions of complications used to create the traditional FTR (cont.)

	Inclusion criteria	Exclusion criteria
18. Bronchospasm	<p><b>Secondary diagnosis codes:</b> 5191</p> <p><b>Secondary procedure codes:</b> 8938, 9394</p>	
19. Other Respiratory Complication	<p><b>Secondary procedure codes:</b> 3321, 3327, 9390</p>	
20. Internal Organ Damage	<p><b>Secondary diagnosis codes:</b> 9981, 99811-3, 9982</p> <p><b>Secondary procedure codes:</b> (3941, 5412, 9) and exclusion</p>	<p><b>Principal procedure codes:</b> 444, 4440-2, 4491</p>
21. Perforation	<p><b>Secondary diagnosis codes:</b> 5304, 56983, 9982</p>	
22. Peritonitis	<p><b>Secondary diagnosis codes:</b> 5670-2, 8, 9, 5695, 7894</p> <p><b>Secondary procedure codes:</b> 5491 and exclusion</p>	<p>Diagnosis of cancer as principal diagnosis or as a comorbidity of cancer defined in Appendix B.1, as secondary diagnoses or in a look back period of 180 days.</p>
23. GI Bleed and Blood Loss	<p><b>Secondary diagnosis codes:</b> [2851 or (5780-1, 9) and exclusion or 5307 and exclusion or any of (4560, 45620, 53082, 53100-1, 53120-1, 53130-1, 53190-1, 53200-1, 53210-1, 53220-1, 53230-1, 53290-1, 53300-1, 53310-1, 53320-1, 53330-1, 53390-1, 53400-1, 53410-1, 53420-1, 53430-1, 53490-1, 53501, 53511, 53540-1, 53551, 53561, 53784, 56212-3, 5693, 56985, 5789) and exclusion] and exclusion of Trauma defined by DRG or by principal diagnosis or History of alcoholism</p> <p><b>Secondary procedure codes:</b> 4995</p>	<p>1) <i>Trauma as defined by principal diagnoses</i> 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 817, 818, 819, 820, 821, 822, 823, 824, 825, 827, 828, 829, 830, 831, 832, 833, 835, 836, 837, 838, 839, 850, 851, 852, 853, 854, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 884, 887, 890, 891, 892, 894, 896, 897, 900, 901, 902, 903, 904, 925, 926, 927, 928, 929, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 952, 953, 958</p> <p>2) <i>Trauma DRGs</i> 002, 027, 028, 029, 031, 032, 072, 083, 084, 235, 236, 237, 440, 441, 442, 443, 444, 445, 446, 456, 457, 458, 459, 460, 484, 485, 486, 487, 491, 504, 505, 506, 507, 508, 509, 510, 511</p> <p>3) <i>History of alcoholism defined as secondary diagnosis</i> 2910-5, 29181, 29189, 2919, 30300-3, 30390-2, 30500-2</p> <p><b>Principal procedure codes:</b> 444, 4440-2 if secondary diagnoses 5780-1, 9</p>

Electronic APPENDIX B: Definitions of complications used to create the traditional FTR (cont.)

	Inclusion criteria	Exclusion criteria
		444, 4440-2 and 4491 if secondary procedure = 4995  <b>DRG</b> 1) DRG = 146-171 if secondary procedure = 5307  2) DRG = 146-167, 170-184, 188-208 if any of the secondary diagnoses in the inclusion are in the set of diagnoses 4560-5789
24. Sepsis	<b>Secondary diagnosis codes:</b> 0380-4, 03810-1, 03840-4, 9, 03819, 0388-9, 78552, 7907	
25. Deep Wound Infection	<b>Secondary diagnosis codes:</b> 9983, 99831-2, 9985, 99859, 9986, 99883  <b>Secondary procedure codes:</b> 5461, 8604, 8659, 8622, 8660-3, 8670, 8674	
26. Renal Dysfunction	<b>Secondary diagnosis codes:</b> 5845-9, 7885  <b>Secondary procedure codes:</b> (3995, 5494, 5498, 598, 8607, 8962) and exclusion	Comorbidity of renal failure defined as any of the following diagnoses 40301, 40311, 40391, 40402, 40403, 40412, 40413, 40492, 40493, 584, 5845, 5846, 5847, 5848, 5849, 585, 586, V420, V451, V560, V561, V562, V563, V5631, V5632, V568 or principal procedure 3995 during 180 day look back period:
27. Gangrene/Amputation	<b>Secondary diagnosis codes:</b> 72886, 7854  <b>Secondary procedure codes:</b> (840, 8401-9, 841, 8410-9) and exclusion	<b>Principal procedure codes:</b> 840, 8401-9, 841, 8410-9
28. Intestinal Obstruction	<b>Secondary diagnosis codes:</b> (5570, 56081, 5609, 9974) and exclusion	<b>DRG</b> DRG = 148-153  <b>Principal diagnosis codes:</b> 5570, 56081, or 5609
29. Return to Surgery	<b>Secondary diagnosis codes:</b> 9984, 9987  <b>Secondary procedure codes:</b> 3403, 3409, 5411-2, 5492	

Electronic APPENDIX B: Definitions of complications used to create the traditional FTR (cont.)

	Inclusion criteria	Exclusion criteria
30. Decubitus Ulcer	<b>Secondary diagnosis codes:</b> 7070, 70700-7, 9  <b>Secondary procedure codes:</b> 8622	
31. Orthopedic Complication	<b>Secondary diagnosis codes:</b> (9964, 99666, 99677) and exclusion  <b>Secondary procedure codes:</b> 7971, 7975-6, or ( 7860, 7869) and exclusion	<b>Principal procedure codes:</b> 8153, 8155, 8183
32. Compartment Syndrome	<b>Secondary diagnosis codes:</b> 9588 or 99889 AND <b>Secondary procedure codes:</b> 8314	
33. Hepatitis/Jaundice	<b>Secondary diagnosis codes:</b> 570, 5733	
34. Pancreatitis	<b>Secondary diagnosis codes:</b> 5770	
35. Necrosis of the Bone- Thermal or Aseptic	<b>Secondary diagnosis codes:</b> 73340-4, 9	
36. Osteomyelitis	<b>Secondary diagnosis codes:</b> (7300, 73000-9, 7302, 73020-9, 99667) and exclusion	<b>Primary diagnosis codes:</b> 7300, 73000-9, 7302, 73020-9
37. Disseminated Intravascular Coagulopathy (DIC)	<b>Secondary diagnosis codes:</b> 2866  <b>Secondary procedure codes:</b> 9907	
38. Pyelonephritis	<b>Secondary diagnosis codes:</b> 5901, 59010-1, 5902-3, 8, 59080, 5909	
39. Post Surgical Complication	<b>Secondary diagnosis codes:</b> 99700-1, 9972, 9975, 99851-2, 9988, 99881-2, 9, 9989, 9990-9	

**Electronic APPENDIX B.1: Exclusion criteria for cancer in peritonitis complication definition:  
Diagnosis of cancer as principal diagnosis or as a comorbidity of cancer:**

140, 1400, 1401, 1403, 1404, 1405, 1406, 1408, 1409, 141, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1418, 1419, 142, 1420, 1421, 1422, 1428, 1429, 143, 1430, 1431, 1438, 1439, 144, 1440, 1441, 1448, 1449, 145, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1458, 1459, 146, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 147, 1470, 1471, 1472, 1473, 1478, 1479, 148, 1480, 1481, 1482, 1483, 1488, 1489, 149, 1490, 1491, 1498, 1499, 150, 1500, 1501, 1502, 1503, 1504, 1505, 1508, 1509, 151, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1518, 1519, 152, 1520, 1521, 1522, 1523, 1528, 1529, 153, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 154, 1540, 1541, 1542, 1543, 1548, 155, 1550, 1551, 1552, 156, 1560, 1561, 1562, 1568, 1569, 157, 1570, 1571, 1572, 1573, 1574, 1578, 1579, 158, 1580, 1588, 1589, 159, 1590, 1591, 1598, 1599, 160, 1600, 1601, 1602, 1603, 1604, 1605, 1608, 1609, 161, 1610, 1611, 1612, 1613, 1618, 1619, 162, 1620, 1622, 1623, 1624, 1625, 1628, 1629, 163, 1630, 1631, 1638, 1639, 164, 1640, 1641, 1642, 1643, 1648, 1649, 165, 1650, 1658, 1659, 170, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 171, 1710, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 172, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 173, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 174, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1748, 1749, 175, 1750, 1759, 176, 1760, 1761, 1762, 1763, 1764, 1765, 1768, 1769, 179, 180, 1800, 1801, 1808, 1809, 181, 182, 1820, 1821, 1828, 183, 1830, 1832, 1833, 1834, 1835, 1838, 1839, 184, 1840, 1841, 1842, 1843, 1844, 1848, 1849, 185, 186, 1860, 1869, 187, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 188, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 189, 1890, 1891, 1892, 1893, 1894, 1898, 1899, 190, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 191, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 192, 1920, 1921, 1922, 1923, 1928, 1929, 193, 194, 1940, 1941, 1943, 1944, 1945, 1946, 1948, 1949, 195, 1950, 1951, 1952, 1953, 1954, 1955, 1958, 196, 1960, 1961, 1962, 1963, 1965, 1966, 1968, 1969, 197, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 198, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 19881, 19882, 19889, 199, 1990, 1991, 200, 2000, 20000, 20001, 20002, 20003, 20004, 20005, 20006, 20007, 20008, 2001, 20010, 20011, 20012, 20013, 20014, 20015, 20016, 20017, 20018, 2002, 20020, 20021, 20022, 20023, 20024, 20025, 20026, 20027, 20028, 2008, 20080, 20081, 20082, 20083, 20084, 20085, 20086, 20087, 20088, 201, 2010, 20100, 20101, 20102, 20103, 20104, 20105, 20106, 20107, 20108, 2011, 20110, 20111, 20112, 20113, 20114, 20115, 20116, 20117, 20118, 2012, 20120, 20121, 20122, 20123, 20124, 20125, 20126, 20127, 20128, 2014, 20140, 20141, 20142, 20143, 20144, 20145, 20146, 20147, 20148, 2015, 20150, 20151, 20152, 20153, 20154, 20155, 20156, 20157, 20158, 2016, 20160, 20161, 20162, 20163, 20164, 20165, 20166, 20167, 20168, 2017, 20170, 20171, 20172, 20173, 20174, 20175, 20176, 20177, 20178, 2019, 20190, 20191, 20192, 20193, 20194, 20195, 20196, 20197, 20198, 202, 2020, 20200, 20201, 20202, 20203, 20204, 20205, 20206, 20207, 20208, 2021, 20210, 20211, 20212, 20213, 20214, 20215, 20216, 20217, 20218, 2022, 20220, 20221, 20222, 20223, 20224, 20225, 20226, 20227, 20228, 2023, 20230, 20231, 20232, 20233, 20234, 20235, 20236, 20237, 20238, 2024, 20240, 20241, 20242, 20243, 20244, 20245, 20246, 20247, 20248, 2025, 20250, 20251, 20252, 20253, 20254, 20255, 20256, 20257, 20258, 2026, 20260, 20261, 20262, 20263, 20264, 20265, 20266, 20267, 20268, 2028, 20280, 20281, 20282, 20283, 20284, 20285, 20286, 20287, 20288, 2029, 20290, 20291, 20292, 20293, 20294, 20295, 20296, 20297, 20298, 203, 2030, 20300, 20301, 2031, 20310, 20311, 2038, 20380, 20381, 204, 2040, 20400, 20401, 2041, 20410, 20411, 2042, 20420, 20421, 2048, 20480, 20481, 2049, 20490, 20491, 205, 2050, 20500, 20501, 2051, 20510, 20511, 2052, 20520, 20521, 2053, 20530, 20531, 2058, 20580, 20581, 2059, 20590, 20591, 206, 2060, 20600, 20601, 2061, 20610, 20611, 2062, 20620, 20621, 2068, 20680, 20681, 2069, 20690, 20691, 207, 2070, 20700, 20701, 2071, 20710, 20711, 2072, 20720, 20721, 2078, 20780, 20781, 208, 2080, 20800, 20801, 2081, 20810, 20811, 2082, 20820, 20821, 2088, 20880, 20881, 2089, 2386, 2733, V10, V100, V1000, V1001, V1002, V1003, V1004, V1005, V1006, V1007, V1009, V101, V1011, V1012, V102, V1020, V1021, V1022, V1029, V103, V104, V1040, V1041, V1042, V1043, V1044, V1045, V1046, V1047, V1048, V1049, V105, V1050, V1051, V1052, V1053, V1059, V106, V1060, V1061, V1062, V1063, V1069, V107, V1071, V1072, V1079, V108, V1081, V1082, V1083, V1084, V1085, V1086, V1087, V1088, V1089

## **APPENDIX C: Definitions of comorbidities (unless otherwise specified, all secondary diagnoses)**

### **Heart Failure**

39891, 40201, 40211, 40291, 40401, 40403, 40411, 40413, 40491, 40493, 428, 4280, 4281, 42820, 42821, 42822, 42823, 42830, 42831, 42832, 42833, 42840, 42841, 42842, 42843, 4289, 5184

### **Stroke**

431, 432, 43301, 43311, 43321, 43331, 43381, 43391, 434, 4340, 43401, 4341, 43411, 4349, 43491, 436, 99702, 438, 4380, 4381, 43810, 43811, 43812, 43819, 4382, 43820, 43821, 43822, 4383, 43830, 43831, 43832, 4384, 43840, 43841, 43842, 4385, 43850, 43851, 43852, 43853, 4386, 4387, 4388, 43881, 43882, 43883, 43884, 43885, 43889, 4389, V1259

### **Seizures**

345, 3450, 34500, 34501, 3451, 34510, 34511, 3452, 3453, 3454, 34540, 34541, 3455, 34550, 34551, 3456, 34560, 34561, 3457, 34570, 34571, 3458, 34580, 34581, 3459, 34590, 34591, 7803

### **Dementias**

290, 2900, 2901, 29010, 29011, 29012, 29013, 2902, 29020, 29021, 2903, 2904, 29040, 29041, 29042, 29043, 2908, 2909, 294, 2940, 2941, 29410, 29411, 2948, 2949, 3310, 3100, 3101, 3312, 3317, 33182, 33189, 3319, 3330, 797, 3311, 33111, 33119

### **Alcoholism**

291, 2910, 2911, 2912, 2914, 2915, 2918, 29181, 29189, 2919, 30300, 30301, 30302, 30303, 30390, 30391, 30392, 30393, 30500, 30501, 30502, 30503

### **Drug Abuse**

2920, 29282, 29283, 29284, 29289, 2929, 30400, 30401, 30402, 30403, 30410, 30411, 30412, 30413, 30420, 30421, 30422, 30423, 30430, 30431, 30432, 30433, 30440, 30441, 30442, 30443, 30450, 30451, 30452, 30453, 30460, 30461, 30462, 30463, 30470, 30471, 30472, 30473, 30480, 30481, 30482, 30483, 30490, 30491, 30492, 30493, 30520, 30521, 30522, 30523, 30530, 30531, 30532, 30533, 30540, 30541, 30542, 30543, 30550, 30551, 30552, 30553, 30560, 30561, 30562, 30563, 30570, 30571, 30572, 30573, 30580, 30581, 30582, 30583, 30590, 30591, 30592, 30593, 64830, 64831, 64832, 64833, 64834

### **Electrolyte and Fluid Abnormality**

2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2512

### **Past MI**

410, 4100, 41000, 41001, 41002, 4101, 41010, 41011, 41012, 4102, 41020, 41021, 41022, 4103, 41030, 41031, 41032, 4104, 41040, 41041, 41042, 4105, 41050, 41051, 41052, 4106, 41060, 41061, 41062, 4107, 41070, 41071, 41072, 4108, 41080, 41081, 41082, 4109, 41090, 41091, 41092, 412

**APPENDIX C: Definitions of comorbidities (unless otherwise specified, all secondary diagnoses) continued**

**Past Arrhythmia**

427, 4270, 4271, 4272, 4273, 42731, 42732, 4274, 42741, 42742, 4275, 4276, 42760, 42761, 42769, 4278, 42781, 42789

**Unstable Angina**

4111

**Angina**

4130, 4131, 4139

**Hypertension**

4010, 4011, 4019, 402, 4020, 40200, 40201, 4021, 40210, 40211, 4029, 40290, 40291, 403, 4030, 40300, 4031, 40310, 4039, 40390, 404, 4040, 40400, 40401, 4041, 40410, 40411, 4049, 40490, 40491, 405, 4050, 40501, 40509, 4051, 40511, 40519, 4059, 40591, 40599, 64200, 64201, 64202, 64203, 64204, 64210, 64211, 64212, 64213, 64214, 64220, 64221, 64222, 64223, 64224, 64270, 64271, 64272, 64273, 64274, 64290, 64291, 64292, 64293, 64294

**Valvular Disease**

0932, 3940, 3941, 3942, 3949, 3950, 3951, 3952, 3959, 3960, 3961, 3962, 3963, 3968, 3969, 3970, 3971, 3979, 4240, 4241, 4242, 4243, 4249, 7463, 7464, 7465, 7466, V422, V433

**COPD/Chronic Pulmonary Disease**

490, 491, 4910, 4911, 4912, 49120, 49121, 49122, 4918, 4919, 492, 4920, 4928, 4940, 4941, 4950, 4951, 4952, 4953, 4954, 4955, 4956, 4957, 4958, 4959, 496, 500, 501, 502, 503, 504, 505, 5064

**Asthma**

493, 4930, 49300, 49301, 49302, 4931, 49310, 49311, 49312, 4932, 49320, 49321, 49322, 4939, 49390, 49391, 49392

**Liver Disease/Dysfunction**

07022, 07023, 07032, 07033, 07044, 07054, 4560, 4561, 45620, 45621, 570, 571, 5710, 5711, 5712, 5713, 5714, 57140, 57141, 57149, 5715, 5716, 5718, 5719, 572, 5720, 5721, 5722, 5723, 5724, 5728, 573, 5730, 5731, 5732, 5733, 5734, 5738, 5739, V427

**Renal Dysfunction**

581, 5810, 5811, 5812, 5813, 5818, 58181, 58189, 5819, 582, 5820, 5821, 5822, 5824, 5828, 58281, 58289, 5829, 583, 5830, 5831, 5832, 5834, 5836, 5837, 5838, 58381, 58389, 5839, 588, 5880, 5881, 5888, 58881, 58889, 5889

**Renal Failure**

40301, 40311, 40391, 40402, 40403, 40412, 40413, 40492, 40493, 584, 5845, 5846, 5847, 5848, 5849, 585, 586, V420, V451, V560, V561, V562, V563, V5631, V5632, V568

**APPENDIX C: Definitions of comorbidities (unless otherwise specified, all secondary diagnoses) continued**

**Non-Insulin Dependent Diabetes**

2503, 25030, 25032, 2504, 25040, 2505, 25050, 25052, 2506, 25060, 25062, 2507, 25070, 25072, 2508, 25080, 25082, 2509, 25090, 25092, 6480, 25000, 25001, 25002, 25003, 2501, 25010, 25012, 2502, 25020, 25022, 25031, 25033, 25042, 25011, 25021, 25041, 25051, 25061, 25071, 25081, 25091, 25013, 25023, 25043, 25053, 25063, 25073, 25083, 25093, 7751

**Paraplegia**

342, 3420, 34200, 34201, 34202, 3421, 34210, 34211, 34212, 3428, 34280, 34281, 34282, 3429, 34290, 34291, 34292, 3430, 3431, 3432, 3433, 3434, 3438, 3439, 344, 3440, 34400, 34401, 34402, 34403, 34404, 34409, 3441, 3442, 3443, 34430, 34431, 34432, 3444, 34440, 34441, 34442, 3445, 3446, 34460, 34471, 3448, 34481, 34489, 3449, 4382, 43820, 43821, 43822, 4383, 43830, 43831, 43832, 4384, 43840, 43841, 43842, 4385, 43850, 43851, 43852, 43853

**Collagen Vascular Disease**

7010, 7100, 7101, 7102, 7103, 7104, 7105, 7108, 7109, 7140, 7141, 7142, 7143, 71430, 71431, 71432, 71433, 7144, 7148, 71481, 71479, 7149, 7200, 7201, 7202, 7208, 72081, 72089, 7209, 725

**Coagulopathy**

2870, 2871, 2872, 2878, 2879

**Thrombocytopenia**

2873, 2874, 2875

**Hemophilia/Congenital Coagulopathy**

2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2869

**Smoking History**

V1582

**Post Inflammatory Pulmonary Fibrosis**

515

**Cushings Disease (\*)**

2550

**Graves Disease**

2420, 24200, 24201

**Cancer**

140, 1400, 1401, 1403, 1404, 1405, 1406, 1408, 1409, 141, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1418, 1419, 142, 1420, 1421, 1422, 1428, 1429, 143, 1430, 1431, 1438, 1439, 144, 1440,

**APPENDIX C: Definitions of comorbidities (unless otherwise specified, all secondary diagnoses) continued**

1441, 1448, 1449, 145, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1458, 1459, 146, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 147, 1470, 1471, 1472, 1473, 1478, 1479, 148, 1480, 1481, 1482, 1483, 1488, 1489, 149, 1490, 1491, 1498, 1499, 150, 1500, 1501, 1502, 1503, 1504, 1505, 1508, 1509, 151, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1518, 1519, 152, 1520, 1521, 1522, 1523, 1528, 1529, 153, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 154, 1540, 1541, 1542, 1543, 1548, 155, 1550, 1551, 1552, 156, 1560, 1561, 1562, 1568, 1569, 157, 1570, 1571, 1572, 1573, 1574, 1578, 1579, 158, 1580, 1588, 1589, 159, 1590, 1591, 1598, 1599, 160, 1600, 1601, 1602, 1603, 1604, 1605, 1608, 1609, 161, 1610, 1611, 1612, 1613, 1618, 1619, 162, 1620, 1622, 1623, 1624, 1625, 1628, 1629, 163, 1630, 1631, 1638, 1639, 164, 1640, 1641, 1642, 1643, 1648, 1649, 165, 1650, 1658, 1659, 170, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 171, 1710, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 172, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 173, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 174, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1748, 1749, 175, 1750, 1759, 176, 1760, 1761, 1762, 1763, 1764, 1765, 1768, 1769, 179, 180, 1800, 1801, 1808, 1809, 181, 182, 1820, 1821, 1828, 183, 1830, 1832, 1833, 1834, 1835, 1838, 1839, 184, 1840, 1841, 1842, 1843, 1844, 1848, 1849, 185, 186, 1860, 1869, 187, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 188, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 189, 1890, 1891, 1892, 1893, 1894, 1898, 1899, 190, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 191, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 192, 1920, 1921, 1922, 1923, 1928, 1929, 193, 194, 1940, 1941, 1943, 1944, 1945, 1946, 1948, 1949, 195, 1950, 1951, 1952, 1953, 1954, 1955, 1958, 196, 1960, 1961, 1962, 1963, 1965, 1966, 1968, 1969, 197, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 198, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 19881, 19882, 19889, 199, 1990, 1991, 200, 2000, 20000, 20001, 20002, 20003, 20004, 20005, 20006, 20007, 20008, 2001, 20010, 20011, 20012, 20013, 20014, 20015, 20016, 20017, 20018, 2002, 20020, 20021, 20022, 20023, 20024, 20025, 20026, 20027, 20028, 2008, 20080, 20081, 20082, 20083, 20084, 20085, 20086, 20087, 20088, 201, 2010, 20100, 20101, 20102, 20103, 20104, 20105, 20106, 20107, 20108, 2011, 20110, 20111, 20112, 20113, 20114, 20115, 20116, 20117, 20118, 2012, 20120, 20121, 20122, 20123, 20124, 20125, 20126, 20127, 20128, 2014, 20140, 20141, 20142, 20143, 20144, 20145, 20146, 20147, 20148, 2015, 20150, 20151, 20152, 20153, 20154, 20155, 20156, 20157, 20158, 2016, 20160, 20161, 20162, 20163, 20164, 20165, 20166, 20167, 20168, 2017, 20170, 20171, 20172, 20173, 20174, 20175, 20176, 20177, 20178, 2019, 20190, 20191, 20192, 20193, 20194, 20195, 20196, 20197, 20198, 202, 2020, 20200, 20201, 20202, 20203, 20204, 20205, 20206, 20207, 20208, 2021, 20210, 20211, 20212, 20213, 20214, 20215, 20216, 20217, 20218, 2022, 20220, 20221, 20222, 20223, 20224, 20225, 20226, 20227, 20228, 2023, 20230, 20231, 20232, 20233, 20234, 20235, 20236, 20237, 20238, 2024, 20240, 20241, 20242, 20243, 20244, 20245, 20246, 20247, 20248, 2025, 20250, 20251, 20252, 20253, 20254, 20255, 20256, 20257, 20258, 2026, 20260, 20261, 20262, 20263, 20264, 20265, 20266, 20267, 20268, 2028, 20280, 20281, 20282, 20283, 20284, 20285, 20286, 20287, 20288, 2029, 20290, 20291, 20292, 20293, 20294, 20295, 20296, 20297, 20298, 203, 2030, 20300, 20301, 2031, 20310, 20311, 2038, 20380, 20381, 204,

2040, 20400, 20401, 2041, 20410, 20411, 2042, 20420, 20421, 2048, 20480, 20481, 2049, 20490, 20491, 205, 2050, 20500, 20501, 2051, 20510, 20511, 2052, 20520, 20521, 2053, 20530, **APPENDIX C: Definitions of comorbidities (unless otherwise specified, all diagnoses) continued**

20531, 2058, 20580, 20581, 2059, 20590, 20591, 206, 2060, 20600, 20601, 2061, 20610, 20611, 2062, 20620, 20621, 2068, 20680, 20681, 2069, 20690, 20691, 207, 2070, 20700, 20701, 2071, 20710, 20711, 2072, 20720, 20721, 2078, 20780, 20781, 208, 2080, 20800, 20801, 2081, 20810, 20811, 2082, 20820, 20821, 2088, 20880, 20881, 2089, 2386, 2733, V10, V100, V1000, V1001, V1002, V1003, V1004, V1005, V1006, V1007, V1009, V101, V1011, V1012, V102, V1020, V1021, V1022, V1029, V103, V104, V1040, V1041, V1042, V1043, V1044, V1045, V1046, V1047, V1048, V1049, V105, V1050, V1051, V1052, V1053, V1059, V106, V1060, V1061, V1062, V1063, V1069, V107, V1071, V1072, V1079, V108, V1081, V1082, V1083, V1084, V1085, V1086, V1087, V1088, V1089, V109

#### **Specific Abdominal Cancer**

155, 1550, 1551, 1552, 156, 1560, 1561, 1562, 1568, 1569, 157, 1570, 1571, 1572, 1573, 1574, 1578, 1579, 158, 1580, 1588, 1589, 159, 1590, 1591, 1598, 1599

#### **Hypothyroidism**

243, 2440, 2441, 2442, 2448, 2449

#### **Chronic Peptic Ulcer Disease**

53141, 53151, 53161, 53170, 53171, 53191, 53141, 53151, 53161, 53170, 53171, 53191

#### **HIV and AIDS (\*)**

042

#### **Weight Loss**

260, 261, 262, 263, 2630, 2631, 2632, 2638, 2639, 78321, 78322, 2690, 2691, 2692, 2693, 2698, 2699

#### **Sickle Cell Anemia (\*)**

2826, 28260, 28261, 28262, 28263, 28264, 28268, 28269

(\*) These comorbidities have been too rare in the Medicare population, but they should be considered for inclusion in any given data set.