Name of measure: Failure to Rescue In-Hospital Mortality

MEASURE SPECIFICATIONS (last updated August 2015)	
NAME OF MEASURE	Failure to Rescue In-Hospital Mortality
NUMERATOR/DENOMINATOR	Numerator: patients who died with a complication + patients who died without documented complications. Death is defined as death in the hospital. Denominator: General Surgery, Orthopedic and Vascular patients with complications + patients who died in the hospital without documented complications.
INCLUSIONS/EXCLUSIONS	Inclusions: Adult patients admitted for one of the procedures in the General Surgery, Orthopedic or Vascular DRGs (see Appendix A). Exclusions: Patients over age 90, under age 18.
DATA SOURCES	Patients' linked hospitalization 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 measurement.
DATA ELEMENT DEFINITION AND ALLOWABLE VALUES	Death is defined as in-hospital death. 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.[†] ICD10 codes are provided in Appendix D. Comorbidities are defined in Appendix C using secondary ICD9 diagnosis codes of the current admission and primary or secondary ICD9 diagnosis and procedure codes of previous admissions or encounters within 90 days of the admission date of the current admission.[†] ICD10 codes are provided in Appendix E.
DATA ANALYSIS LOGIC AND METHOD	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 : $$P(d) = P(d|c)*P(c) + P(d|no\ c)*P(no\ c)$$

[†] When Current Procedural Terminology (CPT) codes are available, the definition of complications and comorbidities are augmented to include CPT codes.

	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. 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 deaths with undocumented complications is low, and the recoding of failures needed to include these undocumented complications is minimal.
RISK-ADJUSTMENT METHOD AND ASSOCIATED DATA ELEMENTS	Risk Adjustment: Model was developed using logistic regression analysis.[1, 2] Associated data elements: age in years, sex, race, comorbidities, DRGs (combined with and without complications) and procedure codes within DRGs,[‡] transfer status.
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.[3-8] Numerous researchers have studied the measure across varied clinical domains.[9-32]
DESCRIBE RELIABILITY TESTS AND RELEVANT CITATIONS	Split half sample reliability had a correlation of 0.39, similar to in-hospital mortality (0.36).

[‡] Detailed list of DRGs and ICD9 procedure codes available from the investigator upon request.

DESCRIBE VALIDITY TESTS AND RELEVANT CITATIONS	a) Marginal and partial coefficients in logit models using detailed patient characteristics and hospital characteristics shown to be associated with better outcomes in previous studies.[2, 7] 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. The following hospital characteristics have been shown to be 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 200/250 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)).[2-8] b) The relative contribution of patient-to-hospital characteristics that predicted each outcome of interest, as provided by the omega statistic.[2, 33] The omega statistic computes a ratio of the squared sum of the log odds for model patent 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.
METHODOLOGY FOR UPDATING MEASURES	Periodic review of DRG codes, ICD9/ICD10 diagnosis codes, ICD9/ICD10 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 documented complication.

Note 2: 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 or died without a documented 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.

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APPENDICES

Appendix A: List of DRGs
Appendix B: List of Complications and their definitions (ICD-9)
Appendix C: List of Comorbidities and their definitions (ICD-9)
Appendix D: List of Complications and their definitions (ICD-10)
Appendix E: List of Comorbidities and their definitions (ICD-10)

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
326   Stomach, esophageal & duodenal proc w MCC
327   Stomach, esophageal & duodenal proc w CC
328   Stomach, esophageal & duodenal proc w/o CC/MCC
329   Major small & large bowel procedures w MCC
330   Major small & large bowel procedures w CC
331   Major small & large bowel procedures w/o CC/MCC
332   Rectal resection w MCC
333   Rectal resection w CC
334   Rectal resection w/o CC/MCC
335   Peritoneal adhesiolysis w MCC
336   Peritoneal adhesiolysis w CC
337   Peritoneal adhesiolysis w/o CC/MCC
338   Appendectomy w complicated principal diag w MCC
339   Appendectomy w complicated principal diag w CC
340   Appendectomy w complicated principal diag w/o CC/MCC
341   Appendectomy w/o complicated principal diag w MCC
342   Appendectomy w/o complicated principal diag w CC
343   Appendectomy w/o complicated principal diag w/o CC/MCC
344   Minor small & large bowel procedures w MCC
345   Minor small & large bowel procedures w CC
346   Minor small & large bowel procedures w/o CC/MCC
347   Anal & stomal procedures w MCC
348   Anal & stomal procedures w CC
349   Anal & stomal procedures w/o CC/MCC
350   Inguinal & femoral hernia procedures w MCC
351   Inguinal & femoral hernia procedures w CC
352   Inguinal & femoral hernia procedures w/o CC/MCC
353   Hernia procedures except inguinal & femoral w MCC
354   Hernia procedures except inguinal & femoral w CC
355   Hernia procedures except inguinal & femoral w/o CC/MCC
356   Other digestive system O.R. procedures w MCC
357   Other digestive system O.R. procedures w CC
358   Other digestive system O.R. procedures w/o CC/MCC

MDC 7 – Hepatobiliary
405   Pancreas, liver & shunt procedures w MCC
406   Pancreas, liver & shunt procedures w CC
407   Pancreas, liver & shunt procedures w/o CC/MCC
408   Biliary tract proc except only cholecyst w or w/o CDE w MCC
409   Biliary tract proc except only cholecyst w or w/o CDE w CC
410   Biliary tract proc except only cholecyst w or w/o CDE w/o CC/MCC
411   Cholecystectomy w CDE w MCC

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412   Cholecystectomy w CDE w CC
413   Cholecystectomy w CDE w/o CC/MCC
414   Cholecystectomy except by laparoscope w/o CDE w MCC
415   Cholecystectomy except by laparoscope w/o CDE w CC
416   Cholecystectomy except by laparoscope w/o CDE w/o CC/MCC
417   Laparoscopic cholecystectomy w/o CDE w MCC
418   Laparoscopic cholecystectomy w/o CDE w CC
419   Laparoscopic cholecystectomy w/o CDE w/o CC/MCC
420   Hepatobiliary diagnostic procedures w MCC
421   Hepatobiliary diagnostic procedures w CC
422   Hepatobiliary diagnostic procedures w/o CC/MCC
423   Other Hepatobiliary or pancreas O.R. procedures w MCC
424   Other Hepatobiliary or pancreas O.R. procedures w CC
425   Other Hepatobiliary or pancreas O.R. procedures w/o MCC/CC

MDC 9 – Skin, subcutaneous tissue, breast
573   Skin graft &/or debrid for skin ulcer or cellulitis w MCC
574   Skin graft &/or debrid for skin ulcer or cellulitis w CC
575   Skin graft &/or debrid for skin ulcer or cellulitis w/o MCC/CC
576   Skin graft &/or debrid except for skin ulcer or cellulitis w MCC
577   Skin graft &/or debrid except for skin ulcer or cellulitis w CC
578   Skin graft &/or debrid except for skin ulcer or cellulitis w/o MCC/CC
579   Other skin, subcutaneous tissue & breast plastic procedures w MCC
580   Other skin, subcutaneous tissue & breast plastic procedures w CC
581   Other skin, subcutaneous tissue & breast plastic procedures w/o MCC/CC
582   Mastectomy for malignancy w CC/MCC
583   Mastectomy for malignancy w/o CC/MCC
584   Breast biopsy, local excision & other breast procedures w CC/MCC
585   Breast biopsy, local excision & other breast procedures w/o CC/MCC

MDC 10 – Endocrine, nutritional, metabolic
614   Adrenal & pituitary procedures w CC/MCC
615   Adrenal & pituitary procedures w/o CC/MCC
619   O.R. procedures for obesity w MCC
620   O.R. procedures for obesity w CC
621   O.R. procedures for obesity w/o CC/MCC
622   Skin grafts & wound debrid for endoc, nutrit & metab dis w MCC
623   Skin grafts & wound debrid for endoc, nutrit & metab dis w CC
624   Skin grafts & wound debrid for endoc, nutrit & metab dis w/o CC/MCC
625   Thyroid, parathyroid & thyroglossal procedures w MCC
626   Thyroid, parathyroid & thyroglossal procedures w CC
627   Thyroid, parathyroid & thyroglossal procedures w/o CC/MCC
628   Other endocrine, nutrit & metab O.R. proc w MCC
629   Other endocrine, nutrit & metab O.R. proc w CC
630   Other endocrine, nutrit & metab O.R. proc w/o CC/MCC

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Orthopedic DRGs

MDC 8 – Musculoskeletal and connective tissue

453	Combined anterior/posterior spinal fusion w MCC
454	Combined anterior/posterior spinal fusion w CC
455	Combined anterior/posterior spinal fusion w/o CC/MCC
456	Spinal fus exc cerv w spinal curv/malig/infec or 9+ fus w MCC
457	Spinal fus exc cerv w spinal curv/malig/infec or 9+ fus w CC
459	Spinal fusion except cervical w MCC
458	Spinal fus exc cerv w spinal curv/malig/infec or 9+ fus w/o CC/MCC
460	Spinal fusion except cervical w/o MCC
461	Bilateral or multiple major joint procs of lower extremity w MCC
462	Bilateral or multiple major joint procs of lower extremity w/o MCC
463	Wnd debrid & skn grft exc hand, for musculo-conn tiss dis w MCC
464	Wnd debrid & skn grft exc hand, for musculo-conn tiss dis w CC
465	Wnd debrid & skn grft exc hand, for musculo-conn tiss dis w/o CC/MCC
466	Revision of hip or knee replacement w MCC
467	Revision of hip or knee replacement w CC
468	Revision of hip or knee replacement w/o CC/MCC
469	Major joint replacement or reattachment of lower extremity w MCC
470	Major joint replacement or reattachment of lower extremity w/o MCC
471	Cervical spinal fusion w MCC
472	Cervical spinal fusion w CC
473	Cervical spinal fusion w/o CC/MCC
474	Amputation for musculoskeletal sys & conn tissue dis w MCC
475	Amputation for musculoskeletal sys & conn tissue dis w CC
476	Amputation for musculoskeletal sys & conn tissue dis w/o CC/MCC
477	Biopsies of musculoskeletal system & connective tissue w MCC
478	Biopsies of musculoskeletal system & connective tissue w CC
479	Biopsies of musculoskeletal system & connective tissue w/o CC/MCC
480	Hip & femur procedures except major joint w MCC
481	Hip & femur procedures except major joint w CC
482	Hip & femur procedures except major joint w/o CC/MCC
483	Major joint & limb reattachment proc of upper extremity w CC/MCC
484	Major joint & limb reattachment proc of upper extremity w/o CC/MCC
485	Knee procedures w pdx of infection w MCC
486	Knee procedures w pdx of infection w CC
487	Knee procedures w pdx of infection w/o CC/MCC
488	Knee procedures w/o pdx of infection w CC/MCC
489	Knee procedures w/o pdx of infection w/o CC/MCC
490	Back & neck proc exc spinal fusion w CC/MCC or disc device/neurostim
491	Back & neck proc exc spinal fusion w/o CC/MCC
492	Lower extrem & humer proc except hip, foot, femur w MCC
493	Lower extrem & humer proc except hip, foot, femur w CC
494	Lower extrem & humer proc except hip, foot, femur w/o CC/MCC
495	Local excision & removal int fix devices exc hip & femur w MCC

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496	Local excision & removal int fix devices exc hip & femur w CC
497	Local excision & removal int fix devices exc hip & femur w/o CC/MCC
498	Local excision & removal int fix devices of hip & femur w CC/MCC
499	Local excision & removal int fix devices of hip & femur w/o CC/MCC
500	Soft tissue procedures w MCC
501	Soft tissue procedures w CC
502	Soft tissue procedures w/o CC/MCC
503	Foot procedures w MCC
504	Foot procedures w CC
505	Foot procedures w/o CC/MCC
506	Major thumb or joint procedures
507	Major shoulder or elbow joint procedures w CC/MCC
508	Major shoulder or elbow joint procedures w/o CC/MCC
509	Arthroscopy
510	Shoulder, elbow or forearm proc, exc major joint proc w MCC
511	Shoulder, elbow or forearm proc, exc major joint proc w CC
512	Shoulder, elbow or forearm proc, exc major joint proc w/o CC/MCC
513	Hand or wrist proc, except major thumb or joint proc w CC/MCC
514	Hand or wrist proc, except major thumb or joint proc w/o CC/MCC
515	Other musculoskelet sys & conn tiss O.R. proc w MCC
516	Other musculoskelet sys & conn tiss O.R. proc w CC
517	Other musculoskelet sys & conn tiss O.R. proc w/o CC/MCC

Vascular Surgery DRGs

MDC 5 – Circulatory system

237	Major cardiovasc procedures w MCC or thoracic aortic aneurysm repair
238	Major cardiovasc procedures w/o MCC
239	Amputation for circ sys disorders exc upper limb & toe w MCC
240	Amputation for circ sys disorders exc upper limb & toe w CC
241	Amputation for circ sys disorders exc upper limb & toe w/o CC/MCC
246	Perc cardiovasc proc w drug-eluting stent w MCC or 4+ vessels/stents
247	Perc cardiovasc proc w drug-eluting stent w/o MCC
248	Perc cardiovasc proc w non-drug-eluting stent w MCC or 4+ ves/stents
249	Perc cardiovasc proc w non-drug-eluting stent w/o MCC
250	Perc cardiovasc proc w/o coronary artery stent w MCC
251	Perc cardiovasc proc w/o coronary artery stent w/o MCC
255	Upper limb & toe amputation for circ system disorders w MCC
256	Upper limb & toe amputation for circ system disorders w CC
257	Upper limb & toe amputation for circ system disorders w/o CC/MCC
263	Vein ligation & stripping
264	Other circulatory system O.R. procedures

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) (ICD-9)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
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[a]	**Secondary diagnosis codes:** 41189, 99601 or (9971 and any of (42612, 42613, 42682, 42689, 42731, 42781, 42789, 7943, 79431) **Secondary procedure codes:** 3606, 3607, 3609, 3778, 3780, 3781, 3782, 3783 **CPT procedure codes**: 33206, 33207, 33208, 33210, 33211, 33212, 33213, 33214, 33216, 33217, 33240, 33249, 92953	
2. Cardiac Emergency[a]	**Secondary diagnosis codes:** 4100, 41001, 4101, 41011, 4102, 41021, 4103, 41031, 4104, 41041, 4105, 41051, 4106, 41061, 4107, 41071, 4108, 41081, 4109, 41091, 4271, 42741, 4275, 7855, 78550, 78551 **Secondary procedure codes:** (3761, 3791, 996, 9960, 9961, 9962, 9963, 9964, 9969 and exclusion) **CPT procedure codes:** (92950, 92960, 92970, 9297192997, 92998 and exclusion)	**Principal diagnosis codes:** 4275, 7855, 78550, 78551, 78559, 7991 **Principal procedure codes:** 9393, 996, 9963
3. CHF	**Secondary diagnosis codes:** 42821, 42823, 42831, 42833, 42841, 42843, 5184, or (9971 and any of (428, 4280, 4281, 42820, 42830, 42840, 4289)) or (428, 4280, 4281, 42820, 42830, 42840, 4289, and exclusion)	History of CHF defined as any of the following diagnoses during a look back period‡: 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

† When ICD or CPT procedure codes are used to define a complication then there will be either a superscript (a) that indicates the complication occurring if secondary or CPT procedure code is equal to or later than the date of surgery or a superscript (b) that indicates the complication occurring if secondary or CPT procedure code is later than the day of surgery

‡ Depending on the study, the look back period may differ between 90 or 180 days

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(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-9)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
4. Hypotension/Shock/ Hypovolemia	**Secondary diagnosis codes:** 2765, 27650, 27651, 27652, 4589, 78550, 78551, 78552, 78559, 7963, 9950, 9954, 99800, 99801, 99802, 99809	
5. Pulmonary embolus[a]	**Secondary diagnosis codes:** 4151, 41511, 41512, 41513, 4539, 9581 **(CPT procedure codes:** 75741, 75743, 78579, 78580, 78582, 78599 with Secondary procedure code: 387) OR CPT procedure codes: 75894, 75896	
6. Deep Vein Thrombosis[b]	**Secondary diagnosis codes:** 4534, 45340, 45341, 45342, 45350, 45351, 45352, 4536, 45371, 45372, 45373, 45374, 45375, 45376, 45377, 45379, 4538, 45381, 45382, 45383, 45384, 45385, 45386, 45387, 45389 **Secondary procedure codes:** 387	
7. Phlebitis[b]	**Secondary diagnosis codes:** 4510, 4511, 45111, 45119, 4512, 4518, 45181, 45182, 45184, 45189, 4519	
8. Cerebrovascular Accident (CVA)/Stroke[a]	**Secondary diagnosis codes:** (431, 432, 43301, 43311, 43321, 43331, 43381, 43391, 434, 4340, 43401, 4341, 43411, 4349, 43491, 436, 99702 and exclusion)	History of CVA/stroke defined as any of the following diagnoses during a look back period: 431, 432, 43301, 43311, 43321, 43331, 43381, 43391, 434, 4340, 43401, 4341, 43411, 4349, 43491, 436, 438, 4380, 4381, 43810, 43811, 43812, 43813, 43814, 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, 99702, V1253, V1254, V1259
9. Transient Ischemic Attack (TIA)	**Secondary diagnosis codes:** 4350, 4351, 4352, 4353, 4358, 4359	
10. Coma	**Secondary diagnosis codes:** 3481, 5722, 7800, 78001, 78009	
11. Seizure[b]	**Secondary diagnosis codes:** (7803, 78031, 78033, 78039 and exclusion)	History of seizure defined as any of the following diagnoses during a look back period: 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

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) (ICD-9)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
12. Psychosis	**Secondary diagnosis codes:** 292, 2920, 2921, 29211, 29212, 2922, 2928, 29281, 29282, 29283, 29284, 29285, 29289, 2929, 2930, 2939, 29420, 29421, 2948, 2949	
13. Nervous System Complications[a]	**Secondary diagnosis codes:** 9970, 99700, 99701, 99709 **Secondary procedure codes:** 0331, 8914, 8919	
14. Pneumonia-Aspiration	**Secondary diagnosis codes:** 5070, 5071, 5078 or (9973, 99731, 99732, 99739 and any of 4829, 485, or 486)	
15. Pneumonia, other	**Secondary diagnosis codes:** 481, 4820, 4821, 4822, 4823, 48230, 48231, 48232, 48239, 4824, 48240, 48241, 48242, 48249, 4828, 48281, 48282, 48283, 48284, 48289, 4829, 485, 486 or (514, 9973, 99731, 99732, 99739 and exclusion)	**DRG** DRG=475(2004-2006)75-102(2004-2007) 565, 566 (2007) 163-208 (2008-2009) **Any diagnosis codes:** *1) Viral Pneumonia/SARS* 4800, 4801, 4802, 4803, 4808, 4809, 483, 4830, 4831, 4838, 4841, 4843, 4845, 4846, 4847, 4848, 4870, 4871, 4878, 48801, 48811, 48881 *2) Immunocompromised State* 042, 1363, 27900, 27901, 27902, 27903, 27904, 27905, 27906, 27909, 27910, 27911, 27912, 27913, 27919, 2792, 2793, 2794, 27941, 27949, 2798, 2799
16. Pneumothorax/Effusion[b]	**Secondary diagnosis codes:** 5120 or (512, 5121, 5122, 5128, 51281, 51282, 51283, 51284, 51289, 5180 and exclusion) **Secondary procedure codes:** (3404, 3406, 3491 and exclusion)	In the OBSOS Thoracotomy Procedure Category
17. Respiratory Compromise[b]	DRG = 483(2002- Sept 2004) 541, 542 (Oct 2004-2009) **Secondary diagnosis codes:** 5185, 51851, 51852, 51853, 51881, 51889, 7991 **Secondary procedure codes:** 311, 312, 3121, 3129, 9604, 9672 **CPT procedure codes:** 31500, 31603, 31605, 31610	
18. Bronchospasm	**Secondary diagnosis codes:** 5191, 51911	

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) (ICD-9)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
19. Internal Organ Damage[b]	**Secondary diagnosis codes:** 34931, 34939, 9981, 99811, 99812, 99813, 9982 **Secondary procedure codes:** (3941, 5412, 5419 and exclusion) **CPT procedure codes:** (35800, 35820, 35840, 35860 and exclusion)	
20. Perforation	**Secondary diagnosis codes:** 34931, 34939, 5304, 56983, 9982	
21. Peritonitis[b]	**Secondary diagnosis codes:** 5670, 5671, 5672, 56721, 56722, 56723, 56729, 5673, 56738, 56739, 5678, 5679, 5695, 7894 **Secondary procedure codes:** (5491 and exclusion)	Comorbidity of liver disease/dysfunction defined in Appendix C, as diagnosis in the index admission or in the look back period
22. GI Bleed and Blood Loss[b]	**Secondary diagnosis codes:** [2851 or (5780, 5781, 5789 and principal procedure exclusion), or (5307 and DRG exclusion 1) or any of (4560, 45620, 53082, 53100, 53101, 53120, 53121, 53130, 53131, 53190, 53191, 53200, 53201, 53210, 53211, 53220, 53221, 53230, 53231, 53290, 53291, 53300, 53301, 53310, 53311, 53320, 53321, 53330, 53331, 53390, 53391, 53400, 53401, 53410, 53411, 53420, 53421, 53430, 53431, 53490, 53491, 53501, 53511, 53540, 53541, 53551, 53561, 53570, 53571, 53784, 56212, 56213, 5693, 56985, 5789 and DRG exclusion 2)] and exclusion of Trauma defined by DRG or by principal diagnosis or History of alcoholism **CPT procedure codes:** (43227, 43255, 44366, 44391, 45317, 45334, 75726 and principal procedure exclusion)	Trauma defined by DRG or principal diagnosis or History of alcoholism *Trauma as defined by principal diagnoses(**include all fourth and fifth digit sub-classifications for the following codes**)* 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, 834, 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 *Trauma DRGs* 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(2004-2007) 027, 082, 083, 084, 085, 086, 087, 088, 089, 090, 154, 155, 156, 183, 184, 185, 483, 484, 533, 534, 535, 536, 537, 538, 901, 902, 903, 906, 907, 908, 909, 913, 914, 927, 928, 929, 933, 934, 935, 955, 956, 957, 958, 959, 963, 964, 965(2008-2009) *History of alcoholism in look back period defined as secondary diagnosis* 2910, 2911, 2912, 2913, 2914, 2915, 29181, 29182, 29189, 2919, 30300, 30301, 30302, 30303, 30390, 30391, 30392, 30500, 30501, 30502, 30503

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) (ICD-9)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
		Principal procedure codes: 444, 4440, 4441, 4442 if secondary diagnosis 5780, 5781, 5789 **DRG** 1) *DRG* = 146-171(2004-2007) 332-358(2008-2009) if secondary diagnosis = 5307 2) *DRG* = 146-167, 170-184, 188-208(2004-2007) 326-358, 374-395, 405-446(2008-2009) if any of the secondary diagnoses in the inclusion are in the set of diagnoses 4560-5789
23. Sepsis	**Secondary diagnosis codes:** 0380, 0381, 03810, 03811, 03812, 03819, 0382, 0383, 0384, 03840, 03841, 03842, 03843, 03844, 03849, 0388, 0389, 449, 78552, 7907	
24. Deep Wound Infection/ Wound Complication[b]	**Secondary diagnosis codes:** 9983, 99830, 99831, 99832, 99833, 9985, 99859, 9986, 99883 **Secondary procedure codes:** (5461, 8604, 8622, 8659, 8670, 8674 and exclusion) **CPT procedure codes:** (10180, 11040, 11041, 11042, 11043, 11044, 11045, 11046, 11047 and exclusion)	Any diagnosis code of Decubitus Ulcer: 7070, 70700, 70701, 70702, 70703, 70704, 70705, 70706, 70707, 70709, 70720, 70721, 70722, 70723, 70724, 70725
25. Renal Dysfunction[b]	**Secondary diagnosis codes:** (5845, 5846, 5847, 5848, 5849, 7885, 7925, 99668, 99673, V451, V4511, V56, V560, V561, V562, V563, V5631, V5632, V568, E8702, E8712, E8722, E8742, E8791) and exclusion **Secondary procedure codes:** (3895, 3927, 3943, 5494, 5498 and exclusion) **CPT procedure codes** (90935, 90937, 90945, 90947, 90970, 90997, 90999, 4054F, 4055F and exclusion)	Evidence of dialysis during look back period Principal or secondary procedure codes: 3895, 3927, 3942, 3943, 3995, 5494, 5498 Diagnosis/Status codes: 7925, 99668, 99673, V451, V4511, V56, V560, V561, V562, V563, V5631, V5632, V568, E8702, E8712, E8722, E8742, E8791 If Part B Medicare files are available use CPT codes: 36833, 90935, 90937, 90940, 90945, 90947, 90966, 90970, 90989, 90999, 99512, 99601, 4051F, 4052F, 4053F, 4054F, 4055F
26. Gangrene/Amputation[b]	**Secondary diagnosis codes:** 72886, 7854 **Secondary procedure codes:** (840, 8400, 8401, 8402, 8403, 8404, 8405, 8406, 8407, 8408, 8409, 841, 8410, 8411,	**Principal procedure codes**: 840, 8400, 8401, 8402, 8403, 8404, 8405, 8406, 8407, 8408, 8409, 841, 8410, 8411, 8412, 8413, 8414, 8415, 8416, 8417, 8418, 8419

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	8412, 8413, 8414, 8415, 8416, 8417, 8418, 8419 and exclusion) **CPT procedure codes:** (23900, 23920, 24900, 24920, 24930, 24931, 24940, 25900, 25905, 25909, 25920, 25924, 25927, 25931, 26910, 26951, 26952, 27290, 27295, 27590, 27591, 27592, 27596, 27598, 27880, 27881, 27882, 27886, 27888, 27889, 28800, 28805, 28810, 28820, 28825, and exclusion)	
27. Intestinal Obstruction	**Secondary diagnosis codes:** (5570, 56081, 5609, 9974, 99741, 99749 and exclusion)	**DRG** DRG = 148-153(2004-2007) 329-331, 335-337, 344-346(2008-2009) **Principal diagnosis codes:** 5570, 56081, 5609
28. Return to Surgery[a]	**Secondary diagnosis codes:** 9984, 9987 **Secondary procedure codes:** 3403, 3409, 5411, 5412, 5492 **CPT procedure codes:** 32110, 32120, 32150, 49002	
29. Decubitus Ulcer[b]	**Secondary diagnosis codes:** 7070, 70700, 70701, 70702, 70703, 70704, 70705, 70706, 70707, 70709, 70720, 70721, 70722, 70723, 70724, 70725	
30. Orthopedic Complication[b]	**Secondary diagnosis codes:** (9964, 99640, 99641, 99642, 99643, 99644, 99645, 99646, 99647, 99649, 99666, 9967, 99677, 99678 and exclusion) **Secondary procedure codes:** 7971, 7975, 7976, or (7860, 7869 and exclusion)	**Principal procedure codes:** 0070, 0071, 0072, 0073, 0074, 0075, 0076, 0077, 0080, 0081, 0082, 0083, 0084, 8153, 8155, 8159, 8183, 8185
31. Compartment Syndrome[b]	**(Secondary diagnosis codes:** 9588, 99889 with **Secondary procedure code:** 8314) OR **CPT procedure codes:** 27025, 27305, 27496, 27497, 27498, 27499, 27600, 27601, 27602, 27892, 27893, 27894, 28008, 29893	
32. Hepatitis/Jaundice	**Secondary diagnosis codes:** 570, 5733	
33. Pancreatitis	**Secondary diagnosis codes:** 5770	
34. Necrosis of the Bone-Thermal or Aseptic	**Secondary diagnosis codes:**	

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) (ICD-9)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	73340, 73341, 73342, 73343, 73344, 73345, 73349	
35. Osteomyelitis[b]	**Secondary diagnosis codes:** (7300, 73000, 73001, 73002, 73003, 73004, 73005, 73006, 73007, 73008, 73009, 7302, 73020, 73021, 73022, 73023, 73024, 73025, 73026, 73027, 73028, 73029, 99667 and exclusion) **CPT procedure codes:** 23035, 23170, 23172, 23174, 23180, 23182, 23184, 24134, 24136, 24138, 24140, 24145, 24147, 26992, 27070, 27071, 27303, 27360, 27607, 27640, 27641, 28005, 28120, 28122, 28124	**Primary diagnosis codes:** 7300, 73000, 73001, 73002, 73003, 73004, 73005, 73006, 73007, 73008, 73009, 7302, 73020, 73021, 73022, 73023, 73024, 73025, 73026, 73027, 73028, 73029, 99667
36. Disseminated Intravascular Coagulopathy (DIC)	**Secondary diagnosis codes:** 2866	
37. Pyelonephritis	**Secondary diagnosis codes:** 5901, 59010, 59011, 5902, 5903, 5908, 59080, 59081, 5909	
38. Post-Surgical Complication	**Secondary diagnosis codes:** 99700, 99701, 9972, 9975, 99851, 99852, 9988, 99881, 99882, 99889, 9989, 9990, 9991, 9992, 9993, 99931, 99932, 99933, 99934, 99939, 9994, 99941, 99942, 99949, 9995, 99951, 99952, 99959, 9996, 99960, 99961, 99962, 99963, 99969, 9997, 99970, 99971, 99972, 99973, 99974, 99975, 99976, 99977, 99978, 99979, 9998, 99980, 99981, 99982, 99983, 99984, 99985, 99988, 99989, 9999	

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

Heart Failure
Look-back Period
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

Current Admission
428, 4280, 4281, 42820, 42821, 42830, 42831, 4289, 5184 (only if secondary ICD-9 code does not equal 9971)
42822, 42823, 42832, 42833, 42842, 42843

Stroke
Look-back Period
431, 432, 43301, 43311, 43321, 43331, 43381, 43391, 434, 4340, 43401, 4341, 43411, 4349, 43491, 436, 99702, 438, 4380, 4381, 43810, 43811, 43812, 43813, 43814, 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, V1253, V1254, V1259

Current Admission
438, 4380, 43810, 43811, 43812, 43813, 43814, 43819, 43820, 43821, 43822, 43830, 43831, 43832, 43840, 43841, 43842, 43850, 43851, 43852, 43853, 4388, 43881, 43882, 43889, 4389, V1253, V1254, V1259

Seizures
Look-back Period
345, 3450, 34500, 34501, 3451, 34510, 34511, 3452, 3453, 3454, 34540, 34541, 3455, 34550, 34551, 3457, 34570, 34571, 3458, 34580, 34581, 3459, 34590, 34591, 7803

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

Dementias
Look-back Period or Current Admission
290, 2900, 2901, 29010, 29011, 29012, 29013, 2902, 29020, 29021, 2903, 2904, 29040, 29041, 29042, 29043, 2908, 2909, 294, 2940, 2941, 29410, 29411, 29420, 29421, 2948, 2949, 3100, 3101, 3310, 3311, 33111, 33119, 3312, 3316, 3317, 33182, 33189, 3319, 3330, 797

Alcoholism
Look-back Period or Current Admission
291, 2910, 2911, 2912, 2914, 2915, 2918, 29181, 29182, 29189, 2919, 30300, 30301, 30302, 30303, 30390, 30391, 30392, 30393, 30500, 30501, 30502, 30503

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

Drug Abuse

Look-back Period or Current Admission

2920, 29282, 29283, 29284, 29285, 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

Past MI

Look-back Period

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

Current Admission

41002, 41012, 41022, 41032, 41042, 41052, 41062, 41072, 41082, 41092, 412

Past Arrhythmia

Look-back Period

427, 4270, 4271, 4272, 4273, 42731, 42732, 4274, 42741, 42742, 4275, 4276, 42760, 42761, 42769, 4278, 42781, 42789, 4279

Current Admission

4273, 42781, 42789 (only if secondary ICD-9 procedure code does NOT equal 9971)

Unstable Angina

Look-back Period or Current Admission

4111

Angina

Look-back Period or Current Admission

4130, 4131, 4139

Hypertension

Look-back Period or Current Admission

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

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

Valvular Disease
Look-back Period or Current Admission
0932, 09320, 09321, 09322, 09323, 09324, 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
Look-back Period or Current Admission
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
Look-back Period or Current Admission
493, 4930, 49300, 49301, 49302, 4931, 49310, 49311, 49312, 4932, 49320, 49321, 49322, 4939, 49390, 49391, 49392

Liver Disease/Dysfunction
Look-back Period or Current Admission
07022, 07023, 07032, 07033, 07044, 07054, 4560, 4561, 45620, 45621, 570, 571, 5710, 5711, 5712, 5713, 5714, 57140, 57141, 57142, 57149, 5715, 5716, 5718, 5719, 572, 5720, 5721, 5722, 5723, 5724, 5728, 573, 5730, 5731, 5732, 5733, 5734, 5735, 5738, 5739, V427

Renal Dysfunction
Look-back Period
40300, 40310, 40390, 40400, 40401, 40410, 40411, 40490, 40491, 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, 585, 5851, 5852, 5853, 5854, 5859, 588, 5880, 5881, 5888, 58881, 58889, 5889

Current Admission
584, 5845, 5846, 5847, 5848, 5849

Renal Failure
Look-back Period
40301, 40311, 40391, 40402, 40403, 40412, 40413, 40492, 40493, 5855, 5856, 586, 7925, 99673, 99676, 9968, V420, V451, V4511, V56, V560, V561, V562, V563, V5631, V5632, V568, E8702, E8712, E8722, E8742, E8791
ICD-9 Procedure codes: 3895, 3927, 3942, 3943, 3995, 5498
CPT codes: 36833, 90966, 90970, 90989, 90999, 90935, 90937, 90940, 90945, 90947, 99512, 99601, 99602, 4051F, 4052F, 4053F, 4054F, 4055F

Current Admission
40301, 40311, 40391, 40402, 40403, 40412, 40413, 40492, 40493, 5855, 5856, V420

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

Diabetes
Look-back Period or Current Admission
24900, 24901, 24910, 24911, 24920, 24921, 24930, 24931, 24940, 24941, 24950, 24951, 24960, 24961, 24970, 24971, 24980, 24981, 24990, 24991, 25000, 25001, 25002, 25003, 2501, 25010, 25011, 25013, 25012, 2502, 25020, 25021, 25022, 25023, 2503, 25030, 25031, 25032, 25033, 2504, 25040, 25041, 25042, 25043, 2505, 25050, 25051, 25052, 25053, 2506, 25060, 25061, 25062, 25063, 2507, 25070, 25071, 25072, 25073, 2508, 25080, 25081, 25082, 25083, 2509, 25090, 25091, 25092, 25093, 6480, 64800, 64801, 64802, 64803, 64804, 6488, 64880, 64881, 64882, 64883, 64884, 7751

Paraplegia
Look-back Period
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, 34461, 3448, 34481, 34489, 3449, 4382, 43820, 43821, 43822, 4383, 43830, 43831, 43832, 4384, 43840, 43841, 43842, 4385, 43850, 43851, 43852, 43853, 78072

Current Admission
3430, 3431, 3432, 3433, 3434, 3438, 3439, 43820, 43821, 43822, 43830, 43831, 43832, 43840, 43841, 43842, 43850, 43851, 43852, 43853

Collagen Vascular Disease
Look-back Period or Current Admission
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
Look-back Period or Current Admission
2870, 2871, 2872, 2878, 2879

Thrombocytopenia
Look-back Period
2873, 28730, 28731, 28732, 28733, 2874, 28741, 28749, 2875, 28984

Current Admission
2873, 28730, 28731, 28732, 28733

Hemophilia/Congenital Coagulopathy
Look-back Period or Current Admission
2860, 2861, 2862, 2863, 2864, 2865, 28652, 28653, 28659, 2866, 2867, 2869

Smoking History
Look-back Period or Current Admission
V1582

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

Post Inflammatory Pulmonary Fibrosis
Look-back Period or Current Admission
515, 51631, 51632, 51633, 51634

Cushing's Disease (*)
Look-back Period or Current Admission
2550

Graves' Disease
Look-back Period or Current Admission
2420, 24200, 24201

Cancer
Look-back Period or Current Admission
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, 17300, 17301, 17309, 1731, 17310, 17311, 17312, 17319, 1732, 17320, 17321, 17322, 17329, 1733, 17330, 17331, 17332, 17339, 1734, 17340, 17341, 17342, 17349, 1735, 17350, 17351, 17352, 17359, 1736, 17360, 17361, 17362, 17369, 1737, 17370, 17371, 17372, 17379,1738, 17380, 17381, 17382, 17389,1739, 17390, 17391, 17392, 17399, 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, 1992, 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, 20030, 20031, 20032, 20033, 20034, 20035, 20036, 20037, 20038,

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

20040, 20041, 20042, 20043, 20044, 20045, 20046, 20047, 20048, 20050, 20051, 20052, 20053, 20054, 20055, 20056, 20057, 20058, 20060, 20061, 20062, 20063, 20064, 20065, 20066, 20067, 20068, 20070, 20071, 20072, 20073, 20074, 20075, 20076, 20077, 20078, 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, 2027, 20270, 20271, 20272, 20273, 20274, 20275, 20276, 20277, 20278, 2028, 20280, 20281, 20282, 20283, 20284, 20285, 20286, 20287, 20288, 2029, 20290, 20291, 20292, 20293, 20294, 20295, 20296, 20297, 20298, 203, 2030, 20300, 20301, 20302, 2031, 20310, 20311, 20312, 2038, 20380, 20381, 20382, 204, 2040, 20400, 20401, 20402, 2041, 20410, 20411, 20412, 2042, 20420, 20421, 20422, 2048, 20480, 20481, 20482, 2049, 20490, 20491, 20492, 205, 2050, 20500, 20501, 20502, 2051, 20510, 20511, 20512, 2052, 20520, 20521, 20522, 2053, 20530, 20531, 20532, 2058, 20580, 20581, 20582, 2059, 20590, 20591, 20592, 206, 2060, 20600, 20601, 20602, 2061, 20610, 20611, 20612, 2062, 20620, 20621, 20622, 2068, 20680, 20681, 20682, 2069, 20690, 20691, 20692, 207, 2070, 20700, 20701, 20702, 2071, 20710, 20711, 20712, 2072, 20720, 20721, 20722, 2078, 20780, 20781, 20782, 208, 2080, 20800, 20801, 20802, 2081, 20810, 20811, 20812, 2082, 20820, 20821, 20822, 2088, 20880, 20881, 20882, 2089, 20891, 20892, 20900, 20901, 20902, 20903, 20910, 20911, 20912, 20913, 20914, 20915, 20916, 20917, 20920, 20921, 20922, 20923, 20924, 20925, 20926, 20927, 20929, 20930, 20931, 20932, 20933, 20934, 20935, 20936, 20970, 20971, 20972, 20973, 20974, 20975, 20979, 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, V1090, V1091, V5811, V5812

Specific Abdominal Cancer
Look-back Period or Current Admission
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
Look back period or Current Admission
243, 2440, 2441, 2442, 2448, 2449

APPENDIX C: Definitions of comorbidities (unless otherwise specified, all ICD-9 diagnosis codes)

Chronic Peptic Ulcer Disease
<u>Look-back Period</u>
53141, 53151, 53161, 53170, 53171, 53191

<u>Current Admission</u>
53141, 53151, 53161, 53170, 53171

HIV and AIDS (*)
<u>Look-back Period or Current Admission</u>
042

Weight Loss
<u>Look-back Period or Current Admission</u>
260, 261, 262, 263, 2630, 2631, 2632, 2638, 2639, 2690, 2691, 2692, 2693, 2698, 2699, 78321, 78322

Sickle Cell Anemia (*)
<u>Look-back Period or Current Admission</u>
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.

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
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[a]	**Secondary diagnosis codes:** I248, I249, T82110A, T82111A, T82118A, T82119A, T82120A, T82121A, T82128A, T82129A, T82190A, T82191A, T82198A, T82199A or ((I97120, I97121, I97190, I97191, I97710, I97711, I97790, I97791, I9788, I9789) and any of (I441, I4581, I4589, I480, I4891, I495, I498, R001, R9431)) **Secondary procedure codes:** 0270046, 027004Z, 02700D6, 02700DZ, 02700T6, 02700TZ, 0270346, 027034Z, 02703D6, 02703DZ, 02703T6, 02703TZ, 0270446, 027044Z, 02704D6, 02704DZ, 02704T6, 02704TZ, 0271046, 027104Z, 02710D6, 02710DZ, 02710T6, 02710TZ, 0271346, 027134Z, 02713D6, 02713DZ, 02713T6, 02713TZ, 0271446, 027144Z, 02714D6, 02714DZ, 02714T6, 02714TZ, 0272046, 027204Z, 02720D6, 02720DZ, 02720T6, 02720TZ, 0272346, 027234Z, 02723D6, 02723DZ, 02723T6, 02723TZ, 0272446, 027244Z, 02724D6, 02724DZ, 02724T6, 02724TZ, 0273046, 027304Z, 02730D6, 02730DZ, 02730T6, 02730TZ, 0273346, 027334Z, 02733D6, 02733DZ, 02733T6, 02733TZ, 0273446, 027344Z, 02734D6, 02734DZ, 02734T6, 02734TZ, 02C03ZZ, 02C04ZZ, 02C13ZZ, 02C14ZZ, 02C23ZZ, 02C24ZZ, 02C33ZZ, 02C34ZZ, 0JH604Z, 0JH605Z, 0JH606Z, 0JH60PZ, 0JH634Z, 0JH635Z, 0JH636Z, 0JH63PZ, 0JH804Z, 0JH805Z, 0JH806Z, 0JH80PZ, 0JH834Z, 0JH835Z, 0JH836Z, 0JH83PZ, 0JPT0PZ, 0JPT3PZ, 5A1213Z, 5A1223Z **CPT procedure codes**: 33206, 33207, 33208, 33210, 33211, 33212, 33213, 33214, 33216, 33217, 33240, 33249, 92953	

† When ICD or CPT procedure codes are used to define a complication then there will be either a superscript (a) that indicates the complication occurring if secondary or CPT procedure code is equal to or later than the date of surgery or a superscript (b) that indicates the complication occurring if secondary or CPT procedure code is later than the day of surgery

‡ Depending on the study, the look back period may differ between 90 or 180 days

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
2. Cardiac Emergency[a]	**Secondary diagnosis codes:** I2101, I2102, I2109, I2111, I2119, I2121, I2129, I213, I214, I220, I221, I222, I228, I229, I462, I468, I469, I470, I472, I4901, R570, R579 **Secondary procedure codes:** (02QA0ZZ, 5A02110, 5A02210, 5A12012, 5A2204Z and exclusion) **CPT procedure codes:** (92950, 92960, 92970, 9297192997, 92998 and exclusion)	**Principal diagnosis codes:** I462, I468, I469, R092, R570, R571, R578, R579 **Principal procedure codes:** 5A12012, 5A19054
3. CHF	**Secondary diagnosis codes:** I5021, I5023, I5031, I5033, I5041, I5043, J810 or ((I97110, I97111, I97120, I97121, I97130, I97131, I97190, I97191, I97710, I97711, I97790, I97791, I9788, I9789) and any of (I501, I5020, I5021, I5023, I5030, I5031, I5033, I5040, I5041, I5043, I509)) or (any of (I501, I5020, I5021, I5023, I5030, I5031, I5033, I5040, I5041, I5043, I509) and exclusion)	History of CHF defined as any of the following diagnoses during a look back period‡: I0981, I110, I130, I132, I501, I5020, I5021, I5022, I5023, I5030, I5031, I5032, I5033, I5040, I5041, I5042, I5043, I509, J810
4. Hypotension/Shock/ Hypovolemia	**Secondary diagnosis codes:** E860, E861, E869, I959, R031, R570, R571, R578, R579, R6521, T782XXA, T8110XA, T8111XA, T8112XA, T8119XA, T882XXA, T886XXA	
5. Pulmonary embolus[a]	**Secondary diagnosis codes:** I2601, I2602, I2690, I2692, I2699, T791XXA, T800XXA, T82817A, T82818A **(CPT procedure codes:** 75741, 75743, 78579, 78580, 78582, 78599 with Secondary procedure codes: 02HV02Z, 02HV0DZ, 02HV32Z, 02HV3DZ, 02HV42Z, 02HV4DZ, 02LV0CZ, 02LV0DZ, 02LV0ZZ, 02LV3CZ, 02LV3DZ, 02LV3ZZ, 02LV4CZ, 02LV4DZ, 02LV4ZZ, 02VV0CZ, 02VV0DZ, 02VV0ZZ, 02VV3CZ, 02VV3DZ, 02VV3ZZ, 02VV4CZ, 02VV4DZ, 02VV4ZZ, 06H00DZ, 06H03DZ, 06H04DZ, 06L00CZ, 06L00DZ, 06L00ZZ, 06L03CZ, 06L03DZ, 06L03ZZ, 06L04CZ, 06L04DZ, 06L04ZZ, 06V00CZ, 06V00DZ, 06V00ZZ, 06V03CZ, 06V03DZ, 06V03ZZ, 06V04CZ, 06V04DZ, 06V04ZZ) OR CPT procedure codes: 75894, 75896	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
6. Deep Vein Thrombosis[b]	**Secondary diagnosis codes:** I82210, I82211, I82290, I82291, I82401, I82402, I82403, I82409, I82411, I82412, I82413, I82419, I82421, I82422, I82423, I82429, I82431, I82432, I82433, I82439, I82441, I82442, I82443, I82449, I82491, I82492, I82493, I82499, I824Y1, I824Y2, I824Y3, I824Y9, I824Z1, I824Z2, I824Z3, I824Z9, I82501, I82502, I82503, I82509, I82511, I82512, I82513, I82519, I82521, I82522, I82523, I82529, I82531, I82532, I82533, I82539, I82541, I82542, I82543, I82549, I82591, I82592, I82593, I82599, I825Y1, I825Y2, I825Y3, I825Y9, I825Z1, I825Z2, I825Z3, I825Z9, I82601, I82602, I82603, I82609, I82611, I82612, I82613, I82619, I82621, I82622, I82623, I82629, I82701, I82702, I82703, I82709, I82711, I82712, I82713, I82719, I82721, I82722, I82723, I82729, I82811, I82812, I82813, I82819, I82890, I82891, I8290, I8291, I82A11, I82A12, I82A13, I82A19, I82A21, I82A22, I82A23, I82A29, I82B11, I82B12, I82B13, I82B19, I82B21, I82B22, I82B23, I82B29, I82C11, I82C12, I82C13, I82C19, I82C21, I82C22, I82C23, I82C29 **Secondary procedure codes:** 02HV02Z, 02HV0DZ, 02HV32Z, 02HV3DZ, 02HV42Z, 02HV4DZ, 02LV0CZ, 02LV0DZ, 02LV0ZZ, 02LV3CZ, 02LV3DZ, 02LV3ZZ, 02LV4CZ, 02LV4DZ, 02LV4ZZ, 02VV0CZ, 02VV0DZ, 02VV0ZZ, 02VV3CZ, 02VV3DZ, 02VV3ZZ, 02VV4CZ, 02VV4DZ, 02VV4ZZ, 06H00DZ, 06H03DZ, 06H04DZ, 06L00CZ, 06L00DZ, 06L00ZZ, 06L03CZ, 06L03DZ, 06L03ZZ, 06L04CZ, 06L04DZ, 06L04ZZ, 06V00CZ, 06V00DZ, 06V00ZZ, 06V03CZ, 06V03DZ, 06V03ZZ, 06V04CZ, 06V04DZ, 06V04ZZ	
7. Phlebitis[b]	**Secondary diagnosis codes:** I8000, I8001, I8002, I8003, I8010, I8011, I8012, I8013, I80201, I80202, I80203, I80209, I80211, I80212, I80213, I80219, I80221, I80222, I80223, I80229, I80231, I80232, I80233, I80239, I80291, I80292, I80293, I80299, I803, I808, I809	
8. Cerebrovascular Accident (CVA)/Stroke[a]	**Secondary diagnosis codes:** (G9731, G9732, I610, I611, I612, I613, I614, I615, I616, I618, I619, I6300, I63011,	History of CVA/stroke defined as any of the following diagnoses during a look back period:

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	I63012, I63019, I6302, I63031, I63032, I63039, I6309, I6310, I63111, I63112, I63119, I6312, I63131, I63132, I63139, I6319, I6320, I63211, I63212, I63219, I6322, I63231, I63232, I63239, I6329, I6330, I63311, I63312, I63319, I63321, I63322, I63329, I63331, I63332, I63339, I63341, I63342, I63349, I6339, I6340, I63411, I63412, I63419, I63421, I63422, I63429, I63431, I63432, I63439, I63441, I63442, I63449, I6349, I6350, I63511, I63512, I63519, I63521, I63522, I63529, I63531, I63532, I63539, I63541, I63542, I63549, I6359, I636, I638, I639, I6789, I97810, I97811, I97820, I97821 and exclusion)	G9731, G9732, I610, I611, I612, I613, I614, I615, I616, I618, I619, I6300, I63011, I63012, I63019, I6302, I63031, I63032, I63039, I6309, I6310, I63111, I63112, I63119, I6312, I63131, I63132, I63139, I6319, I6320, I63211, I63212, I63219, I6322, I63231, I63232, I63239, I6329, I6330, I63311, I63312, I63319, I63321, I63322, I63329, I63331, I63332, I63339, I63341, I63342, I63349, I6339, I6340, I63411, I63412, I63419, I63421, I63422, I63429, I63431, I63432, I63439, I63441, I63442, I63449, I6349, I6350, I63511, I63512, I63519, I63521, I63522, I63529, I63531, I63532, I63539, I63541, I63542, I63549, I6359, I636, I638, I639, I6789, I6900, I6901, I69020, I69021, I69022, I69023, I69028, I69031, I69032, I69033, I69034, I69039, I69041, I69042, I69043, I69044, I69049, I69051, I69052, I69053, I69054, I69059, I69061, I69062, I69063, I69064, I69065, I69069, I69090, I69091, I69092, I69093, I69098, I6910, I6911, I69120, I69121, I69122, I69123, I69128, I69131, I69132, I69133, I69134, I69139, I69141, I69142, I69143, I69144, I69149, I69151, I69152, I69153, I69154, I69159, I69161, I69162, I69163, I69164, I69165, I69169, I69190, I69191, I69192, I69193, I69198, I6920, I6921, I69220, I69221, I69222, I69223, I69228, I69231, I69232, I69233, I69234, I69239, I69241, I69242, I69243, I69244, I69249, I69251, I69252, I69253, I69254, I69259, I69261, I69262, I69263, I69264, I69265, I69269, I69290, I69291, I69292, I69293, I69298, I6930, I6931, I69320, I69321, I69322, I69323, I69328, I69331, I69332, I69333, I69334, I69339, I69341, I69342, I69343, I69344, I69349, I69351, I69352, I69353, I69354, I69359, I69361, I69362, I69363, I69364, I69365, I69369, I69390, I69391, I69392, I69393, I69398, I6980, I6981, I69820, I69821, I69822, I69823, I69828, I69831, I69832, I69833, I69834, I69839, I69841, I69842, I69843, I69844, I69849, I69851, I69852, I69853, I69854, I69859, I69861, I69862, I69863, I69864, I69865, I69869, I69890, I69891, I69892, I69893, I69898, I6990, I6991, I69920, I69921, I69922, I69923, I69928, I69931, I69932, I69933, I69934, I69939, I69941, I69942, I69943, I69944, I69949, I69951, I69952, I69953,

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
		I69954, I69959, I69961, I69962, I69963, I69964, I69965, I69969, I69990, I69991, I69992, I69993, I69998, I97810, I97811, I97820, I97821, Z8673, Z8674, Z8679
9. Transient Ischemic Attack (TIA)	**Secondary diagnosis codes:** G450, G451, G452, G458, G459, G460, G461, G462, I67841, I67848	
10. Coma	**Secondary diagnosis codes:** E035, G931, K7111, K7201, K7211, K7291, R4020, R402110, R402114, R402120, R402124, R402210, R402214, R402220, R402224, R402310, R402314, R402320, R402324, R402340, R402344	
11. Seizure[b]	**Secondary diagnosis codes:** (R5600, R561, R569 and exclusion)	History of seizure defined as any of the following diagnoses during a look back period: G40001, G40009, G40011, G40019, G40101, G40109, G40111, G40119, G40201, G40209, G40211, G40219, G40301, G40309, G40311, G40319, G40401, G40409, G40411, G40419, G40501, G40509, G40801, G40802, G40803, G40804, G40811, G40812, G40813, G40814, G40821, G40822, G40823, G40824, G4089, G40901, G40909, G40911, G40919, G40A01, G40A09, G40A11, G40A19, G40B01, G40B09, G40B11, G40B19
12. Psychosis	**Secondary diagnosis codes:** F0390, F0391, F05, F060, F061, F068, F11121, F11122, F1114, F11150, F11151, F11159, F11181, F11182, F11188, F1119, F11220, F11221, F11222, F11229, F1123, F1124, F11250, F11251, F11259, F11281, F11282, F11288, F1129, F11920, F11921, F11922, F11929, F1193, F1194, F11950, F11951, F11959, F11981, F11982, F11988, F1199, F13121, F13129, F1314, F13150, F13151, F13159, F13180, F13181, F13182, F13188, F1319, F13220, F13221, F13229, F13230, F13231, F13232, F13239, F1324, F13250, F13251, F13259, F1326, F1327, F13280, F13281, F13282, F13288, F1329, F13920, F13921, F13929, F13930, F13931, F13932, F13939, F1394, F13950, F13951, F13959, F1396, F1397, F13980, F13981, F13982, F13988, F1399, F1423, F15121, F15221, F1523, F15921, F1593, F17203, F17213, F17223, F17293, F19121, F19122, F19129, F1914, F19150, F19151, F19159, F1916, F1917, F19180, F19181, F19182, F19188, F1919, F1921, F19220, F19221, F19222, F19229, F19230, F19231, F19232,	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	F19239, F1924, F19250, F19251, F19259, F1926, F1927, F19280, F19281, F19282, F19288, F1929, F19920, F19921, F19922, F19929, F19930, F19931, F19932, F19939, F1994, F19950, F19951, F19959, F1996, F1997, F19980, F19981, F19982, F19988, F1999	
13. Nervous System Complications[a]	**Secondary diagnosis codes:** G038, G970, G972, G9781, G9782 **Secondary procedure codes:** 009U30Z, 009U3ZZ, 009U40Z, 009U4ZZ, 4A0004Z, 4A0034Z, 4A00X4Z, 4A0104Z, 4A0134Z, 4A01X4Z, 4A1004Z, 4A1034Z, 4A10X4Z, 4A1104Z, 4A1134Z, 4A11X4Z	
14. Pneumonia-Aspiration	**Secondary diagnosis codes:** J690, J691, J698 or ((J954, J95851, J95859, J9588, J9589) and any of (J159, J180, J188, J189))	
15. Pneumonia, other	**Secondary diagnosis codes:** A481, J13, J14, J150, J151, J1520, J15211, J15212, J1529, J153, J154, J155, J156, J158, J159, J180, J181, J188, J189 or (J182, J954, J95851, J95859, J9588, J9589 and exclusion)	**DRG** DRG=475(2004-2006)75-102(2004-2007) 565, 566 (2007) 163-208 (2008-2009) **Any diagnosis codes:** *1) Viral Pneumonia/SARS* A221, A3701, A3711, A3781, A3791, B250, B440, B7781, J09X1, J1000, J1001, J1008, J101, J1089, J1100, J1108, J111, J1189, J120, J121, J122, J123, J1281, J1289, J129, J157, J160, J168, J17 *2) Immunocompromised State* B20, B59, D800, D801, D802, D803, D804, D805, D806, D807, D808, D809, D810, D811, D812, D814, D816, D817, D8189, D819, D820, D821, D822, D823, D824, D828, D829, D830, D831, D832, D838, D839, D840, D841, D848, D849, D893, D8982, D8989, D899, M359
16. Pneumothorax/Effusion[b]	**Secondary diagnosis codes:** J930 or (J9311, J9312, J9381, J9382, J9383, J939, J95811, J95812, J9811 and exclusion) **Secondary procedure codes:** (0B9N3ZZ, 0B9N40Z, 0B9N4ZZ, 0B9P3ZZ, 0B9P40Z, 0B9P4ZZ, 0W9930Z, 0W993ZZ, 0W9940Z, 0W9B30Z, 0W9B3ZZ, 0W9B40Z and exclusion)	In the OBSOS Thoracotomy Procedure Category
17. Respiratory Compromise[b]	DRG = 483(2002- Sept 2004) 541, 542 (Oct 2004-2009) **Secondary diagnosis codes:**	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	J951, J952, J953, J95821, J95822, J9600, J9601, J9602, J9620, J9621, J9622, J9690, J9691, J9692, J984, R092 **Secondary procedure codes:** 0B110F4, 0B110Z4, 0B113F4, 0B113Z4, 0B114F4, 0B114Z4, 0BH13EZ, 0BH17EZ, 0BH18EZ, 5A1955Z **CPT procedure codes:** 31500, 31603, 31605, 31610	
18. Bronchospasm	**Secondary diagnosis codes:** J9801	
19. Internal Organ Damage[b]	**Secondary diagnosis codes:** D7801, D7802, D7811, D7812, D7821, D7822, E3601, E3602, E3611, E3612, G9611, G9731, G9732, G9741, G9751, G9752, I97410, I97411, I97418, I9742, I9751, I9752, I97610, I97611, I97618, I9762, J9561, J9562, J9571, J9572, J95830, J95831, K9161, K9162, K9171, K9172, K91840, K91841, M96810, M96811, M96820, M96821, M96830, M96831, N9961, N9962, N9971, N9972, N99820, N99821, T888XXA **Secondary procedure codes:** (0D9S00Z, 0D9S0ZZ, 0D9T00Z, 0D9T0ZZ, 0D9V00Z, 0D9V0ZZ, 0D9W00Z, 0D9W0ZZ, 0W300ZZ, 0W303ZZ, 0W304ZZ, 0W310ZZ, 0W313ZZ, 0W314ZZ, 0W320ZZ, 0W323ZZ, 0W324ZZ, 0W330ZZ, 0W333ZZ, 0W334ZZ, 0W337ZZ, 0W338ZZ, 0W33XZZ, 0W360ZZ, 0W363ZZ, 0W364ZZ, 0W390ZZ, 0W393ZZ, 0W394ZZ, 0W3B0ZZ, 0W3B3ZZ, 0W3B4ZZ, 0W3C0ZZ, 0W3C3ZZ, 0W3C4ZZ, 0W3G0ZZ, 0W3H0ZZ, 0W3K0ZZ, 0W3K3ZZ, 0W3K4ZZ, 0W3L0ZZ, 0W3L3ZZ, 0W3L4ZZ, 0W3P0ZZ, 0W3Q3ZZ, 0W3Q4ZZ, 0W3Q7ZZ, 0W9G00Z, 0W9G0ZZ, 0WCJ0ZZ, 0WCP0ZZ, 0WCR0ZZ, 0WJG0ZZ, 0WJH0ZZ, 0WJJ0ZZ and exclusion) **CPT procedure codes:** (35800, 35820, 35840, 35860 and exclusion)	
20. Perforation	**Secondary diagnosis codes:** D7811, D7812, E3611, E3612, G9611, G9741, G9748, G9749, H59219, H59229,	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	I9751, I9752, J9571, J9572, K223, K631, K9171, K9172, M96820, M96821, N9971, N9972, T888XXA	
21. Peritonitis[b]	**Secondary diagnosis codes:** K630, K650, K651, K652, K658, K659, K67, K6819, K689 **Secondary procedure codes:** (0D9S30Z, 0D9S3ZZ, 0D9S40Z, 0D9S4ZZ, 0D9T30Z, 0D9T3ZZ, 0D9T40Z, 0D9T4ZZ, 0D9V30Z, 0D9V3ZZ, 0D9V40Z, 0D9V4ZZ, 0D9W30Z, 0D9W3ZZ, 0D9W40Z, 0D9W4ZZ, 0W9F30Z, 0W9F3ZZ, 0W9F40Z, 0W9F4ZZ, 0W9G30Z, 0W9G3ZZ, 0W9G40Z, 0W9G4ZZ, 0W9J30Z, 0W9J3ZZ and exclusion)	Comorbidity of liver disease/dysfunction defined in Appendix C, as diagnosis in the index admission or in the look back period
22. GI Bleed and Blood Loss[b]	**Secondary diagnosis codes:** [D62 or ((K920, K921, K922) and principal procedure exclusion), or ((K226) and DRG exclusion 1) or any of ((I8501, I8511, K228, K250, K252, K253, K259, K260, K261, K262, K263, K269, K270, K271, K272, K273, K279, K280, K281, K282, K283, K289, K2901, K2960, K2961, K2971, K2981, K2991, K3182, K5281, K5521, K5721, K5731, K5733, K5741, K5751, K5753, K5781, K5791, K5793, K625, K922) and DRG exclusion 2)] and exclusion of Trauma defined by DRG or by principal diagnosis or History of alcoholism **CPT procedure codes:** (43227, 43255, 44366, 44391, 45317, 45334, 75726 and principal procedure exclusion)	Trauma defined by DRG or principal diagnosis or History of alcoholism *Trauma as defined by principal diagnoses (lowercase letter x's denote a wildcard character; for seven-digit codes, final letter must be A, B, or C):* M991x, S01xxxx, S02xxxx, S030xxx-S032xxx, S052xxx-S059xxx, S06xxxx, S07xxxx, S08xxxx, S090xxx, S0912xx, S092xxx-S099xxx, S11xxxx, S12xxxx, S130xxx-S132xxx, S140xxx-S143xxx, S15xxxx, S162xxx, S17xxxx, S21xxxx, S22xxxx, S230xxx-S232xxx, S240xxx-S242xxx, S25xxxx, S26xxxx, S27xxxx, S28xxxx, S2902xx, S31xxxx, S32xxxx, S330xxx-S333xxx, S340xxx-S344xxx, S35xxxx, S36xxxx, S37xxxx, S38xxxx, S3902xx, S41xxxx, S42xxxx, S430xxx-S433xxx, S45xxxx, S46x2xx, S47xxxx, S48xxxx, S490xxx-S491xxx, S51xxxx, S52xxxx, S530xxx-S531xxx, S55xxxx, S56x2xx, S57xxxx, S58xxxx, S590xxx-S592xxx, S61009A, S61209A, S614xxx-S615xxx, S620xxx-S623xxx, S6290xx, S630xxx-S632xxx, S65xxxx, S66x2xx, S67xxxx, S684xxx, S687xxx, S71xxxx, S72xxxx, S730xxx, S75xxxx, S76x2xx, S77xxxx, S78xxxx, S790xxx-S791xxx, S81xxxx, S82xxxx, S830xxx-S833xxx, S85xxxx, S86x2xx, S87xxxx, S88xxxx, S890xxx-S893xxx, S910xxx, S913xxx, S920xxx-S923xxx, S9290xx, S930xxx-S933xxx, S95xxxx, S96x2xx, S97xxxx, S980xxx, S983xxx, S989xxx, T20xxxx, T21xxxx, T22xxxx, T23xxxx, T24xxxx, T25xxxx, T26xxxx, T27xxxx, T28xxxx,

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
		T300, T304, T30xxxx, T310, T31xx, T31xxxx, T32xx, T32xxxx, T79xxxx *Trauma DRGs* 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(2004-2007) 027, 082, 083, 084, 085, 086, 087, 088, 089, 090, 154, 155, 156, 183, 184, 185, 483, 484, 533, 534, 535, 536, 537, 538, 901, 902, 903, 906, 907, 908, 909, 913, 914, 927, 928, 929, 933, 934, 935, 955, 956, 957, 958, 959, 963, 964, 965(2008-2009) *History of alcoholism in look back period defined as secondary diagnosis* F1010, F10120, F10121, F10129, F1014, F10150, F10151, F10159, F10180, F10181, F10182, F10188, F1019, F1020, F10220, F10221, F10229, F10230, F10231, F10232, F10239, F1024, F10250, F10251, F10259, F1026, F1027, F10280, F10281, F10282, F10288, F1029, F10920, F10921, F10929, F1094, F10950, F10951, F10959, F1096, F1097, F10980, F10981, F10982, F10988, F1099 **Principal procedure codes:** 0DQ60ZZ, 0DQ63ZZ, 0DQ64ZZ, 0DQ67ZZ, 0DQ68ZZ, 0DQ90ZZ, 0DQ93ZZ, 0DQ94ZZ, 0DQ97ZZ, 0DQ98ZZ if secondary diagnosis in (K920, K921, K922) **DRG** 1) *DRG* = 146-171(2004-2007) 332-358(2008-2009) if secondary diagnosis = K226 2) *DRG* = 146-167, 170-184, 188-208 (2004-2007); 326-358, 374-395, 405-446 (2008-2009) if any of the secondary diagnoses in the inclusion are in the set of diagnoses (I8501, I8511, K228, K250, K252, K253, K259, K260, K261, K262, K263, K269, K270, K271, K272, K273, K279, K280, K281, K282, K283, K289, K2901, K2960, K2961, K2971, K2981, K2991, K3182, K5281, K5521, K5721, K5731, K5733, K5741, K5751, K5753, K5781, K5791, K5793, K625, K922)
23. Sepsis	**Secondary diagnosis codes:**	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	A400, A401, A403, A408, A409, A4101, A4102, A411, A412, A413, A414, A4150, A4151, A4152, A4153, A4159, A4181, A4189, A419, A427, I76, R6521, R7881	
24. Deep Wound Infection/ Wound Complication[b]	**Secondary diagnosis codes:** K6811, T8130XA, T8131XA, T8132XA, T8133XA, T814XXA, T8183XA **Secondary procedure codes:** (0H90X0Z, 0H90XZZ, 0H91X0Z, 0H91XZZ, 0H94X0Z, 0H94XZZ, 0H95X0Z, 0H95XZZ, 0H96X0Z, 0H96XZZ, 0H97X0Z, 0H97XZZ, 0H98X0Z, 0H98XZZ, 0H9AX0Z, 0H9AXZZ, 0H9BX0Z, 0H9BXZZ, 0H9CX0Z, 0H9CXZZ, 0H9DX0Z, 0H9DXZZ, 0H9EX0Z, 0H9EXZZ, 0H9FX0Z, 0H9FXZZ, 0H9GX0Z, 0H9GXZZ, 0H9HX0Z, 0H9HXZZ, 0H9JX0Z, 0H9JXZZ, 0H9KX0Z, 0H9KXZZ, 0H9LX0Z, 0H9LXZZ, 0H9MX0Z, 0H9MXZZ, 0H9NX0Z, 0H9NXZZ, 0HB0XZZ, 0HB1XZZ, 0HB4XZZ, 0HB5XZZ, 0HB6XZZ, 0HB7XZZ, 0HB8XZZ, 0HBAXZZ, 0HBBXZZ, 0HBCXZZ, 0HBDXZZ, 0HBEXZZ, 0HBFXZZ, 0HBGXZZ, 0HBHXZZ, 0HBJXZZ, 0HBKXZZ, 0HBLXZZ, 0HBMXZZ, 0HBNXZZ, 0HQ0XZZ, 0HQ1XZZ, 0HQ2XZZ, 0HQ3XZZ, 0HQ4XZZ, 0HQ5XZZ, 0HQ6XZZ, 0HQ7XZZ, 0HQ8XZZ, 0HQ9XZZ, 0HQAXZZ, 0HQBXZZ, 0HQCXZZ, 0HQDXZZ, 0HQEXZZ, 0HQFXZZ, 0HQGXZZ, 0HQHXZZ, 0HQJXZZ, 0HQKXZZ, 0HQLXZZ, 0HQMXZZ, 0HQNXZZ, 0HQTXZZ, 0HQUXZZ, 0HQVXZZ, 0HX0XZZ, 0HX1XZZ, 0HX4XZZ, 0HX5XZZ, 0HX6XZZ, 0HX7XZZ, 0HX8XZZ, 0HXAXZZ, 0HXBXZZ, 0HXCXZZ, 0HXDXZZ, 0HXEXZZ, 0HXFXZZ, 0HXGXZZ, 0HXHXZZ, 0HXJXZZ, 0HXKXZZ, 0HXLXZZ, 0HXMXZZ, 0HXNXZZ, 0J9000Z, 0J9400Z, 0J940ZZ, 0J9500Z, 0J950ZZ, 0J9600Z, 0J960ZZ, 0J9700Z, 0J970ZZ, 0J9800Z, 0J980ZZ, 0J9900Z, 0J990ZZ, 0J9B00Z, 0J9B0ZZ, 0J9C00Z, 0J9C0ZZ, 0J9D00Z, 0J9D0ZZ, 0J9F00Z, 0J9F0ZZ, 0J9G00Z, 0J9G0ZZ, 0J9H00Z, 0J9H0ZZ, 0J9J00Z, 0J9J0ZZ, 0J9K00Z, 0J9K0ZZ, 0J9L00Z, 0J9L0ZZ, 0J9M00Z, 0J9M0ZZ, 0J9N00Z, 0J9N0ZZ,	Any diagnosis code of Decubitus Ulcer: L89000, L89001, L89002, L89003, L89004, L89009, L89010, L89011, L89012, L89013, L89014, L89019, L89020, L89021, L89022, L89023, L89024, L89029, L89100, L89101, L89102, L89103, L89104, L89109, L89110, L89111, L89112, L89113, L89114, L89119, L89120, L89121, L89122, L89123, L89124, L89129, L89130, L89131, L89132, L89133, L89134, L89139, L89140, L89141, L89142, L89143, L89144, L89149, L89150, L89151, L89152, L89153, L89154, L89159, L89200, L89201, L89202, L89203, L89204, L89209, L89210, L89211, L89212, L89213, L89214, L89219, L89220, L89221, L89222, L89223, L89224, L89229, L89300, L89301, L89302, L89303, L89304, L89309, L89310, L89311, L89312, L89313, L89314, L89319, L89320, L89321, L89322, L89323, L89324, L89329, L8940, L8941, L8942, L8943, L8944, L8945, L89500, L89501, L89502, L89503, L89504, L89509, L89510, L89511, L89512, L89513, L89514, L89519, L89520, L89521, L89522, L89523, L89524, L89529, L89600, L89601, L89602, L89603, L89604, L89609, L89610, L89611, L89612, L89613, L89614, L89619, L89620, L89621, L89622, L89623, L89624, L89629, L89810, L89811, L89812, L89813, L89814, L89819, L89890, L89891, L89892, L89893, L89894, L89899, L8990, L8991, L8992, L8993, L8994, L8995

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	0J9P00Z, 0J9P0ZZ, 0J9Q00Z, 0J9Q0ZZ, 0J9R00Z, 0J9R0ZZ, 0JB00ZZ, 0JB10ZZ, 0JB40ZZ, 0JB50ZZ, 0JB60ZZ, 0JB70ZZ, 0JB80ZZ, 0JB90ZZ, 0JBB0ZZ, 0JBC0ZZ, 0JBD0ZZ, 0JBF0ZZ, 0JBG0ZZ, 0JBH0ZZ, 0JBL0ZZ, 0JBM0ZZ, 0JBN0ZZ, 0JBP0ZZ, 0JBQ0ZZ, 0JBR0ZZ, 0JQ10ZZ, 0JQ13ZZ, 0JQ40ZZ, 0JQ43ZZ, 0JQ50ZZ, 0JQ53ZZ, 0JQ60ZZ, 0JQ63ZZ, 0JQ70ZZ, 0JQ73ZZ, 0JQ80ZZ, 0JQ83ZZ, 0JQ90ZZ, 0JQ93ZZ, 0JQB0ZZ, 0JQB3ZZ, 0JQC0ZZ, 0JQC3ZZ, 0JQD0ZZ, 0JQD3ZZ, 0JQF0ZZ, 0JQF3ZZ, 0JQG0ZZ, 0JQG3ZZ, 0JQH0ZZ, 0JQH3ZZ, 0JQJ0ZZ, 0JQJ3ZZ, 0JQK0ZZ, 0JQK3ZZ, 0JQL0ZZ, 0JQL3ZZ, 0JQM0ZZ, 0JQM3ZZ, 0JQN0ZZ, 0JQN3ZZ, 0JQP0ZZ, 0JQP3ZZ, 0JQQ0ZZ, 0JQQ3ZZ, 0JQR0ZZ, 0JQR3ZZ, 0JX00ZB, 0JX00ZC, 0JX03ZB, 0JX03ZC, 0JX10ZB, 0JX10ZC, 0JX13ZB, 0JX13ZC, 0JX40ZB, 0JX40ZC, 0JX43ZB, 0JX43ZC, 0JX50ZB, 0JX50ZC, 0JX53ZB, 0JX53ZC, 0JX60ZB, 0JX60ZC, 0JX63ZB, 0JX63ZC, 0JX70ZB, 0JX70ZC, 0JX73ZB, 0JX73ZC, 0JX80ZB, 0JX80ZC, 0JX83ZB, 0JX83ZC, 0JX90ZB, 0JX90ZC, 0JX93ZB, 0JX93ZC, 0JXB0ZB, 0JXB0ZC, 0JXB3ZB, 0JXB3ZC, 0JXC0ZB, 0JXC0ZC, 0JXC3ZB, 0JXC3ZC, 0JXD0ZB, 0JXD0ZC, 0JXD3ZB, 0JXD3ZC, 0JXF0ZB, 0JXF0ZC, 0JXF3ZB, 0JXF3ZC, 0JXG0ZB, 0JXG0ZC, 0JXG3ZB, 0JXG3ZC, 0JXH0ZB, 0JXH0ZC, 0JXH3ZB, 0JXH3ZC, 0JXL0ZB, 0JXL0ZC, 0JXL3ZB, 0JXL3ZC, 0JXM0ZB, 0JXM0ZC, 0JXM3ZB, 0JXM3ZC, 0JXN0ZB, 0JXN0ZC, 0JXN3ZB, 0JXN3ZC, 0JXP0ZB, 0JXP0ZC, 0JXP3ZB, 0JXP3ZC, 0JXQ0ZB, 0JXQ0ZC, 0JXQ3ZB, 0JXQ3ZC, 0JXR0ZB, 0JXR0ZC, 0JXR3ZB, 0JXR3ZC, 0W9000Z, 0W900ZZ, 0W9030Z, 0W9040Z, 0W904ZZ, 0W9K00Z, 0W9K0ZZ, 0W9K30Z, 0W9K40Z, 0W9K4ZZ, 0W9L00Z, 0W9L0ZZ, 0W9L30Z, 0W9L40Z, 0W9L4ZZ, 0W9M00Z, 0W9M0ZZ, 0W9M30Z, 0W9M40Z, 0W9M4ZZ, 0WQFXZZ, 0X9200Z, 0X920ZZ, 0X9230Z, 0X923ZZ, 0X9240Z, 0X924ZZ, 0X9300Z, 0X930ZZ, 0X9330Z, 0X933ZZ, 0X9340Z, 0X934ZZ, 0X9400Z, 0X940ZZ, 0X9430Z, 0X943ZZ, 0X9440Z, 0X944ZZ, 0X9500Z, 0X950ZZ,	

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(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	0X9530Z, 0X953ZZ, 0X9540Z, 0X954ZZ, 0X9600Z, 0X960ZZ, 0X9630Z, 0X963ZZ, 0X9640Z, 0X964ZZ, 0X9700Z, 0X970ZZ, 0X9730Z, 0X973ZZ, 0X9740Z, 0X974ZZ, 0X9800Z, 0X980ZZ, 0X9830Z, 0X983ZZ, 0X9840Z, 0X984ZZ, 0X9900Z, 0X990ZZ, 0X9930Z, 0X993ZZ, 0X9940Z, 0X994ZZ, 0X9B00Z, 0X9B0ZZ, 0X9B30Z, 0X9B3ZZ, 0X9B40Z, 0X9B4ZZ, 0X9C00Z, 0X9C0ZZ, 0X9C30Z, 0X9C3ZZ, 0X9C40Z, 0X9C4ZZ, 0X9D00Z, 0X9D0ZZ, 0X9D30Z, 0X9D3ZZ, 0X9D40Z, 0X9D4ZZ, 0X9F00Z, 0X9F0ZZ, 0X9F30Z, 0X9F3ZZ, 0X9F40Z, 0X9F4ZZ, 0X9G00Z, 0X9G0ZZ, 0X9G30Z, 0X9G3ZZ, 0X9G40Z, 0X9G4ZZ, 0X9H00Z, 0X9H0ZZ, 0X9H30Z, 0X9H3ZZ, 0X9H40Z, 0X9H4ZZ, 0Y9000Z, 0Y900ZZ, 0Y9030Z, 0Y903ZZ, 0Y9040Z, 0Y904ZZ, 0Y9100Z, 0Y910ZZ, 0Y9130Z, 0Y913ZZ, 0Y9140Z, 0Y914ZZ, 0Y9700Z, 0Y970ZZ, 0Y9730Z, 0Y973ZZ, 0Y9740Z, 0Y974ZZ, 0Y9800Z, 0Y980ZZ, 0Y9830Z, 0Y983ZZ, 0Y9840Z, 0Y984ZZ, 0Y9900Z, 0Y990ZZ, 0Y9930Z, 0Y993ZZ, 0Y9940Z, 0Y994ZZ, 0Y9B00Z, 0Y9B0ZZ, 0Y9B30Z, 0Y9B3ZZ, 0Y9B40Z, 0Y9B4ZZ, 0Y9C00Z, 0Y9C0ZZ, 0Y9C30Z, 0Y9C3ZZ, 0Y9C40Z, 0Y9C4ZZ, 0Y9D00Z, 0Y9D0ZZ, 0Y9D30Z, 0Y9D3ZZ, 0Y9D40Z, 0Y9D4ZZ, 0Y9F00Z, 0Y9F0ZZ, 0Y9F30Z, 0Y9F3ZZ, 0Y9F40Z, 0Y9F4ZZ, 0Y9G00Z, 0Y9G0ZZ, 0Y9G30Z, 0Y9G3ZZ, 0Y9G40Z, 0Y9G4ZZ, 0Y9H00Z, 0Y9H0ZZ, 0Y9H30Z, 0Y9H3ZZ, 0Y9H40Z, 0Y9H4ZZ, 0Y9J00Z, 0Y9J0ZZ, 0Y9J30Z, 0Y9J3ZZ, 0Y9J40Z, 0Y9J4ZZ, 0Y9K00Z, 0Y9K0ZZ, 0Y9K30Z, 0Y9K3ZZ, 0Y9K40Z, 0Y9K4ZZ, 0Y9L00Z, 0Y9L0ZZ, 0Y9L30Z, 0Y9L3ZZ, 0Y9L40Z, 0Y9L4ZZ, 0Y9M00Z, 0Y9M0ZZ, 0Y9M30Z, 0Y9M3ZZ, 0Y9M40Z, 0Y9M4ZZ, 0Y9N00Z, 0Y9N0ZZ, 0Y9N30Z, 0Y9N3ZZ, 0Y9N40Z, 0Y9N4ZZ and exclusion) **CPT procedure codes:** (10180, 11040, 11041, 11042, 11043, 11044, 11045, 11046, 11047 and exclusion)	
25. Renal Dysfunction[b]	**Secondary diagnosis codes:**	Evidence of dialysis during look back period

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	(N170, N171, N172, N178, N179, R34, R880, T8571XA, Y622, Y841, Z4901, Z4902, Z4931, Z4932, Z992) and exclusion **Secondary procedure codes:** (03130ZD, 03140ZD, 03150ZD, 03160ZD, 03170ZD, 03180ZD, 03190ZF, 031A0ZF, 031B0ZF, 031C0ZF, 03PY07Z, 03PY0JZ, 03PY0KZ, 03PY37Z, 03PY3JZ, 03PY3KZ, 03PY47Z, 03PY4JZ, 03PY4KZ, 05HY33Z, 06HY33Z, 0W1G0JY, 0W1G4JY, 3E1M39Z and exclusion) **CPT procedure codes** (90935, 90937, 90945, 90947, 90970, 90997, 90999, 4054F, 4055F and exclusion)	Principal or secondary procedure codes: Diagnosis/Status codes: I052, R880, T82818A, T82828A, T82838A, T82848A, T82858A, T82868A, T82898A, T8571XA, Y622, Y841, Z4901, Z4902, Z4931, Z4932, Z992 If Part B Medicare files are available use CPT codes: 36833, 90935, 90937, 90940, 90945, 90947, 90966, 90970, 90989, 90999, 99512, 99601, 4051F, 4052F, 4053F, 4054F, 4055F
26. Gangrene/Amputation[b]	**Secondary diagnosis codes:** E0852, E0952, E1052, E1152, E1352, I70361, I70362, I70363, I70368, I70369, I70461, I70462, I70463, I70468, I70469, I70561, I70562, I70563, I70568, I70569, I70661, I70662, I70663, I70668, I70669, I70761, I70762, I70763, I70768, I70769, I7301, I96, M726 **Secondary procedure codes:** (0X600ZZ, 0X610ZZ, 0X620ZZ, 0X630ZZ, 0X680Z1, 0X680Z2, 0X680Z3, 0X690Z1, 0X690Z2, 0X690Z3, 0X6B0ZZ, 0X6C0ZZ, 0X6D0Z1, 0X6D0Z2, 0X6D0Z3, 0X6F0Z1, 0X6F0Z2, 0X6F0Z3, 0X6J0Z0, 0X6J0Z4, 0X6J0Z5, 0X6J0Z6, 0X6J0Z7, 0X6J0Z8, 0X6J0Z9, 0X6J0ZB, 0X6J0ZC, 0X6J0ZD, 0X6J0ZF, 0X6K0Z0, 0X6K0Z4, 0X6K0Z5, 0X6K0Z6, 0X6K0Z7, 0X6K0Z8, 0X6K0Z9, 0X6K0ZB, 0X6K0ZC, 0X6K0ZD, 0X6K0ZF, 0X6L0Z0, 0X6L0Z1, 0X6L0Z2, 0X6L0Z3, 0X6M0Z0, 0X6M0Z1, 0X6M0Z2, 0X6M0Z3, 0X6N0Z0, 0X6N0Z1, 0X6N0Z2, 0X6N0Z3, 0X6P0Z0, 0X6P0Z1, 0X6P0Z2, 0X6P0Z3, 0X6Q0Z0, 0X6Q0Z1, 0X6Q0Z2, 0X6Q0Z3, 0X6R0Z0, 0X6R0Z1, 0X6R0Z2, 0X6R0Z3, 0X6S0Z0, 0X6S0Z1, 0X6S0Z2, 0X6S0Z3, 0X6T0Z0, 0X6T0Z1, 0X6T0Z2, 0X6T0Z3, 0X6V0Z0, 0X6V0Z1, 0X6V0Z2, 0X6V0Z3, 0X6W0Z0, 0X6W0Z1, 0X6W0Z2, 0X6W0Z3, 0Y620ZZ, 0Y630ZZ, 0Y640ZZ, 0Y670ZZ, 0Y680ZZ, 0Y6C0Z1, 0Y6C0Z2, 0Y6C0Z3, 0Y6D0Z1, 0Y6D0Z2, 0Y6D0Z3, 0Y6F0ZZ, 0Y6G0ZZ, 0Y6H0Z1, 0Y6H0Z2,	**Principal procedure codes**: 0X600ZZ, 0X610ZZ, 0X620ZZ, 0X630ZZ, 0X680Z1, 0X680Z2, 0X680Z3, 0X690Z1, 0X690Z2, 0X690Z3, 0X6B0ZZ, 0X6C0ZZ, 0X6D0Z1, 0X6D0Z2, 0X6D0Z3, 0X6F0Z1, 0X6F0Z2, 0X6F0Z3, 0X6J0Z0, 0X6J0Z4, 0X6J0Z5, 0X6J0Z6, 0X6J0Z7, 0X6J0Z8, 0X6J0Z9, 0X6J0ZB, 0X6J0ZC, 0X6J0ZD, 0X6J0ZF, 0X6K0Z0, 0X6K0Z4, 0X6K0Z5, 0X6K0Z6, 0X6K0Z7, 0X6K0Z8, 0X6K0Z9, 0X6K0ZB, 0X6K0ZC, 0X6K0ZD, 0X6K0ZF, 0X6L0Z0, 0X6L0Z1, 0X6L0Z2, 0X6L0Z3, 0X6M0Z0, 0X6M0Z1, 0X6M0Z2, 0X6M0Z3, 0X6N0Z0, 0X6N0Z1, 0X6N0Z2, 0X6N0Z3, 0X6P0Z0, 0X6P0Z1, 0X6P0Z2, 0X6P0Z3, 0X6Q0Z0, 0X6Q0Z1, 0X6Q0Z2, 0X6Q0Z3, 0X6R0Z0, 0X6R0Z1, 0X6R0Z2, 0X6R0Z3, 0X6S0Z0, 0X6S0Z1, 0X6S0Z2, 0X6S0Z3, 0X6T0Z0, 0X6T0Z1, 0X6T0Z2, 0X6T0Z3, 0X6V0Z0, 0X6V0Z1, 0X6V0Z2, 0X6V0Z3, 0X6W0Z0, 0X6W0Z1, 0X6W0Z2, 0X6W0Z3, 0Y620ZZ, 0Y630ZZ, 0Y640ZZ, 0Y670ZZ, 0Y680ZZ, 0Y6C0Z1, 0Y6C0Z2, 0Y6C0Z3, 0Y6D0Z1, 0Y6D0Z2, 0Y6D0Z3, 0Y6F0ZZ, 0Y6G0ZZ, 0Y6H0Z1, 0Y6H0Z2, 0Y6H0Z3, 0Y6J0Z1, 0Y6J0Z2, 0Y6J0Z3, 0Y6M0Z0, 0Y6M0Z4, 0Y6M0Z5, 0Y6M0Z6, 0Y6M0Z7, 0Y6M0Z8, 0Y6M0Z9, 0Y6M0ZB, 0Y6M0ZC, 0Y6M0ZD, 0Y6M0ZF, 0Y6N0Z0, 0Y6N0Z4, 0Y6N0Z5, 0Y6N0Z6, 0Y6N0Z7, 0Y6N0Z8, 0Y6N0Z9, 0Y6N0ZB, 0Y6N0ZC, 0Y6N0ZD, 0Y6N0ZF, 0Y6P0Z0, 0Y6P0Z1, 0Y6P0Z2, 0Y6P0Z3, 0Y6Q0Z0,

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	0Y6H0Z3, 0Y6J0Z1, 0Y6J0Z2, 0Y6J0Z3, 0Y6M0Z0, 0Y6M0Z4, 0Y6M0Z5, 0Y6M0Z6, 0Y6M0Z7, 0Y6M0Z8, 0Y6M0Z9, 0Y6M0ZB, 0Y6M0ZC, 0Y6M0ZD, 0Y6M0ZF, 0Y6N0Z0, 0Y6N0Z4, 0Y6N0Z5, 0Y6N0Z6, 0Y6N0Z7, 0Y6N0Z8, 0Y6N0Z9, 0Y6N0ZB, 0Y6N0ZC, 0Y6N0ZD, 0Y6N0ZF, 0Y6P0Z0, 0Y6P0Z1, 0Y6P0Z2, 0Y6P0Z3, 0Y6Q0Z0, 0Y6Q0Z1, 0Y6Q0Z2, 0Y6Q0Z3, 0Y6R0Z0, 0Y6R0Z1, 0Y6R0Z2, 0Y6R0Z3, 0Y6S0Z0, 0Y6S0Z1, 0Y6S0Z2, 0Y6S0Z3, 0Y6T0Z0, 0Y6T0Z1, 0Y6T0Z2, 0Y6T0Z3, 0Y6U0Z0, 0Y6U0Z1, 0Y6U0Z2, 0Y6U0Z3, 0Y6V0Z0, 0Y6V0Z1, 0Y6V0Z2, 0Y6V0Z3, 0Y6W0Z0, 0Y6W0Z1, 0Y6W0Z2, 0Y6W0Z3, 0Y6X0Z0, 0Y6X0Z1, 0Y6X0Z2, 0Y6X0Z3, 0Y6Y0Z0, 0Y6Y0Z1, 0Y6Y0Z2, 0Y6Y0Z3 and exclusion) **CPT procedure codes:** (23900, 23920, 24900, 24920, 24930, 24931, 24940, 25900, 25905, 25909, 25920, 25924, 25927, 25931, 26910, 26951, 26952, 27290, 27295, 27590, 27591, 27592, 27596, 27598, 27880, 27881, 27882, 27886, 27888, 27889, 28800, 28805, 28810, 28820, 28825, and exclusion)	0Y6Q0Z1, 0Y6Q0Z2, 0Y6Q0Z3, 0Y6R0Z0, 0Y6R0Z1, 0Y6R0Z2, 0Y6R0Z3, 0Y6S0Z0, 0Y6S0Z1, 0Y6S0Z2, 0Y6S0Z3, 0Y6T0Z0, 0Y6T0Z1, 0Y6T0Z2, 0Y6T0Z3, 0Y6U0Z0, 0Y6U0Z1, 0Y6U0Z2, 0Y6U0Z3, 0Y6V0Z0, 0Y6V0Z1, 0Y6V0Z2, 0Y6V0Z3, 0Y6W0Z0, 0Y6W0Z1, 0Y6W0Z2, 0Y6W0Z3, 0Y6X0Z0, 0Y6X0Z1, 0Y6X0Z2, 0Y6X0Z3, 0Y6Y0Z0, 0Y6Y0Z1, 0Y6Y0Z2, 0Y6Y0Z3
27. Intestinal Obstruction	**Secondary diagnosis codes:** (K550, K565, K5660, K913, K9181, K9186, K9189 and exclusion)	**DRG** DRG = 148-153(2004-2007) 329-331, 335-337, 344-346(2008-2009) **Principal diagnosis codes:** K50012, K50112, K50812, K50912, K550, K565, K5660
28. Return to Surgery[a]	**Secondary diagnosis codes:** T81500A, T81501A, T81502A, T81503A, T81504A, T81505A, T81506A, T81507A, T81508A, T81509A, T81510A, T81511A, T81512A, T81513A, T81514A, T81515A, T81516A, T81517A, T81518A, T81519A, T81520A, T81521A, T81522A, T81523A, T81524A, T81525A, T81526A, T81527A, T81528A, T81529A, T81530A, T81531A, T81532A, T81533A, T81534A, T81535A, T81536A, T81537A, T81538A, T81539A, T81590A, T81591A, T81592A, T81593A, T81594A, T81595A, T81596A, T81597A, T81598A, T81599A, T8160XA, T8161XA, T8169XA	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	Secondary procedure codes: 07JP0ZZ, 0B9N00Z, 0B9N0ZZ, 0B9N30Z, 0B9P00Z, 0B9P0ZZ, 0B9P30Z, 0BCN0ZZ, 0BCN3ZZ, 0BCN4ZZ, 0BCP0ZZ, 0BCP3ZZ, 0BCP4ZZ, 0BPQ00Z, 0BPQ01Z, 0BPQ02Z, 0BPQ30Z, 0BPQ31Z, 0BPQ32Z, 0BPQ40Z, 0BPQ41Z, 0BPQ42Z, 0BPQ70Z, 0BPQ71Z, 0BPQ72Z, 0BPQ80Z, 0BPQ81Z, 0BPQ82Z, 0BWQ00Z, 0BWQ02Z, 0BWQ30Z, 0BWQ32Z, 0BWQ40Z, 0BWQ42Z, 0BWQ70Z, 0BWQ72Z, 0BWQ80Z, 0BWQ82Z, 0DCS0ZZ, 0DCS3ZZ, 0DCS4ZZ, 0DCT0ZZ, 0DCT3ZZ, 0DCT4ZZ, 0DCV0ZZ, 0DCV3ZZ, 0DCV4ZZ, 0DCW0ZZ, 0DCW3ZZ, 0DCW4ZZ, 0DJ00ZZ, 0DJ60ZZ, 0DJD0ZZ, 0DJU0ZZ, 0DJV0ZZ, 0DJW0ZZ, 0FJ00ZZ, 0W190J4, 0W190JY, 0W193J4, 0W194J4, 0W194JY, 0W1B0J4, 0W1B0JY, 0W1B3J4, 0W1B4J4, 0W1B4JY, 0W390ZZ, 0W3B0ZZ, 0W3D0ZZ, 0W3G0ZZ, 0W3H0ZZ, 0W3P0ZZ, 0W3Q0ZZ, 0W9900Z, 0W990ZZ, 0W994ZZ, 0W9B00Z, 0W9B0ZZ, 0W9B4ZZ, 0WC90ZZ, 0WC93ZZ, 0WC94ZZ, 0WCB0ZZ, 0WCB3ZZ, 0WCB4ZZ, 0WCG0ZZ, 0WCG3ZZ, 0WCG4ZZ, 0WCQ0ZZ, 0WCQ3ZZ, 0WCQ4ZZ, 0WH903Z, 0WH90YZ, 0WH933Z, 0WH93YZ, 0WH943Z, 0WH94YZ, 0WHB03Z, 0WHB0YZ, 0WHB33Z, 0WHB3YZ, 0WHB43Z, 0WHB4YZ, 0WHQ03Z, 0WHQ0YZ, 0WJG0ZZ, 0WJH0ZZ, 0WJJ0ZZ, 0WJP0ZZ, 0WJR0ZZ, 0WP900Z, 0WP901Z, 0WP903Z, 0WP90JZ, 0WP90YZ, 0WP930Z, 0WP931Z, 0WP933Z, 0WP93JZ, 0WP93YZ, 0WP940Z, 0WP941Z, 0WP943Z, 0WP94JZ, 0WP94YZ, 0WPB00Z, 0WPB01Z, 0WPB03Z, 0WPB0JZ, 0WPB0YZ, 0WPB30Z, 0WPB31Z, 0WPB33Z, 0WPB3JZ, 0WPB3YZ, 0WPB40Z, 0WPB41Z, 0WPB43Z, 0WPB4JZ, 0WPB4YZ, 0WPQ01Z, 0WPQ03Z, 0WPQ0YZ, 0WW900Z, 0WW901Z, 0WW903Z, 0WW90JZ, 0WW90YZ, 0WW930Z, 0WW931Z, 0WW933Z, 0WW93JZ, 0WW93YZ, 0WW940Z, 0WW941Z, 0WW943Z, 0WW94JZ, 0WW94YZ, 0WWB00Z, 0WWB01Z,	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	0WWB03Z, 0WWB0JZ, 0WWB0YZ, 0WWB30Z, 0WWB31Z, 0WWB33Z, 0WWB3JZ, 0WWB3YZ, 0WWB40Z, 0WWB41Z, 0WWB43Z, 0WWB4JZ, 0WWB4YZ, 0WWQ01Z, 0WWQ03Z, 0WWQ0YZ **CPT procedure codes:** 32110, 32120, 32150, 49002	
29. Decubitus Ulcer[b]	**Secondary diagnosis codes:** L89000, L89001, L89002, L89003, L89004, L89009, L89010, L89011, L89012, L89013, L89014, L89019, L89020, L89021, L89022, L89023, L89024, L89029, L89100, L89101, L89102, L89103, L89104, L89109, L89110, L89111, L89112, L89113, L89114, L89119, L89120, L89121, L89122, L89123, L89124, L89129, L89130, L89131, L89132, L89133, L89134, L89139, L89140, L89141, L89142, L89143, L89144, L89149, L89150, L89151, L89152, L89153, L89154, L89159, L89200, L89201, L89202, L89203, L89204, L89209, L89210, L89211, L89212, L89213, L89214, L89219, L89220, L89221, L89222, L89223, L89224, L89229, L89300, L89301, L89302, L89303, L89304, L89309, L89310, L89311, L89312, L89313, L89314, L89319, L89320, L89321, L89322, L89323, L89324, L89329, L8940, L8941, L8942, L8943, L8944, L8945, L89500, L89501, L89502, L89503, L89504, L89509, L89510, L89511, L89512, L89513, L89514, L89519, L89520, L89521, L89522, L89523, L89524, L89529, L89600, L89601, L89602, L89603, L89604, L89609, L89610, L89611, L89612, L89613, L89614, L89619, L89620, L89621, L89622, L89623, L89624, L89629, L89810, L89811, L89812, L89813, L89814, L89819, L89890, L89891, L89892, L89893, L89894, L89899, L8990, L8991, L8992, L8993, L8994, L8995	
30. Orthopedic Complication[b]	**Secondary diagnosis codes:** (M96621, M96622, M96629, M96631, M96632, M96639, M9665, M96661, M96662, M96669, M96671, M96672, M96679, M9669, T84010A, T84011A, T84012A, T84013A, T84018A, T84019A, T84020A, T84021A, T84022A, T84023A, T84028A, T84029A, T84030A, T84031A, T84032A, T84033A, T84038A, T84039A, T84040A, T84041A, T84042A, T84043A, T84048A, T84049A, T84050A, T84051A, T84052A, T84053A, T84058A, T84059A, T84060A, T84061A, T84062A, T84063A,	**Principal procedure codes:** 0QPD0JZ, 0QPD3JZ, 0QPD4JZ, 0QPF0JZ, 0QPF3JZ, 0QPF4JZ, 0QRD0JZ, 0QRD3JZ, 0QRD4JZ, 0QRF0JZ, 0QRF3JZ, 0QRF4JZ, 0QUD0JZ, 0QUD3JZ, 0QUD4JZ, 0QUF0JZ, 0QUF3JZ, 0QUF4JZ, 0RQE0ZZ, 0RQE3ZZ, 0RQE4ZZ, 0RQEXZZ, 0RQF0ZZ, 0RQF3ZZ, 0RQF4ZZ, 0RQFXZZ, 0RQG0ZZ, 0RQG3ZZ, 0RQG4ZZ, 0RQGXZZ, 0RQH0ZZ, 0RQH3ZZ, 0RQH4ZZ, 0RQHXZZ, 0RQJ0ZZ, 0RQJ3ZZ, 0RQJ4ZZ, 0RQJXZZ, 0RQK0ZZ,

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	T84068A, T84069A, T84090A, T84091A, T84092A, T84093A, T84098A, T84099A, T84110A, T84111A, T84112A, T84113A, T84114A, T84115A, T84116A, T84117A, T84119A, T84120A, T84121A, T84122A, T84123A, T84124A, T84125A, T84126A, T84127A, T84129A, T84190A, T84191A, T84192A, T84193A, T84194A, T84195A, T84196A, T84197A, T84199A, T84210A, T84213A, T84216A, T84218A, T84220A, T84223A, T84226A, T84228A, T84290A, T84293A, T84296A, T84298A, T84310A, T84318A, T84320A, T84328A, T84390A, T84398A, T84410A, T84418A, T84420A, T84428A, T84490A, T84498A, T8450XA, T8451XA, T8452XA, T8453XA, T8454XA, T8459XA, T8481XA, T8482XA, T8483XA, T8484XA, T8485XA, T8486XA, T8489XA, T849XXA and exclusion) **Secondary procedure codes:** (0RSE34Z, 0RSE3ZZ, 0RSE44Z, 0RSE4ZZ, 0RSEX4Z, 0RSEXZZ, 0RSF34Z, 0RSF3ZZ, 0RSF44Z, 0RSF4ZZ, 0RSFX4Z, 0RSFXZZ, 0RSG34Z, 0RSG3ZZ, 0RSG44Z, 0RSG4ZZ, 0RSGX4Z, 0RSGXZZ, 0RSH34Z, 0RSH3ZZ, 0RSH44Z, 0RSH4ZZ, 0RSHX4Z, 0RSHXZZ, 0RSJ34Z, 0RSJ3ZZ, 0RSJ44Z, 0RSJ4ZZ, 0RSJX4Z, 0RSJXZZ, 0RSK34Z, 0RSK3ZZ, 0RSK44Z, 0RSK4ZZ, 0RSKX4Z, 0RSKXZZ, 0SS934Z, 0SS935Z, 0SS93ZZ, 0SS944Z, 0SS945Z, 0SS94ZZ, 0SS9X4Z, 0SS9X5Z, 0SS9XZZ, 0SSB34Z, 0SSB35Z, 0SSB3ZZ, 0SSB44Z, 0SSB45Z, 0SSB4ZZ, 0SSBX4Z, 0SSBX5Z, 0SSBXZZ, 0SSC34Z, 0SSC35Z, 0SSC3ZZ, 0SSC44Z, 0SSC45Z, 0SSC4ZZ, 0SSCX4Z, 0SSCX5Z, 0SSCXZZ, 0SSD34Z, 0SSD35Z, 0SSD3ZZ, 0SSD44Z, 0SSD45Z, 0SSD4ZZ, 0SSDX4Z, 0SSDX5Z, 0SSDXZZ) or (0PP004Z, 0PP034Z, 0PP044Z, 0PP104Z, 0PP134Z, 0PP144Z, 0PP204Z, 0PP234Z, 0PP244Z, 0PP304Z, 0PP307Z, 0PP30JZ, 0PP30KZ, 0PP334Z, 0PP337Z, 0PP33JZ, 0PP33KZ, 0PP344Z, 0PP347Z, 0PP34JZ, 0PP34KZ, 0PP404Z, 0PP407Z, 0PP40JZ, 0PP40KZ, 0PP434Z, 0PP437Z, 0PP43JZ, 0PP43KZ, 0PP444Z, 0PP447Z, 0PP44JZ, 0PP44KZ, 0PP504Z, 0PP534Z, 0PP544Z, 0PP604Z, 0PP634Z,	0RQK3ZZ, 0RQK4ZZ, 0RQKXZZ, 0RQL0ZZ, 0RQL3ZZ, 0RQL4ZZ, 0RQLXZZ, 0RQM0ZZ, 0RQM3ZZ, 0RQM4ZZ, 0RQMXZZ, 0RUE07Z, 0RUE0JZ, 0RUE0KZ, 0RUE37Z, 0RUE3JZ, 0RUE3KZ, 0RUE47Z, 0RUE4JZ, 0RUE4KZ, 0RUF07Z, 0RUF0JZ, 0RUF0KZ, 0RUF37Z, 0RUF3JZ, 0RUF3KZ, 0RUF47Z, 0RUF4JZ, 0RUF4KZ, 0RUG07Z, 0RUG0JZ, 0RUG0KZ, 0RUG37Z, 0RUG3JZ, 0RUG3KZ, 0RUG47Z, 0RUG4JZ, 0RUG4KZ, 0RUH07Z, 0RUH0JZ, 0RUH0KZ, 0RUH37Z, 0RUH3JZ, 0RUH3KZ, 0RUH47Z, 0RUH4JZ, 0RUH4KZ, 0RUJ07Z, 0RUJ0JZ, 0RUJ0KZ, 0RUJ37Z, 0RUJ3JZ, 0RUJ3KZ, 0RUJ47Z, 0RUJ4JZ, 0RUJ4KZ, 0RUK07Z, 0RUK0JZ, 0RUK0KZ, 0RUK37Z, 0RUK3JZ, 0RUK3KZ, 0RUK47Z, 0RUK4JZ, 0RUK4KZ, 0RUL07Z, 0RUL0JZ, 0RUL0KZ, 0RUL37Z, 0RUL3JZ, 0RUL3KZ, 0RUL47Z, 0RUL4JZ, 0RUL4KZ, 0RUM07Z, 0RUM0JZ, 0RUM0KZ, 0RUM37Z, 0RUM3JZ, 0RUM3KZ, 0RUM47Z, 0RUM4JZ, 0RUM4KZ, 0SP909Z, 0SP90JZ, 0SPB09Z, 0SPB0JZ, 0SPC09Z, 0SPC0JZ, 0SPC4JZ, 0SPD09Z, 0SPD0JZ, 0SPD4JZ, 0SR9019, 0SR901A, 0SR901Z, 0SR9029, 0SR902A, 0SR902Z, 0SR9039, 0SR903A, 0SR903Z, 0SR9049, 0SR904A, 0SR904Z, 0SR90J9, 0SR90JA, 0SR90JZ, 0SRA009, 0SRA00A, 0SRA00Z, 0SRA019, 0SRA01A, 0SRA01Z, 0SRA039, 0SRA03A, 0SRA03Z, 0SRA0J9, 0SRA0JA, 0SRA0JZ, 0SRB019, 0SRB01A, 0SRB01Z, 0SRB029, 0SRB02A, 0SRB02Z, 0SRB039, 0SRB03A, 0SRB03Z, 0SRB049, 0SRB04A, 0SRB04Z, 0SRB0J9, 0SRB0JA, 0SRB0JZ, 0SRC0JZ, 0SRD0JZ, 0SRE009, 0SRE00A, 0SRE00Z, 0SRE019, 0SRE01A, 0SRE01Z, 0SRE039, 0SRE03A, 0SRE03Z, 0SRE0J9, 0SRE0JA, 0SRE0JZ, 0SRR019, 0SRR01A, 0SRR01Z, 0SRR039, 0SRR03A, 0SRR03Z, 0SRR0J9, 0SRR0JA, 0SRR0JZ, 0SRS019, 0SRS01A, 0SRS01Z, 0SRS039, 0SRS03A, 0SRS03Z, 0SRS0J9, 0SRS0JA, 0SRS0JZ, 0SRT0JZ, 0SRU0JZ, 0SRV0JZ, 0SRW0JZ, 0SU909Z, 0SUA09Z, 0SUB09Z, 0SUC09C, 0SUC0JZ, 0SUC4JZ, 0SUD09C, 0SUD0JZ, 0SUD4JZ, 0SUE09Z, 0SUR09Z, 0SUS09Z,

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	0PP644Z, 0PP904Z, 0PP934Z, 0PP944Z, 0PPB04Z, 0PPB34Z, 0PPB44Z, 0PPC04Z, 0PPC05Z, 0PPC34Z, 0PPC35Z, 0PPC44Z, 0PPC45Z, 0PPD04Z, 0PPD05Z, 0PPD34Z, 0PPD35Z, 0PPD44Z, 0PPD45Z, 0PPF04Z, 0PPF05Z, 0PPF34Z, 0PPF35Z, 0PPF44Z, 0PPF45Z, 0PPG04Z, 0PPG05Z, 0PPG34Z, 0PPG35Z, 0PPG44Z, 0PPG45Z, 0PPH04Z, 0PPH05Z, 0PPH34Z, 0PPH35Z, 0PPH44Z, 0PPH45Z, 0PPJ04Z, 0PPJ05Z, 0PPJ34Z, 0PPJ35Z, 0PPJ44Z, 0PPJ45Z, 0PPK04Z, 0PPK05Z, 0PPK34Z, 0PPK35Z, 0PPK44Z, 0PPK45Z, 0PPL04Z, 0PPL05Z, 0PPL34Z, 0PPL35Z, 0PPL44Z, 0PPL45Z, 0PPM04Z, 0PPM05Z, 0PPM34Z, 0PPM35Z, 0PPM44Z, 0PPM45Z, 0PPN04Z, 0PPN05Z, 0PPN34Z, 0PPN35Z, 0PPN44Z, 0PPN45Z, 0PPP04Z, 0PPP05Z, 0PPP34Z, 0PPP35Z, 0PPP44Z, 0PPP45Z, 0PPQ04Z, 0PPQ05Z, 0PPQ34Z, 0PPQ35Z, 0PPQ44Z, 0PPQ45Z, 0PPR04Z, 0PPR05Z, 0PPR07Z, 0PPR0JZ, 0PPR0KZ, 0PPR34Z, 0PPR35Z, 0PPR37Z, 0PPR3JZ, 0PPR3KZ, 0PPR44Z, 0PPR45Z, 0PPR47Z, 0PPR4JZ, 0PPR4KZ, 0PPS04Z, 0PPS05Z, 0PPS07Z, 0PPS0JZ, 0PPS0KZ, 0PPS34Z, 0PPS35Z, 0PPS37Z, 0PPS3JZ, 0PPS3KZ, 0PPS44Z, 0PPS45Z, 0PPS47Z, 0PPS4JZ, 0PPS4KZ, 0PPT04Z, 0PPT05Z, 0PPT07Z, 0PPT0JZ, 0PPT0KZ, 0PPT34Z, 0PPT35Z, 0PPT37Z, 0PPT3JZ, 0PPT3KZ, 0PPT44Z, 0PPT45Z, 0PPT47Z, 0PPT4JZ, 0PPT4KZ, 0PPV04Z, 0PPV05Z, 0PPV07Z, 0PPV0JZ, 0PPV0KZ, 0PPV34Z, 0PPV35Z, 0PPV37Z, 0PPV3JZ, 0PPV3KZ, 0PPV44Z, 0PPV45Z, 0PPV47Z, 0PPV4JZ, 0PPV4KZ, 0PPY00Z, 0PPY0MZ, 0PPY30Z, 0PPY3MZ, 0PPY40Z, 0PPY4MZ, 0QP004Z, 0QP007Z, 0QP00JZ, 0QP00KZ, 0QP034Z, 0QP037Z, 0QP03JZ, 0QP03KZ, 0QP044Z, 0QP047Z, 0QP04JZ, 0QP04KZ, 0QP104Z, 0QP107Z, 0QP10JZ, 0QP10KZ, 0QP134Z, 0QP137Z, 0QP13JZ, 0QP13KZ, 0QP144Z, 0QP147Z, 0QP14JZ, 0QP14KZ, 0QP204Z, 0QP205Z, 0QP207Z, 0QP20JZ, 0QP20KZ, 0QP234Z, 0QP235Z, 0QP237Z, 0QP23JZ, 0QP23KZ, 0QP244Z, 0QP245Z, 0QP247Z, 0QP24JZ, 0QP24KZ, 0QP304Z, 0QP305Z, 0QP307Z, 0QP30JZ, 0QP30KZ, 0QP334Z, 0QP335Z, 0QP337Z, 0QP33JZ, 0QP33KZ, 0QP344Z, 0QP345Z, 0QP347Z, 0QP34JZ, 0QP34KZ, 0QP404Z, 0QP407Z, 0QP40JZ, 0QP40KZ, 0QP434Z, 0QP437Z, 0QP43JZ, 0QP43KZ, 0QP444Z,	0SUT09Z, 0SUU09Z, 0SUV09Z, 0SUW09Z, 0SW90JZ, 0SW93JZ, 0SW94JZ, 0SWB0JZ, 0SWB3JZ, 0SWB4JZ, 0SWC0JZ, 0SWC3JZ, 0SWC4JZ, 0SWD0JZ, 0SWD3JZ, 0SWD4JZ, 0SWF0JZ, 0SWF3JZ, 0SWF4JZ, 0SWG0JZ, 0SWG3JZ, 0SWG4JZ, 0SWH0JZ, 0SWH3JZ, 0SWH4JZ, 0SWJ0JZ, 0SWJ3JZ, 0SWJ4JZ, 0SWK0JZ, 0SWK3JZ, 0SWK4JZ, 0SWL0JZ, 0SWL3JZ, 0SWL4JZ, 0SWM0JZ, 0SWM3JZ, 0SWM4JZ, 0SWN0JZ, 0SWN3JZ, 0SWN4JZ, 0SWP0JZ, 0SWP3JZ, 0SWP4JZ, 0SWQ0JZ, 0SWQ3JZ, 0SWQ4JZ

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	0QP447Z, 0QP44JZ, 0QP44KZ, 0QP504Z, 0QP507Z, 0QP50JZ, 0QP50KZ, 0QP534Z, 0QP537Z, 0QP53JZ, 0QP53KZ, 0QP544Z, 0QP547Z, 0QP54JZ, 0QP54KZ, 0QP604Z, 0QP605Z, 0QP634Z, 0QP635Z, 0QP644Z, 0QP645Z, 0QP704Z, 0QP705Z, 0QP734Z, 0QP735Z, 0QP744Z, 0QP745Z, 0QP804Z, 0QP805Z, 0QP834Z, 0QP835Z, 0QP844Z, 0QP845Z, 0QP904Z, 0QP905Z, 0QP934Z, 0QP935Z, 0QP944Z, 0QP945Z, 0QPB04Z, 0QPB05Z, 0QPB34Z, 0QPB35Z, 0QPB44Z, 0QPB45Z, 0QPC04Z, 0QPC05Z, 0QPC34Z, 0QPC35Z, 0QPC44Z, 0QPC45Z, 0QPD04Z, 0QPD05Z, 0QPD34Z, 0QPD35Z, 0QPD44Z, 0QPD45Z, 0QPF04Z, 0QPF05Z, 0QPF34Z, 0QPF35Z, 0QPF44Z, 0QPF45Z, 0QPG04Z, 0QPG05Z, 0QPG34Z, 0QPG35Z, 0QPG44Z, 0QPG45Z, 0QPH04Z, 0QPH05Z, 0QPH34Z, 0QPH35Z, 0QPH44Z, 0QPH45Z, 0QPJ04Z, 0QPJ05Z, 0QPJ34Z, 0QPJ35Z, 0QPJ44Z, 0QPJ45Z, 0QPK04Z, 0QPK05Z, 0QPK34Z, 0QPK35Z, 0QPK44Z, 0QPK45Z, 0QPL04Z, 0QPL05Z, 0QPL34Z, 0QPL35Z, 0QPL44Z, 0QPL45Z, 0QPM04Z, 0QPM05Z, 0QPM34Z, 0QPM35Z, 0QPM44Z, 0QPM45Z, 0QPN04Z, 0QPN05Z, 0QPN34Z, 0QPN35Z, 0QPN44Z, 0QPN45Z, 0QPP04Z, 0QPP05Z, 0QPP34Z, 0QPP35Z, 0QPP44Z, 0QPP45Z, 0QPQ04Z, 0QPQ05Z, 0QPQ07Z, 0QPQ0JZ, 0QPQ0KZ, 0QPQ34Z, 0QPQ35Z, 0QPQ37Z, 0QPQ3JZ, 0QPQ3KZ, 0QPQ44Z, 0QPQ45Z, 0QPQ47Z, 0QPQ4JZ, 0QPQ4KZ, 0QPR04Z, 0QPR05Z, 0QPR07Z, 0QPR0JZ, 0QPR0KZ, 0QPR34Z, 0QPR35Z, 0QPR37Z, 0QPR3JZ, 0QPR3KZ, 0QPR44Z, 0QPR45Z, 0QPR47Z, 0QPR4JZ, 0QPR4KZ, 0QPS04Z, 0QPS07Z, 0QPS0JZ, 0QPS0KZ, 0QPS34Z, 0QPS37Z, 0QPS3JZ, 0QPS3KZ, 0QPS44Z, 0QPS47Z, 0QPS4JZ, 0QPS4KZ, 0QPY00Z, 0QPY0MZ, 0QPY30Z, 0QPY3MZ, 0QPY40Z, 0QPY4MZ and exclusion)	
31. Compartment Syndrome[b]	**Secondary diagnosis codes:** M622, T796

CPT procedure codes: | |

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	27025, 27305, 27496, 27497, 27498, 27499, 27600, 27601, 27602, 27892, 27893, 27894, 28008, 29893	
32. Hepatitis/Jaundice	**Secondary diagnosis codes:** K710, K7110, K7111, K712, K713, K714, K7150, K7151, K716, K717, K718, K719, K7200, K7201, K752, K753, K7581, K7589, K759, K762, K764	
33. Pancreatitis	**Secondary diagnosis codes:** B252, K850, K851, K853, K858, K859	
34. Necrosis of the Bone-Thermal or Aseptic	**Secondary diagnosis codes:** M8700, M87011, M87012, M87019, M87021, M87022, M87029, M87031, M87032, M87033, M87034, M87035, M87036, M87037, M87038, M87039, M87041, M87042, M87043, M87044, M87045, M87046, M87050, M87051, M87052, M87059, M87061, M87062, M87063, M87064, M87065, M87066, M87071, M87072, M87073, M87074, M87075, M87076, M87077, M87078, M87079, M8708, M8709, M8710, M87111, M87112, M87119, M87121, M87122, M87129, M87131, M87132, M87133, M87134, M87135, M87136, M87137, M87138, M87139, M87141, M87142, M87143, M87144, M87145, M87146, M87150, M87151, M87152, M87159, M87161, M87162, M87163, M87164, M87165, M87166, M87171, M87172, M87173, M87174, M87175, M87176, M87177, M87178, M87179, M87180, M87188, M8719, M8720, M87221, M87222, M87229, M87251, M87252, M87256, M87274, M87275, M87276, M8730, M87311, M87312, M87319, M87321, M87322, M87329, M87331, M87332, M87333, M87334, M87335, M87336, M87337, M87338, M87339, M87341, M87342, M87343, M87344, M87345, M87346, M87350, M87351, M87352, M87353, M87361, M87362, M87363, M87364, M87365, M87366, M87371, M87372, M87373, M87374, M87375, M87376, M87377, M87378, M87379, M8738, M8739, M8780, M87811, M87812, M87819, M87821, M87822, M87829, M87831, M87832, M87833, M87834, M87835, M87836, M87837, M87838, M87839, M87841, M87842, M87843, M87844, M87845, M87849, M87850, M87851, M87852, M87859, M87861, M87862, M87863, M87864,	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	M87865, M87869, M87871, M87872, M87873, M87874, M87875, M87876, M87877, M87878, M87879, M8788, M8789, M879, M9050, M90511, M90512, M90519, M90521, M90522, M90529, M90531, M90532, M90539, M90541, M90542, M90549, M90551, M90552, M90559, M90561, M90562, M90569, M90571, M90572, M90579, M9058, M9059	
35. Osteomyelitis[b]	**Secondary diagnosis codes:** (M4620, M4621, M4622, M4623, M4624, M4625, M4626, M4627, M4628, M8600, M86011, M86012, M86019, M86021, M86022, M86029, M86031, M86032, M86039, M86041, M86042, M86049, M86051, M86052, M86059, M86061, M86062, M86069, M86071, M86072, M86079, M8608, M8609, M8610, M86111, M86112, M86119, M86121, M86122, M86129, M86131, M86132, M86139, M86141, M86142, M86149, M86151, M86152, M86159, M86161, M86162, M86169, M86171, M86172, M86179, M8618, M8619, M8620, M86211, M86212, M86219, M86221, M86222, M86229, M86231, M86232, M86239, M86241, M86242, M86249, M86251, M86252, M86259, M86261, M86262, M86269, M86271, M86272, M86279, M8628, M8629, M869, T8460XA, T84610A, T84611A, T84612A, T84613A, T84614A, T84615A, T84619A, T84620A, T84621A, T84622A, T84623A, T84624A, T84625A, T84629A, T8463XA, T8469XA, T847XXA and exclusion) **CPT procedure codes:** 23035, 23170, 23172, 23174, 23180, 23182, 23184, 24134, 24136, 24138, 24140, 24145, 24147, 26992, 27070, 27071, 27303, 27360, 27607, 27640, 27641, 28005, 28120, 28122, 28124	**Primary diagnosis codes:** M4620, M4621, M4622, M4623, M4624, M4625, M4626, M4627, M4628, M8600, M86011, M86012, M86019, M86021, M86022, M86029, M86031, M86032, M86039, M86041, M86042, M86049, M86051, M86052, M86059, M86061, M86062, M86069, M86071, M86072, M86079, M8608, M8609, M8610, M86111, M86112, M86119, M86121, M86122, M86129, M86131, M86132, M86139, M86141, M86142, M86149, M86151, M86152, M86159, M86161, M86162, M86169, M86171, M86172, M86179, M8618, M8619, M8620, M86211, M86212, M86219, M86221, M86222, M86229, M86231, M86232, M86239, M86241, M86242, M86249, M86251, M86252, M86259, M86261, M86262, M86269, M86271, M86272, M86279, M8628, M8629, M869, T8460XA, T84610A, T84611A, T84612A, T84613A, T84614A, T84615A, T84619A, T84620A, T84621A, T84622A, T84623A, T84624A, T84625A, T84629A, T8463XA, T8469XA, T847XXA
36. Disseminated Intravascular Coagulopathy (DIC)	**Secondary diagnosis codes:** D65	
37. Pyelonephritis	**Secondary diagnosis codes:** N10, N12, N136, N151, N159, N16, N2884, N2885, N2886	
38. Post-Surgical Complication	**Secondary diagnosis codes:** E368, G972, G9781, G9782, H59021, H59022, H59023, H59029, J955, L7681, L7682, M02211, M02212, M02219,	

APPENDIX D: Definitions of complications used to create the Failure-to-Rescue (FTR) measure (†)
(Unless otherwise specified, all diagnosis and procedure codes are secondary codes) (ICD-10)

	Inclusion criteria	Exclusion criteria as indicated next to inclusion
	M02221, M02222, M02229, M02231, M02232, M02239, M02241, M02242, M02249, M02251, M02252, M02259, M02261, M02262, M02269, M02271, M02272, M02279, M0228, M0229, N980, N990, N99520, N99521, N99522, N99528, N99530, N99531, N99532, N99538, N9981, N9989, T800XXA, T801XXA, T80211A, T80212A, T80218A, T80219A, T8022XA, T8029XA, T8030XA, T80310A, T80311A, T80319A, T8039XA, T8040XA, T80410A, T80411A, T80419A, T8049XA, T8051XA, T8052XA, T8059XA, T8061XA, T8062XA, T8069XA, T80810A, T80818A, T8089XA, T8090XA, T80910A, T80911A, T80919A, T8092XA, T80A0XA, T80A10A, T80A11A, T80A19A, T80A9XA, T814XXA, T81718A, T81719A, T8172XA, T8181XA, T8182XA, T8189XA, T819XXA, T880XXA, T881XXA, T884XXA, T887XXA, T888XXA, T889XXA	

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

Heart Failure
Look-back Period
I0981, I110, I130, I132, I501, I5020, I5021, I5022, I5023, I5030, I5031, I5032, I5033, I5040, I5041, I5042, I5043, I509, J810

Current Admission
I501, I5020, I5021, I5022, I5023, I5030, I5031, I5032, I5033, I5040, I5041, I5042, I5043, I509, J810

Stroke
Look-back Period
G9731, G9732, I610, I611, I612, I613, I614, I615, I616, I618, I619, I6300, I63011, I63012, I63019, I6302, I63031, I63032, I63039, I6309, I6310, I63111, I63112, I63119, I6312, I63131, I63132, I63139, I6319, I6320, I63211, I63212, I63219, I6322, I63231, I63232, I63239, I6329, I6330, I63311, I63312, I63319, I63321, I63322, I63329, I63331, I63332, I63339, I63341, I63342, I63349, I6339, I6340, I63411, I63412, I63419, I63421, I63422, I63429, I63431, I63432, I63439, I63441, I63442, I63449, I6349, I6350, I63511, I63512, I63519, I63521, I63522, I63529, I63531, I63532, I63539, I63541, I63542, I63549, I6359, I636, I638, I639, I6789, I6900, I6901, I69020, I69021, I69022, I69023, I69028, I69031, I69032, I69033, I69034, I69039, I69041, I69042, I69043, I69044, I69049, I69051, I69052, I69053, I69054, I69059, I69061, I69062, I69063, I69064, I69065, I69069, I69090, I69091, I69092, I69093, I69098, I6910, I6911, I69120, I69121, I69122, I69123, I69128, I69131, I69132, I69133, I69134, I69139, I69141, I69142, I69143, I69144, I69149, I69151, I69152, I69153, I69154, I69159, I69161, I69162, I69163, I69164, I69165, I69169, I69190, I69191, I69192, I69193, I69198, I6920, I6921, I69220, I69221, I69222, I69223, I69228, I69231, I69232, I69233, I69234, I69239, I69241, I69242, I69243, I69244, I69249, I69251, I69252, I69253, I69254, I69259, I69261, I69262, I69263, I69264, I69265, I69269, I69290, I69291, I69292, I69293, I69298, I6930, I6931, I69320, I69321, I69322, I69323, I69328, I69331, I69332, I69333, I69334, I69339, I69341, I69342, I69343, I69344, I69349, I69351, I69352, I69353, I69354, I69359, I69361, I69362, I69363, I69364, I69365, I69369, I69390, I69391, I69392, I69393, I69398, I6980, I6981, I69820, I69821, I69822, I69823, I69828, I69831, I69832, I69833, I69834, I69839, I69841, I69842, I69843, I69844, I69849, I69851, I69852, I69853, I69854, I69859, I69861, I69862, I69863, I69864, I69865, I69869, I69890, I69891, I69892, I69893, I69898, I6990, I6991, I69920, I69921, I69922, I69923, I69928, I69931, I69932, I69933, I69934, I69939, I69941, I69942, I69943, I69944, I69949, I69951, I69952, I69953, I69954, I69959, I69961, I69962, I69963, I69964, I69965, I69969, I69990, I69991, I69992, I69993, I69998, I97810, I97811, I97820, I97821, Z8673, Z8674, Z8679

Current Admission
I6900, I6901, I69020, I69021, I69022, I69023, I69028, I69031, I69032, I69033, I69034, I69039, I69041, I69042, I69043, I69044, I69049, I69051, I69052, I69053, I69054, I69059, I69061, I69062, I69063, I69064, I69065, I69069, I69090, I69091, I69098, I6910, I6911, I69120, I69121, I69122, I69123, I69128, I69131, I69132, I69133, I69134, I69139, I69141, I69142, I69143, I69144, I69149, I69151, I69152, I69153, I69154, I69159, I69161, I69162, I69163, I69164, I69165, I69169, I69190, I69191, I69198, I6920, I6921, I69220, I69221, I69222, I69223, I69228, I69231, I69232, I69233, I69234, I69239, I69241, I69242, I69243, I69244, I69249, I69251, I69252, I69253, I69254, I69259, I69261, I69262, I69263, I69264, I69265, I69269, I69290,

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

I69291, I69298, I6930, I6931, I69320, I69321, I69322, I69323, I69328, I69331, I69332, I69333, I69334, I69339, I69341, I69342, I69343, I69344, I69349, I69351, I69352, I69353, I69354, I69359, I69361, I69362, I69363, I69364, I69365, I69369, I69390, I69391, I69398, I6980, I6981, I69820, I69821, I69822, I69823, I69828, I69831, I69832, I69833, I69834, I69839, I69841, I69842, I69843, I69844, I69849, I69851, I69852, I69853, I69854, I69859, I69861, I69862, I69863, I69864, I69865, I69869, I69890, I69891, I69898, I6990, I6991, I69920, I69921, I69922, I69923, I69928, I69931, I69932, I69933, I69934, I69939, I69941, I69942, I69943, I69944, I69949, I69951, I69952, I69953, I69954, I69959, I69961, I69962, I69963, I69964, I69965, I69969, I69990, I69991, I69998, Z8673, Z8674, Z8679

Seizures
Look-back Period
G40001, G40009, G40011, G40019, G40101, G40109, G40111, G40119, G40201, G40209, G40211, G40219, G40301, G40309, G40311, G40319, G40401, G40409, G40411, G40419, G40501, G40509, G40801, G40802, G40803, G40804, G40811, G40812, G40813, G40814, G4089, G40901, G40909, G40911, G40919, G40A01, G40A09, G40A11, G40A19, G40B01, G40B09, G40B11, G40B19

Current Admission
G40001, G40009, G40011, G40019, G40101, G40109, G40111, G40119, G40201, G40209, G40211, G40219, G40301, G40309, G40311, G40319, G40401, G40409, G40411, G40419, G40501, G40509, G40801, G40802, G40803, G40804, G40811, G40812, G40813, G40814, G4089, G40901, G40909, G40911, G40919, G40A01, G40A09, G40A11, G40A19, G40B01, G40B09, G40B11, G40B19

Dementias
Look-back Period or Current Admission
F0150, F0151, F0280, F0281, F0390, F0391, F04, F05, F060, F061, F068, F070, G132, G138, G230, G231, G232, G238, G239, G300, G301, G308, G309, G3101, G3109, G311, G312, G3183, G3185, G3189, G319, G903, G914, G94, R4181, R54

Alcoholism
Look-back Period or Current Admission
F1010, F10120, F10121, F10129, F1014, F10150, F10159, F10180, F10181, F10182, F10188, F1019, F1020, F1021, F10220, F10221, F10229, F10230, F10231, F10232, F10239, F1024, F10250, F10259, F1026, F1027, F10280, F10281, F10282, F10288, F1029, F10920, F10921, F10929, F1094, F10950, F10959, F1096, F1097, F10980, F10981, F10982, F10988, F1099

Drug Abuse
Look-back Period or Current Admission
F1110, F11120, F11122, F11129, F1114, F11159, F11181, F11182, F11188, F1119, F1120, F1121, F11220, F11221, F11222, F11229, F1123, F1124, F11250, F11251, F11259, F11281, F11282, F11288, F1129, F1190, F11922, F1193, F1194, F11959, F11981, F11982, F11988, F1199, F1210, F12122, F12159, F12180, F12188, F1219, F1220, F1221, F12220, F12221, F12222, F12229, F12250, F12251, F12259, F12280, F12288, F1229, F1290, F12922, F12959, F12980, F12988, F1299, F1310, F13120, F1314, F13159, F13180, F13181, F13182, F13188,

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

F1319, F1320, F1321, F13220, F13221, F13229, F13230, F13231, F13232, F13239, F1324, F13250, F13251, F13259, F1326, F1327, F13280, F13281, F13282, F13288, F1329, F1390, F13930, F13931, F13932, F13939, F1394, F13959, F1396, F1397, F13980, F13981, F13982, F13988, F1399, F1410, F14120, F14122, F1414, F14159, F14180, F14181, F14182, F14188, F1419, F1420, F1421, F14220, F14221, F14222, F14229, F1423, F1424, F14250, F14251, F14259, F14280, F14281, F14282, F14288, F1429, F1490, F14922, F1494, F14959, F14980, F14981, F14982, F14988, F1499, F1510, F15120, F15122, F1514, F15159, F15180, F15181, F15182, F15188, F1519, F1520, F1521, F15220, F15221, F15222, F15229, F1523, F1524, F15250, F15251, F15259, F15280, F15281, F15282, F15288, F1529, F1590, F15922, F1593, F1594, F15959, F15980, F15981, F15982, F15988, F1599, F1610, F16120, F16122, F1614, F16159, F16180, F16183, F16188, F1619, F1620, F1621, F16220, F16221, F16229, F1624, F16250, F16251, F16259, F16280, F16283, F16288, F1629, F1690, F1694, F16959, F16980, F16983, F16988, F1699, F17203, F17208, F17209, F17213, F17218, F17219, F17223, F17228, F17229, F17293, F17298, F17299, F1810, F18120, F1814, F18159, F1817, F18180, F18188, F1819, F1820, F1821, F18220, F18221, F18229, F1824, F18250, F18251, F18259, F1827, F18280, F18288, F1829, F1890, F1894, F18959, F1897, F18980, F18988, F1899, F1910, F19120, F19122, F1914, F19159, F1916, F1917, F19180, F19181, F19182, F19188, F1919, F1920, F1921, F19220, F19221, F19222, F19229, F19230, F19231, F19232, F19239, F1924, F19250, F19251, F19259, F1926, F1927, F19280, F19281, F19282, F19288, F1929, F1990, F19922, F19930, F19931, F19932, F19939, F1994, F19959, F1996, F1997, F19980, F19981, F19982, F19988, F1999, F550, F551, F552, F553, F554, F558, O99320, O99321, O99322, O99323, O99324, O99325

Past MI
<u>Look-back Period</u>
I2101, I2102, I2109, I2111, I2119, I2121, I2129, I213, I214, I220, I221, I222, I228, I229, I252

<u>Current Admission</u>
I2109, I2111, I2119, I2129, I213, I214, I252

Past Arrhythmia
<u>Look-back Period</u>
I462, I468, I469, I470, I471, I472, I479, I480, I481, I482, I483, I484, I4891, I4892, I4901, I4902, I491, I492, I493, I4940, I4949, I495, I498, I499, R001

<u>Current Admission</u>
I495, I498, R001

Unstable Angina
<u>Look-back Period or Current Admission</u>
I200, I25110, I25700, I25710, I25720, I25730, I25750, I25760, I25790

Angina
<u>Look-back Period or Current Admission</u>

I201, I208, I209, I25111, I25118, I25119, I25701, I25708, I25709, I25711, I25718, I25719, I25721, I25728, I25729, I25731, I25738, I25739, I25751, I25758, I25759, I25761, I25768, I25769, I25791, I25798, I25799

Hypertension

Look-back Period or Current Admission

I10, I110, I119, I129, I130, I1310, I150, I151, I152, I158, I159, N262, O10011, O10012, O10013, O10019, O1002, O1003, O10111, O10112, O10113, O10119, O1012, O1013, O10211, O10212, O10213, O10219, O1022, O1023, O10311, O10312, O10313, O10319, O1032, O1033, O10411, O10412, O10413, O10419, O1042, O1043, O10911, O10912, O10913, O10919, O1092, O1093, O111, O112, O113, O119, O152, O161, O162, O163, O169

Valvular Disease

Look-back Period or Current Admission

A5203, I050, I051, I052, I058, I059, I060, I061, I062, I068, I069, I070, I071, I072, I078, I079, I080, I081, I082, I083, I088, I089, I091, I0989, I340, I341, I342, I348, I349, I350, I351, I352, I358, I359, I360, I361, I362, I368, I369, I370, I371, I372, I378, I379, Q230, Q231, Q232, Q233, Z952, Z953, Z954

COPD/Chronic Pulmonary Disease

Look-back Period or Current Admission

J40, J410, J411, J418, J42, J430, J431, J432, J438, J439, J440, J441, J449, J470, J471, J479, J60, J61, J620, J628, J630, J631, J632, J633, J634, J635, J636, J64, J65, J660, J661, J662, J668, J670, J671, J672, J673, J674, J675, J676, J677, J678, J679, J684

Asthma

Look-back Period or Current Admission

J440, J441, J449, J4520, J4521, J4522, J4530, J4531, J4532, J4540, J4541, J4542, J4550, J4551, J4552, J45901, J45902, J45909, J45998

Liver Disease/Dysfunction

Look-back Period or Current Admission

B180, B181, B182, B251, I8500, I8501, I8510, I8511, K700, K7010, K7011, K702, K7030, K7031, K7040, K7041, K709, K710, K7110, K7111, K712, K713, K714, K7150, K7151, K716, K717, K718, K719, K7200, K7201, K7210, K7211, K7290, K7291, K730, K731, K732, K738, K739, K740, K741, K742, K743, K744, K745, K7460, K7469, K750, K751, K752, K753, K754, K7581, K7589, K759, K760, K761, K762, K763, K764, K765, K766, K767, K7681, K7689, K769, K77, Z4823, Z944

Renal Dysfunction

Look-back Period

B520, E0821, E0822, E0829, E0921, E0922, E0929, I129, I130, I1310, M3214, M3215, M3504, N020, N021, N022, N023, N024, N025, N026, N027, N028, N029, N030, N031, N032, N033, N034, N035, N036, N037, N038, N039, N040, N041, N042, N043, N044, N045, N046, N047, N048, N049, N050, N051, N052, N053, N054, N055, N056, N057, N058, N059, N060, N061, N062, N063, N064, N065, N066, N067, N068, N069, N070, N071, N072, N073, N074, N075,

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

N076, N077, N078, N079, N08, N140, N141, N142, N143, N144, N150, N158, N159, N16, N181, N182, N183, N184, N189, N250, N251, N2581, N2589, N259

Current Admission
N170, N178, N179

Renal Failure
Look-back Period
I120, I1311, I132, N171, N172, N185, N186, N19, R880, Y622, Y841, Z4822, Z4901, Z4902, Z4931, Z4932, Z940, Z992

Current Admission
I120, I1311, I132, N171, N172, N185, N186, Z4822, Z940

Diabetes
Look-back Period or Current Admission
E0800, E0801, E0810, E0811, E0821, E0822, E0829, E08311, E08319, E08321, E08329, E08331, E08339, E08341, E08349, E08351, E08359, E0836, E0839, E0840, E0841, E0842, E0843, E0844, E0849, E0851, E0852, E0859, E08610, E08618, E08620, E08621, E08622, E08628, E08630, E08638, E08641, E08649, E0865, E0869, E088, E089, E0900, E0901, E0910, E0911, E0921, E0922, E0929, E09311, E09319, E09321, E09329, E09331, E09339, E09341, E09349, E09351, E09359, E0936, E0939, E0940, E0941, E0942, E0943, E0944, E0949, E0951, E0952, E0959, E09610, E09618, E09620, E09621, E09622, E09628, E09630, E09638, E09641, E09649, E0965, E0969, E098, E099, E1010, E1011, E1021, E1022, E1029, E10311, E10319, E10321, E10329, E10331, E10339, E10341, E10349, E10351, E10359, E1036, E1039, E1040, E1041, E1042, E1043, E1044, E1049, E1051, E1052, E1059, E10610, E10618, E10620, E10621, E10622, E10628, E10630, E10638, E10641, E10649, E1065, E1069, E108, E109, E1100, E1101, E1121, E1122, E1129, E11311, E11319, E11321, E11329, E11331, E11339, E11341, E11349, E11351, E11359, E1136, E1139, E1140, E1141, E1142, E1143, E1144, E1149, E1151, E1152, E1159, E11610, E11618, E11620, E11621, E11622, E11628, E11630, E11638, E11641, E11649, E1165, E1169, E118, E119, E1300, E1301, E1310, E1311, E1321, E1322, E1329, E13311, E13319, E13321, E13329, E13331, E13339, E13341, E13349, E13351, E13359, E1336, E1339, E1340, E1341, E1342, E1343, E1344, E1349, E1351, E1352, E1359, E13610, E13618, E13620, E13621, E13622, E13628, E13630, E13638, E13641, E13649, E1365, E1369, E138, E139, O24011, O24012, O24013, O24019, O2402, O2403, O24111, O24112, O24113, O24119, O2412, O2413, O24311, O24312, O24313, O24319, O2432, O2433, O24410, O24414, O24419, O24420, O24424, O24429, O24430, O24434, O24439, O24811, O24812, O24813, O24819, O2482, O2483, O24911, O24912, O24913, O24919, O2492, O2493, O99810, O99814, O99815, P702

Paraplegia
Look-back Period
G041, G800, G801, G802, G804, G808, G809, G8100, G8101, G8102, G8103, G8104, G8110, G8111, G8112, G8113, G8114, G8190, G8191, G8192, G8193, G8194, G8220, G8221, G8222, G8250, G8251, G8252, G8253, G8254, G830, G8310, G8311, G8312, G8313, G8314, G8320, G8321, G8322, G8323, G8324, G8330, G8331, G8332, G8333, G8334, G834, G835, G8381,

G8382, G8383, G8384, G8389, G839, I69031, I69032, I69033, I69034, I69039, I69041, I69042, I69043, I69044, I69049, I69051, I69052, I69053, I69054, I69059, I69061, I69062, I69063, I69064, I69065, I69069, I69131, I69132, I69133, I69134, I69139, I69141, I69142, I69143, I69144, I69149, I69151, I69152, I69153, I69154, I69159, I69161, I69162, I69163, I69164, I69165, I69169, I69231, I69232, I69233, I69234, I69239, I69241, I69242, I69243, I69244, I69249, I69251, I69252, I69253, I69254, I69259, I69261, I69262, I69263, I69264, I69265, I69269, I69331, I69332, I69333, I69334, I69339, I69341, I69342, I69343, I69344, I69349, I69351, I69352, I69353, I69354, I69359, I69361, I69362, I69363, I69364, I69365, I69369, I69831, I69832, I69833, I69834, I69839, I69841, I69842, I69843, I69844, I69849, I69851, I69852, I69853, I69854, I69859, I69861, I69862, I69863, I69864, I69865, I69869, I69931, I69932, I69933, I69934, I69939, I69941, I69942, I69943, I69944, I69949, I69951, I69952, I69953, I69954, I69959, I69961, I69962, I69963, I69964, I69965, I69969, R532

Current Admission
G800, G801, G802, G804, G808, G809, I69031, I69032, I69033, I69034, I69039, I69041, I69042, I69043, I69044, I69049, I69051, I69052, I69053, I69054, I69059, I69061, I69062, I69063, I69064, I69065, I69069, I69131, I69132, I69133, I69134, I69139, I69141, I69142, I69143, I69144, I69149, I69151, I69152, I69153, I69154, I69159, I69161, I69162, I69163, I69164, I69165, I69169, I69231, I69232, I69233, I69234, I69239, I69241, I69242, I69243, I69244, I69249, I69251, I69252, I69253, I69254, I69259, I69261, I69262, I69263, I69264, I69265, I69269, I69331, I69332, I69333, I69334, I69339, I69341, I69342, I69343, I69344, I69349, I69351, I69352, I69353, I69354, I69359, I69361, I69362, I69363, I69364, I69365, I69369, I69831, I69832, I69833, I69834, I69839, I69841, I69842, I69843, I69844, I69849, I69851, I69852, I69853, I69854, I69859, I69861, I69862, I69863, I69864, I69865, I69869, I69931, I69932, I69933, I69934, I69939, I69941, I69942, I69943, I69944, I69949, I69951, I69952, I69953, I69954, I69959, I69961, I69962, I69963, I69964, I69965, I69969

Collagen Vascular Disease
Look-back Period or Current Admission
A1801, L900, L940, L941, L943, M0500, M05011, M05012, M05019, M05021, M05022, M05029, M05031, M05032, M05039, M05041, M05042, M05049, M05051, M05052, M05059, M05061, M05062, M05069, M05071, M05072, M05079, M0509, M0510, M05111, M05112, M05119, M05121, M05122, M05129, M05131, M05132, M05139, M05141, M05142, M05149, M05151, M05152, M05159, M05161, M05162, M05169, M05171, M05172, M05179, M0519, M0520, M05211, M05212, M05219, M05221, M05222, M05229, M05231, M05232, M05239, M05241, M05242, M05249, M05251, M05252, M05259, M05261, M05262, M05269, M05271, M05272, M05279, M0529, M0530, M05311, M05312, M05319, M05321, M05322, M05329, M05331, M05332, M05339, M05341, M05342, M05349, M05351, M05352, M05359, M05361, M05362, M05369, M05371, M05372, M05379, M0539, M0540, M05411, M05412, M05419, M05421, M05422, M05429, M05431, M05432, M05439, M05441, M05442, M05449, M05451, M05452, M05459, M05461, M05462, M05469, M05471, M05472, M05479, M0549, M0550, M05511, M05512, M05519, M05521, M05522, M05529, M05531, M05532, M05539, M05541, M05542, M05549, M05551, M05552, M05559, M05561, M05562, M05569, M05571, M05572, M05579, M0559, M0560, M05611, M05612, M05619, M05621, M05622, M05629, M05631, M05632, M05639, M05641, M05642, M05649, M05651, M05652, M05659, M05661, M05662, M05669, M05671, M05672, M05679, M0569, M0570, M05711, M05712, M05719, M05721,

M05722, M05729, M05731, M05732, M05739, M05741, M05742, M05749, M05751, M05752, M05759, M05761, M05762, M05769, M05771, M05772, M05779, M0579, M0580, M05811, M05812, M05819, M05821, M05822, M05829, M05831, M05832, M05839, M05841, M05842, M05849, M05851, M05852, M05859, M05861, M05862, M05869, M05871, M05872, M05879, M0589, M059, M0600, M06011, M06012, M06019, M06021, M06022, M06029, M06031, M06032, M06039, M06041, M06042, M06049, M06051, M06052, M06059, M06061, M06062, M06069, M06071, M06072, M06079, M0608, M0609, M061, M0620, M06211, M06212, M06219, M06221, M06222, M06229, M06231, M06232, M06239, M06241, M06242, M06249, M06251, M06252, M06259, M06261, M06262, M06269, M06271, M06272, M06279, M0628, M0629, M0630, M06311, M06312, M06319, M06321, M06322, M06329, M06331, M06332, M06339, M06341, M06342, M06349, M06351, M06352, M06359, M06361, M06362, M06369, M06371, M06372, M06379, M0638, M0639, M064, M0680, M06811, M06812, M06819, M06821, M06822, M06829, M06831, M06832, M06839, M06841, M06842, M06849, M06851, M06852, M06859, M06861, M06862, M06869, M06871, M06872, M06879, M0688, M0689, M069, M0800, M08011, M08012, M08019, M08021, M08022, M08029, M08031, M08032, M08039, M08041, M08042, M08049, M08051, M08052, M08059, M08061, M08062, M08069, M08071, M08072, M08079, M0808, M0809, M081, M0820, M08211, M08212, M08219, M08221, M08222, M08229, M08231, M08232, M08239, M08241, M08242, M08249, M08251, M08252, M08259, M08261, M08262, M08269, M08271, M08272, M08279, M0828, M0829, M083, M0840, M08411, M08412, M08419, M08421, M08422, M08429, M08431, M08432, M08439, M08441, M08442, M08449, M08451, M08452, M08459, M08461, M08462, M08469, M08471, M08472, M08479, M0848, M0880, M08811, M08812, M08819, M08821, M08822, M08829, M08831, M08832, M08839, M08841, M08842, M08849, M08851, M08852, M08859, M08861, M08862, M08869, M08871, M08872, M08879, M0888, M0889, M0890, M08911, M08912, M08919, M08921, M08922, M08929, M08931, M08932, M08939, M08941, M08942, M08949, M08951, M08952, M08959, M08961, M08962, M08969, M08971, M08972, M08979, M0898, M0899, M1200, M12011, M12012, M12019, M12021, M12022, M12029, M12031, M12032, M12039, M12041, M12042, M12049, M12051, M12052, M12059, M12061, M12062, M12069, M12071, M12072, M12079, M1208, M1209, M320, M3210, M3211, M3212, M3213, M3214, M3215, M3219, M328, M329, M3300, M3301, M3302, M3309, M3310, M3311, M3312, M3319, M3320, M3321, M3322, M3329, M3390, M3391, M3392, M3399, M340, M341, M342, M3481, M3482, M3483, M3489, M349, M3500, M3501, M3502, M3503, M3504, M3509, M351, M353, M355, M358, M359, M360, M368, M450, M451, M452, M453, M454, M455, M456, M457, M458, M459, M4600, M4601, M4602, M4603, M4604, M4605, M4606, M4607, M4608, M4609, M461, M4650, M4651, M4652, M4653, M4654, M4655, M4656, M4657, M4658, M4659, M4680, M4681, M4682, M4683, M4684, M4685, M4686, M4687, M4688, M4689, M4690, M4691, M4692, M4693, M4694, M4695, M4696, M4697, M4698, M4699, M488X1, M488X2, M488X3, M488X4, M488X5, M488X6, M488X7, M488X8, M488X9, M4980, M4981, M4982, M4983, M4984, M4985, M4986, M4987, M4988, M4989

Coagulopathy
Look-back Period or Current Admission
D690, D691, D692, D698, D699

Thrombocytopenia
Look-back Period

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

D693, D6941, D6942, D6949, D6951, D6959, D696, D7582

<u>Current Admission</u>
D693, D6941, D6942, D6949

Hemophilia/Congenital Coagulopathy
<u>Look-back Period or Current Admission</u>
D65, D66, D67, D680, D681, D682, D68311, D68312, D68318, D6832, D684, D688, D689

Smoking History
<u>Look-back Period or Current Admission</u>
Z87891

Post Inflammatory Pulmonary Fibrosis
<u>Look-back Period or Current Admission</u>
J8410, J84112, J84113, J84114, J84115, J8417, J8489

Cushing's Disease (*)
<u>Look-back Period or Current Admission</u>
E240, E242, E243, E244, E248, E249

Graves' Disease
<u>Look-back Period or Current Admission</u>
E0500, E0501

Cancer
<u>Look-back Period or Current Admission</u>
C000, C001, C002, C003, C004, C005, C006, C008, C009, C01, C020, C021, C022, C023, C024, C028, C029, C030, C031, C039, C040, C041, C048, C049, C050, C051, C052, C058, C059, C060, C061, C062, C0680, C0689, C069, C07, C080, C081, C089, C090, C091, C098, C099, C100, C101, C102, C103, C104, C108, C109, C110, C111, C112, C113, C118, C119, C12, C130, C131, C132, C138, C139, C140, C142, C148, C153, C154, C155, C158, C159, C160, C161, C162, C163, C164, C165, C166, C168, C169, C170, C171, C172, C173, C178, C179, C180, C181, C182, C183, C184, C185, C186, C187, C188, C189, C19, C20, C210, C211, C212, C218, C220, C221, C222, C223, C224, C227, C228, C229, C23, C240, C241, C248, C249, C250, C251, C252, C253, C254, C257, C258, C259, C260, C261, C269, C300, C301, C310, C311, C312, C313, C318, C319, C320, C321, C322, C323, C328, C329, C33, C3400, C3401, C3402, C3410, C3411, C3412, C342, C3430, C3431, C3432, C3480, C3481, C3482, C3490, C3491, C3492, C37, C380, C381, C382, C383, C384, C388, C390, C399, C4000, C4001, C4002, C4010, C4011, C4012, C4020, C4021, C4022, C4030, C4031, C4032, C4080, C4081, C4082, C4090, C4091, C4092, C410, C411, C412, C413, C414, C419, C430, C4310, C4311, C4312, C4320, C4321, C4322, C4330, C4331, C4339, C434, C4351, C4352, C4359, C4360, C4361, C4362, C4370, C4371, C4372, C438, C439, C4400, C4401, C4409, C44101, C44102, C44109, C44111, C44112, C44119, C44121, C44122, C44129, C44191, C44192, C44199, C44201, C44202, C44209, C44211, C44212, C44219, C44221, C44222, C44229, C44291, C44292, C44299, C44300, C44301, C44309, C44310, C44311, C44319, C44320,

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

C44321, C44329, C44390, C44391, C44399, C4440, C4441, C4442, C4449, C44500, C44501, C44509, C44510, C44511, C44519, C44520, C44521, C44529, C44590, C44591, C44599, C44601, C44602, C44609, C44611, C44612, C44619, C44621, C44622, C44629, C44691, C44692, C44699, C44701, C44702, C44709, C44711, C44712, C44719, C44721, C44722, C44729, C44791, C44792, C44799, C4480, C4481, C4482, C4489, C4490, C4491, C4492, C4499, C450, C451, C452, C457, C459, C460, C461, C462, C463, C464, C4650, C4651, C4652, C467, C469, C470, C4710, C4711, C4712, C4720, C4721, C4722, C473, C474, C475, C476, C478, C479, C480, C481, C482, C488, C490, C4910, C4911, C4912, C4920, C4921, C4922, C493, C494, C495, C496, C498, C499, C4A0, C4A10, C4A11, C4A12, C4A20, C4A21, C4A22, C4A30, C4A31, C4A39, C4A4, C4A51, C4A52, C4A59, C4A60, C4A61, C4A62, C4A70, C4A71, C4A72, C4A8, C4A9, C50011, C50012, C50019, C50021, C50022, C50029, C50111, C50112, C50119, C50121, C50122, C50129, C50211, C50212, C50219, C50221, C50222, C50229, C50311, C50312, C50319, C50321, C50322, C50329, C50411, C50412, C50419, C50421, C50422, C50429, C50511, C50512, C50519, C50521, C50522, C50529, C50611, C50612, C50619, C50621, C50622, C50629, C50811, C50812, C50819, C50821, C50822, C50829, C50911, C50912, C50919, C50921, C50922, C50929, C510, C511, C512, C518, C519, C52, C530, C531, C538, C539, C540, C541, C542, C543, C548, C549, C55, C561, C562, C569, C5700, C5701, C5702, C5710, C5711, C5712, C5720, C5721, C5722, C573, C574, C577, C578, C579, C58, C600, C601, C602, C608, C609, C61, C6200, C6201, C6202, C6210, C6211, C6212, C6290, C6291, C6292, C6300, C6301, C6302, C6310, C6311, C6312, C632, C637, C638, C639, C641, C642, C649, C651, C652, C659, C661, C662, C669, C670, C671, C672, C673, C674, C675, C676, C677, C678, C679, C680, C681, C688, C689, C6900, C6901, C6902, C6910, C6911, C6912, C6920, C6921, C6922, C6930, C6931, C6932, C6940, C6941, C6942, C6950, C6951, C6952, C6960, C6961, C6962, C6980, C6981, C6982, C6990, C6991, C6992, C700, C701, C709, C710, C711, C712, C713, C714, C715, C716, C717, C718, C719, C720, C721, C7220, C7221, C7222, C7230, C7231, C7232, C7240, C7241, C7242, C7250, C7259, C729, C73, C7400, C7401, C7402, C7410, C7411, C7412, C7490, C7491, C7492, C750, C751, C752, C753, C754, C755, C758, C759, C760, C761, C762, C763, C7640, C7641, C7642, C7650, C7651, C7652, C768, C770, C771, C772, C773, C774, C775, C778, C779, C7800, C7801, C7802, C781, C782, C7830, C7839, C784, C785, C786, C787, C7880, C7889, C7900, C7901, C7902, C7910, C7911, C7919, C792, C7931, C7932, C7940, C7949, C7951, C7952, C7960, C7961, C7962, C7970, C7971, C7972, C7981, C7982, C7989, C799, C7A00, C7A010, C7A011, C7A012, C7A019, C7A020, C7A021, C7A022, C7A023, C7A024, C7A025, C7A026, C7A029, C7A090, C7A091, C7A092, C7A093, C7A094, C7A095, C7A096, C7A098, C7A1, C7A8, C7B00, C7B01, C7B02, C7B03, C7B04, C7B09, C7B1, C7B8, C800, C801, C802, C8100, C8101, C8102, C8103, C8104, C8105, C8106, C8107, C8108, C8109, C8110, C8111, C8112, C8113, C8114, C8115, C8116, C8117, C8118, C8119, C8120, C8121, C8122, C8123, C8124, C8125, C8126, C8127, C8128, C8129, C8130, C8131, C8132, C8133, C8134, C8135, C8136, C8137, C8138, C8139, C8140, C8141, C8142, C8143, C8144, C8145, C8146, C8147, C8148, C8149, C8170, C8171, C8172, C8173, C8174, C8175, C8176, C8177, C8178, C8179, C8190, C8191, C8192, C8193, C8194, C8195, C8196, C8197, C8198, C8199, C8200, C8201, C8202, C8203, C8204, C8205, C8206, C8207, C8208, C8209, C8210, C8211, C8212, C8213, C8214, C8215, C8216, C8217, C8218, C8219, C8220, C8221, C8222, C8223, C8224, C8225, C8226, C8227, C8228, C8229, C8230, C8231, C8232, C8233, C8234, C8235, C8236, C8237, C8238, C8239, C8240, C8241, C8242, C8243, C8244, C8245, C8246, C8247, C8248, C8249, C8250, C8251, C8252, C8253, C8254, C8255, C8256, C8257, C8258, C8259, C8260, C8261,

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

C8262, C8263, C8264, C8265, C8266, C8267, C8268, C8269, C8280, C8281, C8282, C8283, C8284, C8285, C8286, C8287, C8288, C8289, C8290, C8291, C8292, C8293, C8294, C8295, C8296, C8297, C8298, C8299, C8300, C8301, C8302, C8303, C8304, C8305, C8306, C8307, C8308, C8309, C8310, C8311, C8312, C8313, C8314, C8315, C8316, C8317, C8318, C8319, C8330, C8331, C8332, C8333, C8334, C8335, C8336, C8337, C8338, C8339, C8350, C8351, C8352, C8353, C8354, C8355, C8356, C8357, C8358, C8359, C8370, C8371, C8372, C8373, C8374, C8375, C8376, C8377, C8378, C8379, C8380, C8381, C8382, C8383, C8384, C8385, C8386, C8387, C8388, C8389, C8390, C8391, C8392, C8393, C8394, C8395, C8396, C8397, C8398, C8399, C8400, C8401, C8402, C8403, C8404, C8405, C8406, C8407, C8408, C8409, C8410, C8411, C8412, C8413, C8414, C8415, C8416, C8417, C8418, C8419, C8440, C8441, C8442, C8443, C8444, C8445, C8446, C8447, C8448, C8449, C8460, C8461, C8462, C8463, C8464, C8465, C8466, C8467, C8468, C8469, C8470, C8471, C8472, C8473, C8474, C8475, C8476, C8477, C8478, C8479, C8490, C8491, C8492, C8493, C8494, C8495, C8496, C8497, C8498, C8499, C84A0, C84A1, C84A2, C84A3, C84A4, C84A5, C84A6, C84A7, C84A8, C84A9, C84Z0, C84Z1, C84Z2, C84Z3, C84Z4, C84Z5, C84Z6, C84Z7, C84Z8, C84Z9, C8510, C8511, C8512, C8513, C8514, C8515, C8516, C8517, C8518, C8519, C8520, C8521, C8522, C8523, C8524, C8525, C8526, C8527, C8528, C8529, C8580, C8581, C8582, C8583, C8584, C8585, C8586, C8587, C8588, C8589, C8590, C8591, C8592, C8593, C8594, C8595, C8596, C8597, C8598, C8599, C860, C861, C862, C863, C864, C865, C866, C880, C884, C888, C889, C9000, C9001, C9002, C9010, C9011, C9012, C9020, C9021, C9022, C9030, C9031, C9032, C9100, C9101, C9102, C9110, C9111, C9112, C9130, C9131, C9132, C9140, C9141, C9142, C9150, C9151, C9152, C9160, C9161, C9162, C9190, C9191, C9192, C91A0, C91A1, C91A2, C91Z0, C91Z1, C91Z2, C9200, C9201, C9202, C9210, C9211, C9212, C9220, C9221, C9222, C9230, C9231, C9232, C9240, C9241, C9242, C9250, C9251, C9252, C9260, C9261, C9262, C9290, C9291, C9292, C92A0, C92A1, C92A2, C92Z0, C92Z1, C92Z2, C9300, C9301, C9302, C9310, C9311, C9312, C9330, C9331, C9332, C9390, C9391, C9392, C93Z0, C93Z1, C93Z2, C9400, C9401, C9402, C9420, C9421, C9422, C9430, C9431, C9432, C9480, C9481, C9482, C9500, C9501, C9502, C9510, C9511, C9512, C9590, C9591, C9592, C960, C962, C964, C969, C96A, C96Z, D030, D0310, D0311, D0312, D0320, D0321, D0322, D0330, D0339, D034, D0351, D0352, D0359, D0360, D0361, D0362, D0370, D0371, D0372, D038, D039, D45, D47Z9, Z5111, Z5112, Z8500, Z8501, Z85020, Z85028, Z85030, Z85038, Z85040, Z85048, Z8505, Z85060, Z85068, Z8507, Z8509, Z85110, Z85118, Z8512, Z8520, Z8521, Z8522, Z85230, Z85238, Z8529, Z853, Z8540, Z8541, Z8542, Z8543, Z8544, Z8545, Z8546, Z8547, Z8548, Z8549, Z8550, Z8551, Z85520, Z85528, Z8553, Z8554, Z8559, Z856, Z8571, Z8572, Z8579, Z85810, Z85818, Z85819, Z85820, Z85821, Z85828, Z85830, Z85831, Z85840, Z85841, Z85848, Z85850, Z85858, Z8589, Z859

Specific Abdominal Cancer
Look-back Period or Current Admission
C220, C221, C222, C223, C224, C227, C228, C229, C23, C240, C241, C248, C249, C250, C251, C252, C253, C254, C257, C258, C259, C260, C261, C269, C451, C480, C481, C482, C488

Hypothyroidism
Look back period or Current Admission
E000, E001, E002, E009, E018, E02, E030, E031, E032, E033, E038, E039, E890

APPENDIX E: Definitions of comorbidities (unless otherwise specified, all ICD-10 diagnosis codes)

Chronic Peptic Ulcer Disease
Look-back Period
K254, K255, K256, K257, K259

Current Admission
K254, K255, K256, K257

HIV and AIDS (*)
Look-back Period or Current Admission
B20

Weight Loss
Look-back Period or Current Admission
E40, E41, E42, E43, E440, E441, E45, E46, E560, E561, E568, E569, E58, E59, E60, E610, E611, E612, E613, E614, E615, E616, E617, E618, E619, E630, E631, E638, E639, E640, E648, E649, R634, R636

Sickle Cell Anemia (*)
Look-back Period or Current Admission
D5700, D5701, D5702, D571, D5720, D57211, D57212, D57219, D5780, D57811, D57812, D57819

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