EMERGENCY TRIAGE, TREAT, AND TRANSPORT (ET3) MODEL

EVALUATION TECHNICAL APPENDIX

January 2025

Center for Medicare and Medicaid Innovation

TABLE OF CONTENTS

APPENDIX A. LIST OF ALL ET3 PARTICIPANTS BY ACTIVE AND NON-ACTIVE STATUS

EXHIBIT A1. LIST OF ET3 PARTICIPANTS

Participant Name	Non-Active	Active	Higher Volume
Acadian Ambulance Service of Texas, LLC		X	
Acadian Ambulance Service, Inc.	X		X
American Medical Response Ambulance Service, Inc. *	X		
American Medical Response Ambulance Service, Inc. *	X		
American Medical Response Ambulance Service, Inc. *	X		
American Medical Response Ambulance Service, Inc. *	X		
American Medical Response Ambulance Service, Inc. *		X	
American Medical Response Ambulance Service, Inc. *		X	
American Medical Response Ambulance Service, Inc. *	X		
American Medical Response Ambulance Service, Inc. *		X	
American Medical Response Northwest, Inc. *	X		
American Medical Response Northwest, Inc. *		X	
American Medical Response of Colorado, Inc. *	X		
American Medical Response of Colorado, Inc. *	X		
American Medical Response of Colorado, Inc. *	X		
American Medical Response of Colorado, Inc. *		X	
American Medical Response of Colorado, Inc. *		X	
American Medical Response of Connecticut, Inc.		X	
American Medical Response of Inland Empire		X	
American Medical Response of Maricopa. LLC	X		
American Medical Response of Massachusetts, Inc.		X	
American Medical Response of Southern California, Inc.	X		
American Medical Response of Tennessee, Inc.	X		
American Medical Response of Texas, Inc.	X		
American Medical Response West *	X		
American Medical Response West *		X	
American Medical Response West *		X	
American Medical Response West *		X	
American Medical Response West *		X	
American Medical Response West *		X	
American Medical Response West *	X		
Arlington County Fire Department	X		
Atlantic/Palm Beach Ambulance, Inc.	X		
Boston Public Health Commission	X		
Brewster Ambulance Service	X		

Participant Name	Non-Active	Active	Higher Volume
Broward Ambulance, Inc.		X	
Cape Fear Valley Mobile Integrated Health Care		X	
Carilion Clinic Patient Transportation, LLC	X		
Chesterfield County Fire and EMS		X	
Christian Hospital Northeast - Northwest	X		
Cincinnati Fire Department	X		
City and County of San Francisco	X		
City of Annapolis	X		
City of Auburn Hills		X	
City of Austin	X		
CITY OF Baltimore Mayor and City Council of Baltimore		X	
City of Baton Rouge/Parish of East Baton Rouge		X	X
City of Beverly Hills Fire Department		X	
City of Brecksville		X	
City of Brownsville		X	
City Of El Paso		X	
City of Houston	X		
City of Memphis	X		
City of Mesa		X	
City of Plano		X	
City of Rochester		X	
City of Rochester Hills	X		
City of Rockford		X	
City of Surprise		X	
City of Thornton	X		
Clayton County Board of Commissioners		X	
Clifton Park and Halfmoon Emergency Corps Inc.	X		
Community LifeTeam EMS Inc.		X	
Contra Costa County Fire Protection District		X	
Corning Ambulance Service, Inc.		X	
Crest Transportation Services Inc.		X	
Delta County Ambulance District		X	X
Desert Valley Medical Transport, Inc.	X		
Downieville Fire Protection District		X	
E.M.S. Ventures, Inc.		X	
Eagle County Health Service District		X	
Eastern Paramedics, Inc.		X	
Empress Ambulance Service, LLC.		X	
ETMC EMS	X		

Participant Name	Non-Active	Active	Higher Volume
Falck Rocky Mountain, Inc.	X		
Fisher Titus Affiliated Services		X	X
Flushing Hospital and Medical Center	X		
Forsyth County Emergency Services		X	
Gold Coast Ambulance Service	X		
Gold Cross EMS, Inc.		X	
Grayslake Fire Protection District		X	
Greater Round Lake Fire Protection District		X	
HMH Hospitals Corporation *	X		
HMH Hospitals Corporation *	X		
Hunter's Ambulance Service, Inc		X	
Huron Valley Ambulance Inc	X		
Jackson Community Ambulance Inc	X		
Kanawha County Emergency Ambulance Authority	X		
Lakeland Hospitals At Niles And St Joseph, Inc		X	
LaSalle Ambulance, Inc.	X		
Lenox Hill Hospital Ambulance		X	
Libertyville Fire Department		X	
Life Line Ambulance Service, Inc.		X	
LIFECARE AMBULANCE INC		X	
Lifefleet Southeast, Inc.		X	
Lifeguard Ambulance Service of Florida, LLC	X		
Lifeguard Ambulance Service of Texas, Inc. *	X		
Lifeguard Ambulance Service of Texas, Inc. *	X		
Lifeline Ambulance Services Inc.		X	
LifeStar Emergency Services, LLC		X	
Lonestar Ambulance 1, LLC	X		
Los Angeles Fire Department		X	
Maimonides Medical Center		X	
Mayo Clinic Ambulance		X	
Mecklenburg Emergency Medical Services Agency		X	
Med Care Emergency Medical Services Inc.		X	
Medical Center EMS,LLC		X	
Medics Ambulance Service, Inc.		X	
MedicWest Ambulance, Inc.		X	
Medina Hospital		X	
Mehlville Fire Protection District		X	
Mercy Ambulance of Evansville, Inc.		X	
Mercy, Inc.		X	

Participant Name	Non-Active	Active	Higher Volume
Metro Ambulance Services, Inc.		X	
Miami-Dade County		X	
Milton S. Hershey Medical Center		X	
Montgomery County Hospital District	X		
Montgomery County, Maryland		X	
Mount Sinai Hospital		X	
Mutual Aid Ambulance Service, Inc		X	
National Ambulance and Oxygen Service, Inc.		X	
New Britain Emergency Medical Services, Inc.		X	
New York City Health and Hospitals Corp.		X	
Norman Regional Hospital Authority		X	
North County Fire and Medical District		X	
North Shore University Hospital Ambulance		X	
Nucare Carolina Ambulance		X	
NYU Langone Hospitals		X	
Palm Beach County Fire Rescue	X		
Paramedics Logistics South Dakota, LLC		X	
Park Hospital District DBA Estes Park Health		X	
Park Slope Volunteer Ambulance Corps Inc		X	
Parkland Ambulance Service Inc.	X		
Prisma Health Upstate	X		
Randle-Eastern Ambulance Service, Inc.		X	
RBR Management, LLC		X	
Regional Emergency Medical Services Authority		X	
Regional Paramedical Services, Inc.		X	
Richmond Ambulance Authority		X	
River Medical, Inc.		X	
RM Arizona Holdings, Inc. *		X	
RM Arizona Holdings, Inc. *		X	
Roanoke County Fire & Rescue Department		X	
Roanoke Fire - EMS	X		
Rural/Metro Corporation	X		
Rural/Metro Corporation		X	
Rural/Metro of California, Inc.		X	
Rural/Metro of San Diego, Inc.	X		
Rural/Metro of Tennessee, L.P.		X	
San Antonio Fire Department		X	
Sedgwick County EMS	X		
SeniorCare Emergency Medical Services Inc.		X	

Participant Name	Non-Active	Active	Higher Volume
South County Fire and Medical District		X	
South Metro - Cunningham Fire Rescue Authority	X		
Southside Communities Fire Protection Inc.	X		
Southwest Ambulance of Casa Grande, Inc.	X		
Southwest Ambulance of Southeastern Arizona, Inc.		X	
St. Charles County Ambulance District		X	
State of Hawaii Department of Health	X		
Staten Island University Hospital Ambulance		X	
The City of Akron	X		X
The City of West Allis	X		
The Jamaica Hospital	X		
The Metropolitan Area EMS Authority		X	X
The New York and Presbyterian Hospital		X	
Thompson Valley Emergency Medical Services, Inc		X	
Town of Colonie		X	
Town of Vinalhaven		X	
Town of Wallingford		X	
Towns Ambulance Service, Inc.		X	
Tri-State Ambulance, Inc.	X		
Troup County Emergency Medical Services, Inc.	X		
Troy Ambulance Service, Inc.	X		
United Ambulance Service	X		
United Ambulance Service - Bridgton	X		
University Hospital		X	
Upper Pine River Fire Protection District	X		
Ute Pass Regional Health Service District	X		
Village of Mundelein		X	
Wake County EMS	X		X
Wauconda Fire Protection District		X	
West Metro Fire Protection District		X	X
West Shore Advanced Life Support Services, Inc.	X		
Westmed Ambulance, Inc.		X	
Willacy County EMS Inc.		X	

Notes: Each row corresponds with a separate participant. * These participants had separate subsidiary entities serving as participants under the same name.

APPENDIX B. DESCRIPTION OF DATA AND METHODS FOR ET3 EVALUATION

DATA

The analytic files for the evaluation were assembled by the ET3 Model's Implementation and Monitoring Contractor (IMC) per direction of the ET3 evaluation. Data for the ET3 evaluation come from beneficiary data and Medicare claims from the inpatient, outpatient, and carrier files in the Chronic Conditions Warehouse which contains final action Medicare claims. To ensure that Medicare claims used in the evaluation covered the full three year period of the ET3 Model, the evaluation's analytic file was updated using a claims pull 7 months after 12/31/2023. Data on Medicare claims were combined with programmatic records of participants, their service areas, and lists of participant health care partners to create the variables in the evaluation's analytic files. Descriptions of the variables included in the ET3 evaluation's analysis are provided later in this appendix. The ET3 IMC constructed the analytic files used for the ET3 evaluation in SAS.

UNIT OF ANALYSIS AND OUTCOME MEASURES

The ET3 evaluation defined an emergency medical service (EMS) episode as a care episode including claims for ambulance services and a component with health services claims from a health care provider. The evaluation an EMS episode as its unit of analysis. For treatment in place (TIP) or transport to an alternative destination (TAD) episodes, ambulance services may include ambulance transport to an alternative destination or facilitation of health service delivery for treatment in place. Health services in ET3 interventions would be delivered by Alternative Destination Providers (ADPs) for TAD, or Qualified Health Care Providers (QHCPs) for TIP. For low acuity ED episodes in the referent group, the ambulance component would include transport to a hospital ED, and the health services component would include care provided in the hospital.

Outcomes in the ET3 evaluation included Medicare parts A and B spending and three types of health outcomes following an initial index event which was either an ET3 TIP or TAD intervention; or an ambulance transport to a low acuity ED visit. The three health events are all-cause inpatient hospitalization, all-cause ED visit, and all-cause patient mortality. These outcomes were constructed for two time horizons: the "same day+1" as the index event, or the date of the index event and five days after the date of the index event per the following definitions.

- "Same-day+1" horizon: any claims or mortality occurring on the same date as the index event as well as one day after the date of the index event.
- Five-day horizon: any claims or mortality occurring on the date of the index event and five days after the date of the index event. For example, if an ET3 intervention occurred on Feb 5, 2021, the five-day horizon would include all Medicare claims incurred during days leading to and on Feb 10, 2021.

The following table lists and describes the outcome variables that were created and used in the evaluation. Separate versions of each outcome variable were created for the same-day horizon as well as the five-day horizon.

EXHIBIT B1. OUTCOME VARIABLES IN ET3 EVALUATION

Variable name	Description	Data source
All-cause hospitalization	Any inpatient hospitalization at a short-term acute care hospital or critical care hospital following the index event during the applicable time horizon.	FFS Medicare claims from the Chronic Condition Warehouse Inpatient claims file
All-cause death	Beneficiary death following the index event occurring during the applicable time horizon.	Master Beneficiary Summary File
All-cause ED Visit	Any ED visit at a short-term acute care hospital or critical care hospital following the index event during the applicable time horizon.	FFS Medicare claims from the Chronic Condition Warehouse Outpatient and Carrier Claims files
Medicare Parts A and B Spending	The sum of Medicare FFS payments across all part A and B claims incurred during the applicable time horizon.	FFS Medicare claims from the Chronic Condition Warehouse from the inpatient, outpatient, SNF, HHA, durable medical equipment, and carrier files.

REMOVAL OF DUPLICATE ED VISIT CLAIMS IN MEASURING ED VISITS

ED visits were a key variable in the ET3 evaluation's analyses. A single ED visit by a Medicare beneficiary may result in the generation of multiple Medicare claims in the inpatient, outpatient and Carrier files (Venkatesh et al., 2016). To limit overcounting of ED visits, steps were taken to prevent tallying different Medicare claims pointing to the same ED visit as separate ED visits in the construction of the evaluation's ED visit outcome. Initial descriptive examination of the ED visit outcome in the ET3 evaluation showed that claims between the carrier and outpatient files likely associated with the same ED visit contributed inaccurate and higher numbers of ED visits. After applying exclusions removing multiple claims associated with the same ED visit, average ED visit rates fell. The following steps generally follow Venkatesh et al., (2016), who also served as the quality measure contractor for the ET3 Model and were used to more accurately tally counts of hospital ED visits for the ET3 evaluation.

1. **Identify initial pool of ED visit claims.** All ED visit claims occurring during the period Jan 1 2021 to Dec 31 2023 were identified from carrier claims using HCPCS 99281, 99282, 99283, 99284, 99285, 99291 with place of service for ED setting and from hospital outpatient and inpatient claims indicating use of ED services based on revenue center codes 0450-0459, 0981.
2. **Remove claims within outpatient/inpatient claims or carrier claims likely due to billing errors.** Outpatient or Inpatient facility claims were considered duplicate if two or more

claims had the same hospital (CCN), the same revenue center (REV_CNTR), the same patient (BENE_ID) on the same date without the presence of coding modifiers 25 or 27. Duplicate provider claims in the carrier file were identified as those with identical taxpayer identification number (TIN), identical ED clinician (NPI), identical patient (BENE_ID), and date of service based on LINE_1ST_EXPNS_DT.

3. **Remove claims between outpatient/inpatient claims and carrier claims that reflect the same ED visit**. Following Venkatesh et al., (2016) we assumed each provider claim reflected a unique ED visit. Where a hospital outpatient or inpatient claim occurred on the same day, prior day, or following calendar day for the same beneficiary it was assumed to be duplicative.
4. **Additional Exclusions and Steps to identify ED visits**.
    a. **Exclude critical care services delivered in non hospital ED settings**. Excluded all carrier claims with HCPCS 99291 not occurring in the ED setting.
    b. **Exclude claims with non ED settings**. Any provider claim with place of service code for a non ED setting was excluded.
    c. Identifying ED visits followed by hospital observation admissions. Outpatient claims indicating hospital observation (outpatient revenue center 0762 or 0760 with HCPCS G0378) with hospital revenue center codes for ED services present were included as ED visits.

IDENTIFICATION OF LOW ACUITY ED EPISODES AND CREATION OF THE ET3 REFERENT GROUP

The ET3 evaluation used low acuity ED episodes to approximate outcomes that would have occurred in the absence of the ET3 Model. While the initial intent was to create a viable counterfactual for ET3 interventions, descriptive comparisons between recipients of ET3 interventions and persons that received low acuity ED episodes suggested important differences may remain even after matching on beneficiary characteristics and using entropy weights to balance differences in the clinical characteristics of ET3 and referent EMS episodes. This section of the appendix describes rationale for using the ET3 referent group, the steps taken to identify low acuity ED visits, and subsequent steps that were used to enhance the comparability of the referent group in the ET3 evaluation.

Low acuity ED episodes are defined as ambulance and hospital ED services provided to a FFS Medicare beneficiary where the hospital ED visit is classified as a low acuity ED visit according to the definition used by Jeffrey et al., (2016). Identification of low acuity ED episodes from Medicare claims followed the definition and approach delineated by Jeffrey et al., (2016) which was developed with the intent of identifying primary care treatable ED visits from administrative data. Specifically, a low acuity ED visit is an ED visit that did not result in an inpatient hospital admission and

- whose most severe HCPCS/CPT Evaluation and Management (E&M) code is 99281 (see table 1 below); or

- whose most severe HCPCS/CPT E&M code is either 99282 or 99283 and no HCPCS code ED indicator was present on the claim (see appendix table B2 for a full list of the HCPCS code ED indicator codes).

Where CPT codes 99282 or 99283 were present, all procedures that occurred on the same day as the ED visit were reviewed for procedures indicating necessity of ED visit not just procedures on claims with a place of service code for the ED. The low acuity ED visit definition used may be described as ED visits that could have been treated in a primary care setting instead of a hospital ED. Identifying low acuity ED visit episodes in this way is straightforward, and this approach primarily appears to capture low acuity episodes of care delivered in a hospital ED. Identification of low acuity ED episodes were restricted to those pickup ZIP codes within the service areas of active ET3 participants. Low acuity ED episodes where an active ET3 participant provided ambulance transportation were identified through the following three step procedure.

1. Define active ET3 participant service areas as pooled list of ZIP codes across primary and secondary service areas.
2. Identify all low acuity ED visits with an ambulance pickup within a ZIP code identified in step 1.
3. Remove all beneficiaries from the low acuity ED episode pool that received any ET3 interventions during the model's three-year performance period.

EXHIBIT B2. EMERGENCY DEPARTMENT HCPCS CODES INDICATING NECESSITY OF ED VISIT WHEN PRESENT WITH CPT 99282 OR 99283

HCPCS Code	Category	Short Description
J0150	Drugs administered: antiarrhytmics	Injection, Adenosine For Therapeutic Use, 6 Mg
J0282	Drugs administered: antiarrhytmics	Injection, Amiodarone Hydrochloride, 30 Mg
J0295	Drugs administered: antibiotics	Injection, Ampicillin Sodium/Sulbactam Sodium, Per 1.5 Gm
J0456	Drugs administered: antibiotics	Injection, Azithromycin, 500 Mg
J0744	Drugs administered: antibiotics	Injection, Ciprofloxacin For Intravenous Infusion, 200 Mg
J2280	Drugs administered: antibiotics	Injection, Moxifloxacin, 100 Mg
J2543	Drugs administered: antibiotics	Injection, Piperacillin Sodium/Tazobactam Sodium, 1 Gram/0.125 Grams (1.125
J1645	Drugs administered: anticoagulants	Injection, Dalteparin Sodium, Per 2500 Iu
J1650	Drugs administered: anticoagulants	Injection, Enoxaparin Sodium, 10 Mg
J0780	Drugs administered: antiemetics	Injection, Prochlorperazine, Up To 10 Mg
J1790	Drugs administered: antiemetics	Injection, Droperidol, Up To 5 Mg
J1170	Drugs administered: opioid analgesics	Injection, Hydromorphone, Up To 4 Mg
J2270	Drugs administered: opioid analgesics	Injection, Morphine Sulfate, Up To 10 Mg
J2275	Drugs administered: opioid analgesics	Injection, Morphine Sulfate (Preservative---Free Sterile Solution),
J3010	Drugs administered: opioid analgesics	Per 10 Mg Injection, Fentanyl Citrate, 0.1 Mg
J0171	Drugs administered: other drug types	Injection, Adrenalin, Epinephrine, 0.1 Mg
J0330	Drugs administered: other drug types	Injection, Succinylcholine Chloride, Up To 20 Mg
J0360	Drugs administered: other drug types	Injection, Hydralazine Hcl, Up To 20 Mg
J1265	Drugs administered: other drug types	Injection, Dopamine Hcl, 40 Mg
J1610	Drugs administered: other drug types	Injection, Glucagon Hydrochloride, Per 1 Mg

HCPCS Code	Category	Short Description
J1630	Drugs administered: other drug types	Injection, Haloperidol, Up To 5 Mg
J2310	Drugs administered: other drug types	Injection, Naloxone Hydrochloride, Per 1 Mg
J2370	Drugs administered: other drug types	Injection, Phenylephrine Hcl, Up To 1 Ml Injection,
J2710	Drugs administered: other drug types	Neostigmine Methylsulfate, Up To 0.5 Mg
J2765	Drugs administered: other drug types	Injection, Metoclopramide Hcl, Up To 10 Mg
J3430	Drugs administered: other drug types	Injection, Phytonadione (Vitamin K), Per 1 Mg
80100	Laboratory tests	Drug Scr Qual Mlt Drug Classes Chrom Ea Px
80196	Laboratory tests	Salicylate
82003	Laboratory tests	Acetaminophen
82009	Laboratory tests	Acetone/Oth Ketone Bodies Serum Qual
82010	Laboratory tests	Acetone/Oth Ketone Bodies Serum Quan
82140	Laboratory tests	Ammonia
82553	Laboratory tests	Creatine Kinase Mb Fxj Only
82803	Laboratory tests	Gases Bld Ph Calculated O2 Saturation
82805	Laboratory tests	Gases Bld Ph Dir Meas Xcpt Pls Oximtry
83605	Laboratory tests	Lactate
83874	Laboratory tests	Myoglobin
84145	Laboratory tests	Assay Of Procalcitonin
84484	Laboratory tests	Troponin Quan
84512	Laboratory tests	Troponin Qual
85378	Laboratory tests	Fibrin Dgradj Produxs D---Dimer Qual/Semiquan
85379	Laboratory tests	Fibrin Dgradj Produxs D---Dimer Quan
85380	Laboratory tests	Fibrin Dgradj Produxs D---Dimer Ultrsens
90945	Other diagnostic and therapeutic procedures	Dial Oth/Thn Hemo 1 Phys Eval
L1830	Other diagnostic and therapeutic procedures	Knee Orthosis, Immobilizer, Canvas Longitudinal, Prefabricated, Includes Fitting and Adjustment
92950	Other diagnostic and therapeutic procedures	Cardiopulm Resuscitation
31500	Other diagnostic and therapeutic procedures	Intubation Endotracheal Emergency Procedure
36430	Other diagnostic and therapeutic procedures	Transfusion Bld/Bld Components
36556	Other diagnostic and therapeutic procedures	Insj Non---Tun Ctr Cvc Age 5 Yr/>
36569	Other diagnostic and therapeutic procedures	Insj Prph Cvc W/O Subq Port/Pmp Age 5 Yr/>
43247	Other diagnostic and therapeutic procedures	Stomach---Intestine Scope For Foreign Body Removal
49465	Other diagnostic and therapeutic procedures	Contrast Injection Perq Radiologic Eval Gi Tube
62270	Other diagnostic and therapeutic procedures	Spi Pnxr Lmbr Dx
G0257	Other diagnostic and therapeutic procedures	Unscheduled Or Emergency Dialysis Treatment For An Esrd Patient In A Hospital
A9540	Radiology and related	Technetium Tc---99M Macroaggregated Albumin, Diagnostic, Per Study Dose, Up To 10
A9558	Radiology and related	Xenon Xe---133 Gas, Diagnostic, Per 10 Millicuries
70160	Radiology and related	Radex Nsl B1S Compl Minimum 3 Views
70450	Radiology and related	Ct Head/Brn C---Matrl

HCPCS Code	Category	Short Description
70487	Radiology and related	Ct Maxlfcl Area C+ Matrl
70496	Radiology and related	Ct Angiography Head W/Contrast/Noncontrast
70498	Radiology and related	Ct Angiography Neck W/Contrast/Noncontrast
70549	Radiology and related	Mra Nck C---/C+
71010	Radiology and related	Radex Ch 1 View Frnt
71275	Radiology and related	Ct Angiography Chest W/Contrast/Noncontrast
72125	Radiology and related	Ct Crv Spi C---Matrl
74010	Radiology and related	Radex Abd Anteropost&Addl Oblq&Cone Views
74022	Radiology and related	Radex Abd Compl Aqt Abd W/S/E/D Views 1 View Ch
78582	Radiology and related	Pulmonary Ventilation (Eg, Aerosol Or Gas) And Perfusion Imaging
78585	Radiology and related	Pulm Pi Part Vntj Rbrthing&Wshot +---1 Brth
78588	Radiology and related	Pulm Pi Part Vntj Img Aersl 1/Mlt Prjcj
Q9963	Radiology and related	High Osmolar Contrast Material, 350---399 Mg/Ml Iodine Concentration, Per Ml
Q9965	Radiology and related	Low Osmolar Contrast Material, 100---199 Mg/Ml Iodine Concentration, Per Ml

Source: Jeffreys et al., (2016).

Once episodes and beneficiaries with low acuity ED visits in the service areas of active ET3 participants were identified, additional steps were taken to refine the comparability of persons in the referent group relative to recipients of ET3 interventions. First, the initial set of beneficiaries with low acuity ED visits included some where significant expenditures were incurred during the time horizons examined. Because care episodes for these beneficiaries (or care delivered after the index event) likely reflect care that was needed, we took steps to exclude these persons from the referent group. Medicare Parts A and B spending across all beneficiaries with low acuity ED episodes on the same day+1 and 5-day horizon were calculated. The top 5% of beneficiaries for same day+1 spending and 5-day spending were excluded.

Second, the initial set of low acuity ED beneficiaries identified were matched on beneficiary level sociodemographic and Medicare coverage characteristics to persons with TIP interventions and separately to persons with TAD interventions. Sociodemographic variables used were gender (male/female); age group (<65, 65 to <70, 70 to <85, 85+); and race/ethnicity group (white, black, other). Coverage variables were disability & end stage renal disease (ESRD) status (disabled without ESRD, ESRD & not disabled, ESRD & disabled, neither); and dual eligibility, Medicare Part D Low Income Subsidy (LIS) status, and full Medicare supplemental coverage.

Third, entropy balancing weights were created for low acuity ED episodes retained from the preceding step. Entropy balancing weights were created using chronic condition warehouse indicator variables, AHRQ clinical classifications software refined (CCSR) categories reflecting the presence of a diagnostic condition at the time of the index event, and AHRQ CCSR categories reflecting a new condition relative to one year prior to the index event. Entropy balancing weights were applied in regression models in the evaluation's analysis.

IDENTIFY DIAGNOSTIC CLINICAL CATEGORIES ASSOCIATED WITH TIP, TAD, AND LOW ACUITY ED EPISODES IN THE REFERENT GROUP

The ET3 evaluation used the Agency for Healthcare Research and Quality's (AHRQ) Clinical Classifications Software Refined (CCSR) Tenth revision to identify categories of clinical conditions or diseases in EMS episodes. The CCSR creates more easily interpretable and intuitive clinical categories from diagnostic information in administrative data and was used to describe diagnostic clinical information about ET3 and low acuity ED episodes as well as statistically adjust for clinical conditions in the evaluation's analytic models. The CCSR provides a method for categorizing the over 70,000 International Classification of Disease, Tenth Revision (ICD10) diagnosis codes into over 530 clinical categories across 22 body systems (see Exhibit B3 below).

EXHIBIT B3. DESCRIPTION OF CLINICAL CLASSIFICATIONS SOFTWARE REFINED (CCSR) CATEGORIES

ICD-10-CM Body System	Three Character Abbreviation	Brief Description
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	BLD	BLD contains 10 categories that include diseases related to the blood, diseases of blood-forming organs, and certain disorders involving the immune mechanism such as nutritional anemia, sickle cell/trait anemia, and immunity disorders.
Diseases of the circulatory system	CIR	CIR contains 39 categories that include diseases of the circulatory system such as essential hypertension, acute myocardial infarction, heart failure, and cerebral infarction.
Dental diseases	DEN	DEN contains 3 categories that distinguish any dental condition (including traumatic injury), nontraumatic dental conditions (a subset of any dental condition), and caries, periodontitis, and other preventable dental conditions (a subset of nontraumatic dental conditions that are often treated in a dentist's office).
Diseases of the digestive system	DIG	DIG contains 25 categories that include diseases of the digestive system such as appendicitis and other appendiceal conditions, hepatic failure, diverticulosis and diverticulitis, and intestinal infection.
Diseases of the ear and mastoid process	EAR	EAR contains 6 categories that include diseases of the ear and mastoid process such as otitis media, diseases of the inner ear, and hearing loss.
Endocrine, nutritional and metabolic diseases	END	END contains 17 categories that include endocrine, nutritional, and metabolic diseases such as thyroid

ICD-10-CM Body System	Three Character Abbreviation	Brief Description
		disorders, diabetes mellitus, obesity, and cystic fibrosis.
External causes of morbidity	EXT	EXT contains 30 categories related to external causes of morbidity that specific the mechanism of the injury such as fall or cut/pierce and the intent of the injury such as accidental/unintentional or self-harm.
Diseases of the eye and adnexa	EYE	EYE contains 12 categories that include diseases of the eye and adnexa such as glaucoma, cataract and other lens disorders, and blindness and vision effects.
Factors influencing health status and contact with health services	FAC	FAC contains 25 categories related to factors influencing health status and contact with health services such as aftercare, organ transplant status, or exposure, encounters, screening or contact with infectious disease.
Diseases of the genitourinary system	GEN	GEN contains 26 categories that include diseases of the genitourinary system such as chronic kidney disease, urinary tract infections, and acute and unspecified renal failure.
Certain infectious and parasitic diseases	INF	INF contains 12 categories that include infections and parasitic diseases such as tuberculosis, septicemia, hepatitis, and the coronavirus disease – 2019 (COVID-19).
Injury, poisoning and certain other consequences of external causes	INJ	INJ contains 76 categories related to injuries, poisoning, and certain other consequences of external causes such as traumatic brain injury (TBI), allergic reactions, maltreatment/abuse, and poisoning by drugs.
Congenital malformations, deformations and chromosomal abnormalities	MAL	MAL contains 10 categories that include congenital malformations, deformations, and chromosomal abnormalities such as cleft lip or palate and cardiac and circulatory congenital anomalies.
Mental, behavioral and neurodevelopmental disorders	MBD	MBD contains 32 categories that include mental, behavioral, and neurodevelopmental disorders such as depressive disorders, alcohol-related disorders, and suicide ideation/attempt/intentional self-harm.
Diseases of the musculoskeletal system and connective tissue	MUS	MUS contains 38 categories that include diseases of the musculoskeletal system and connective tissue such as osteoarthritis, gout, low back pain, and spondylopathies/spondyloarthropathy (including infective).

ICD-10-CM Body System	Three Character Abbreviation	Brief Description
Neoplasms	NEO	NEO contains 74 categories specific to neoplasms, which include malignant neoplasms such as gastrointestinal cancers, skin cancers, and breast cancer, as well as most benign neoplasms.
Diseases of the nervous system	NVS	NVS contains 22 categories that include diseases of the nervous system such as Parkinson's disease, cerebral palsy, neurocognitive disorders, and headache (including migraine).
Certain conditions originating in the perinatal period	PNL *	PNL contains 15 categories that include certain conditions originating in the perinatal period such as liveborn, respiratory distress syndrome, and fetal alcohol syndrome.
Pregnancy, childbirth and the puerperium	PRG *	PRG contains 30 categories related to pregnancy, childbirth, and the puerperium such as ectopic pregnancy and complications, early or threatened labor, and diabetes or abnormal glucose tolerance complicating pregnancy, childbirth or the puerperium.
Diseases of the respiratory system	RSP	RSP contains 17 categories that include diseases of the respiratory system such a as influenza, asthma, acute bronchitis, and pneumothorax.
Diseases of the skin and subcutaneous tissue	SKN	SKN contains 7 categories that include diseases of the skin and subcutaneous tissue such as pressure ulcers and contact dermatitis.
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	SYM	SYM contains 17 categories related to symptoms, signs, and abnormal clinical or laboratory findings, not elsewhere classified such as fever, nausea and vomiting, and malaise and fatigue.

Notes: This table was taken from the DXCCSR user guide available from AHRQ at https://hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp#overdiagnoses.

* These CCSR categories were excluded from the analysis because they were nearly unpopulated.

The ET3 evaluation excluded two clinical condition categories because they were non-existent or had nearly no occurrence in the data. These categories are pregnancy, childbirth and puerperium (PRG) and conditions originating in the perinatal period (PNL). A third category, SYM, occurred with high frequency but was not used in reporting because per the CCSR user guide, the category does not reflect a clear diagnosis.

The CCSR was applied to Medicare claims for the ET3 evaluation and used to create approximately 530 clinical category variables for patient conditions present in an EMS episode at the time of the index event. The CCSR was also used to create clinical category variables indicating whether a

condition was newly present relative to 1 year prior to an episode's index event to account for changes in a patient's status over time.

The CCSR software uses claims-based diagnoses to rank a claim into one of four categories. But since the unit of analysis for the ET3 evaluation was an EMS episode which includes multiple claims, the CCSR's algorithm was adapted to assign CCSR clinical condition categories to an episode using all claims incurred from the date of the index event to five days after the date of the index event (see Exhibit B4). The following table describes the hierarchy that was used in assigning CCSR clinical condition categories to EMS episodes in the ET3 evaluation.

EXHIBIT B4. RULES FOR ASSIGNING A GIVEN CCSR CONDITION CATEGORY TO AN EMS EPISODE

CCSR Category Reported	Hierarchical Rules for Claim Diagnoses Found in the 5-day Window
0	No claim within an episode's 5-day window contained an ICD10 code applicable for the given CCSR clinical condition category.
1	One or more claims within an episode's 5-day window included a principal diagnosis code (e.g., first listed ICD10 code) *or* secondary diagnosis code (e.g., any other field) applicable for assigning the given clinical condition category to the episode.
2	One or more claims within an episode's 5-day window contained a principal diagnosis code *and* a secondary diagnosis code applicable for assigning the given clinical condition category to the episode where both the principal and secondary diagnosis codes were present on the same claim.
3	One or more claims within an episode's 5-day window contained a secondary diagnosis applicable for assigning the given clinical condition category to the episode and no claim contained a principal diagnosis for the clinical condition category.

EXPLANATORY VARIABLES

Covariates used in descriptive analyses of TIP and TAD interventions included the following:

- Patient Characteristics: gender; age; race; disability status; end-stage-renal-disease (ESRD) status; dual eligibility status (full or partial); Full Medicare Part D coverage during 2021-2023); Low Income Subside (LIS) status; Full Medicare supplemental coverage during 2021-2023; Rural Residence; Charlson Comorbidity Index; Claims-Based Frailty Index; Chronic Condition Indicators; AHRQ CCSR Indicators for Condition Present at Index Event; AHRQ CCSR Indicators for Condition Present 1 Year Prior to Index Event.
- ET3 Participant Characteristics: EMS organization type (fire dept, hospital based, private agency, third service public safety organization); annual number of Medicare FFS ambulance transports during 2021-2023: <4000, 4000-10,000, >10,000; service type (urban, rural, or dual).

Statistical models of outcomes for TIP interventions adjusted for clinical differences between patients and EMS episodes using the Charlson comorbidity index, claims based frailty index, and

AHRQ CCSR condition indicators reflecting new conditions relative to 1 year prior to the index event. Sensitivity analyses using chronic condition indicators showed no material difference compared to the above specification.

Chapter 2 of the main report describing organization characteristics of ET3 participants provides descriptive data on the aforementioned organizational variables used in this evaluation. The annual number of Medicare FFS ambulance transports were used to reflect differences in participant organization size. A participant organization's service type reflects the type of area (rural or urban) predominantly serviced by the participant ambulance supplier/provider during the three year period of the model using the ZIP code where an ambulance crew made contact with the patient. Categorization of rurality was determined using Rural-Urban Commuting Area (RUCA) codes. For statistical analyses the categorization presented in the report's descriptive analysis in Chapter 2 was simplified with participant service types collapsed into three categories: urban (from urban and urban-focused), rural (from rural and rural-focused), and dual. A claims based frailty index and the Charlson comorbidity index reflecting a patient's status at the time of the index event were also used to account for differences between ET3 and referent group patients.

Claims-Based Frailty Index

A claims based frailty index (FI) was created to distinguish (and adjust for) frailty differences between patients in the ET3 and referent group (Kim et al., 2018). The FI has been validated against the Health and Retirement Survey and is created by collecting all diagnosis and procedure codes present within a patient's Medicare claims over the 12 months preceding a given index event (either ET3 intervention or low acuity ED episode). A patient's diagnosis and procedure codes across the 12 months are used in a regression based algorithm to calculate the FI. Kim et al., (2019) have made the algorithm in SAS publicly available for researchers. Values for the FI vary from 0 to 1 and have been grouped into the following ranges reflecting patient frailty status, robust: <0.15, prefrail: 0.15–0.24, mildly frail: 0.25–0.34, moderate-to-severely frail: ≥0.35 (Kim et al., 2019). The FI was calculated for all ET3 interventions and low acuity ED episodes across the ET3 Model's three year performance period.

Charlson Comorbidity Index

The Charlson Comorbidity Index (CCI) uses diagnosis codes incurred over the 12 months preceding an index event to measure mortality risk in patients using 19 different clinical categories. To create the CCI, the ET3 evaluation applied the approach described by Glasheen et al., (2019), who updated the algorithm for calculating the CCI for administrative data with ICD10 codes.

ANALYTIC APPROACH USED TO ANALYZE TIP INTERVENTIONS

Beneficiary Level Exact Matching

The evaluation identified separate subsets of low acuity ED encounters (e.g., the referent group) provided to beneficiaries that were observably similar to TIP recipients or TAD recipients. Beneficiaries with low acuity ED encounters having Medicare Parts A and B spending in the top 5th percentile or higher on either a same-day+1 or 5-day basis were first excluded from the referent

group. Subsets of beneficiaries in the referent group matching exactly to TIP or TAD beneficiaries on gender (male, female); age group (0-64, 65-84, 85+); race group (white, black, other), disability/end stage renal disease (ESRD) status (ESRD, disabled, ESRD & disabled, none); and coverage status (full dual, partial dual, full Medicare supplemental coverage, low income subsidy (LIS), none) were then identified.[1] TIP-matched low acuity ED encounters were then identified by retaining all low acuity ED encounters provided to referent group beneficiaries matched to TIP recipients on the aforementioned characteristics. TAD-matched low acuity ED encounters were similarly identified by retaining all low acuity ED encounters provided to referent group beneficiaries matching TAD recipients on the aforementioned characteristics.

Entropy Balancing Weights

Entropy balancing weights were calculated for TIP-matched low acuity ED encounters using binary variables for: chronic condition flags; CCSR condition categories present at the index event; CCSR condition categories present at index but not present 12 months prior; CCI categories (0-4, 5-9, 10-17, 18+); frailty index categories (robust, prefrail, mildly frail, moderate to severely frail); participant organization type(fire dept, private agency, hospital based, third service public safety); participant areas serviced (urban, rural, dual); and participant size (0-4,000, 4,000-10,000, >10,000).

Regression Specification Used to Calculate Differences in Outcomes Associated with TIP Encounters

Medicare Parts A and B spending was modeled using a generalized linear model with poisson family and log link function. Separate regression models for Medicare spending were estimated for same-day+1 and 5-day. The specification used for Medicare Parts A and B spending is presented in equation (1). Outcomes for all-cause hospitalization, all-cause patient mortality, and all-cause ED visits following the index event were modeled using logit regression models with clustering by ET3 participant with robust standard errors. Equation (2) presents the specification used for these models. Separate regression models for risk of hospitalization, patient mortality, and ED visit following the index event were estimated for same-day+1 and 5-day. Regression models to analyze outcomes following TIP included all TIP intervention episodes (N=3,161), TIP matched low acuity ED episodes (N=32,408) and entropy balancing weights.

$$(1) \qquad E(Y_{it}) = \alpha_0 + \beta_4(tip_{it} * hvol_{it}) + \beta_3 tip_{it} + \beta_2 hvol_{it} + \beta_1 X_{it} + \beta_0 ORG_{it} + \gamma_2(hvol_{it} * time_t) + \gamma_1 time_t + \epsilon_{it}$$

$$(2) \qquad \ln\left(\frac{P}{1-P}\right) = \alpha_0 + \beta_4(tip_{it} * hvol_{it}) + \beta_3 tip_{it} + \beta_2 hvol_{it} + \beta_1 X_{it} + \beta_0 ORG_{it} + \gamma_2(hvol_{it} * time_t) + \gamma_1 time_t + \epsilon_{it}$$

In equations (1) and (2), *i* indexes an EMS episode and *t* indexes the year when the episode occurred. The outcome *Y* refers to Medicare Parts A and B spending. *P* denotes the probability that hospitalization, patient mortality, or ED visit occurred (either for same-day+1 or 5-day). *tip* is a

[1] Full dually eligible beneficiaries are those that were dually eligible for 12 months in a given performance year. Partial dually eligible beneficiaries are those with fewer than 12 months of dual eligibility in a given performance year. Full Medicare supplemental coverage denotes beneficiaries that had Medicare supplemental coverage for 36 months during the model's three year performance period.

binary variable =1 if a TIP intervention occurred and 0 otherwise. *hvol* is a binary variable =1 if the ambulance supplier/provider was a higher volume ET3 participant. *X* denotes a vector of beneficiary characteristics (age, gender, race, disability, end-stage-renal-disease (ESRD) status, full dual eligibility status; full Medicare Part D coverage across 2021-2023), LIS status; full Medicare supplemental coverage during 2021-2023; rural residence) and episode characteristics (Charlson comorbidity index, claims based frailty index; CCSR condition category) variables. *ORG is a vector of organization characteristics including EMS organization type (fire dept, hospital-based, private agency, third service public safety), type of area serviced (urban, rural, dual), and annual volume of Medicare FFS ambulance transports (0-4000, 4000-10000, 10000+). time* is a variable = 0 for episodes provided in 2021, =1 for episodes provided in 2022, and =2 for episodes provided in 2023.

Calculation of Differences In Outcomes Associated With TIP Using TIP-Matched Low Acuity ED Episodes As the Referent Group

Chapter 5 of the ET3 evaluation report reports differences in all-cause hospitalization, all-cause patient mortality, all-cause ED visits, and Medicare Parts A and B spending between TIP and TIP-matched low acuity ED episodes. Differences were categorized into labels to facilitate interpretation. "Adjusted differences" for TIP presented in Chapter 5 of the report are marginal effects for TIP for each outcome using the regression specifications in equations (1) and (2). Marginal effects estimates for TIP are the average of the difference of regression fitted values of an outcome with TIP = 1 minus regression fitted values of the outcome with TIP = 0. The sign of marginal effects estimates was used to categorize an estimate for an outcome as either "higher" or "lower", with higher denoting outcomes where the average or rate following TIP delivery is higher than the outcome after a TIP-matched low acuity ED visit. Assignment of labels reflecting magnitude (modest, moderate, large) for an estimate was done using percent adjusted difference for each adjusted difference and outcome.

The percent adjusted difference is percentage calculated as the marginal effect for an outcome divided by the conditional mean for low acuity ED episodes for the outcome. Intuitively, the percent adjusted difference may be interpreted as the marginal effect for an outcome relative to the average value of the outcome in the referent group. Estimates where the percent adjusted difference ranged from 0%-15% were assigned the label "modest", estimates with percent adjusted difference ranging from 15%-50% were denoted as "moderate", and estimates >50% were denoted as "large".

Sensitivity Analyses For Regression Results for Higher Volume and Other Active Participants

Sensitivity analyses for higher volume and other active participants were conducted to examine whether the report's main regression results were sensitive to alternate statistical specifications. Higher volume participants were those that delivered at least 100 paid ET3 interventions during the model's performance period and other active participants are those that delivered fewer than 100 paid ET3 interventions. Subgroup analyses for higher volume participants only included referent group episodes that are from pickup ZIP codes in higher volume service areas. Similarly, analyses for other active participants only included referent group episodes from pickup ZIP codes of other active participant service areas. The following equations were used to estimate effects for these subgroups.

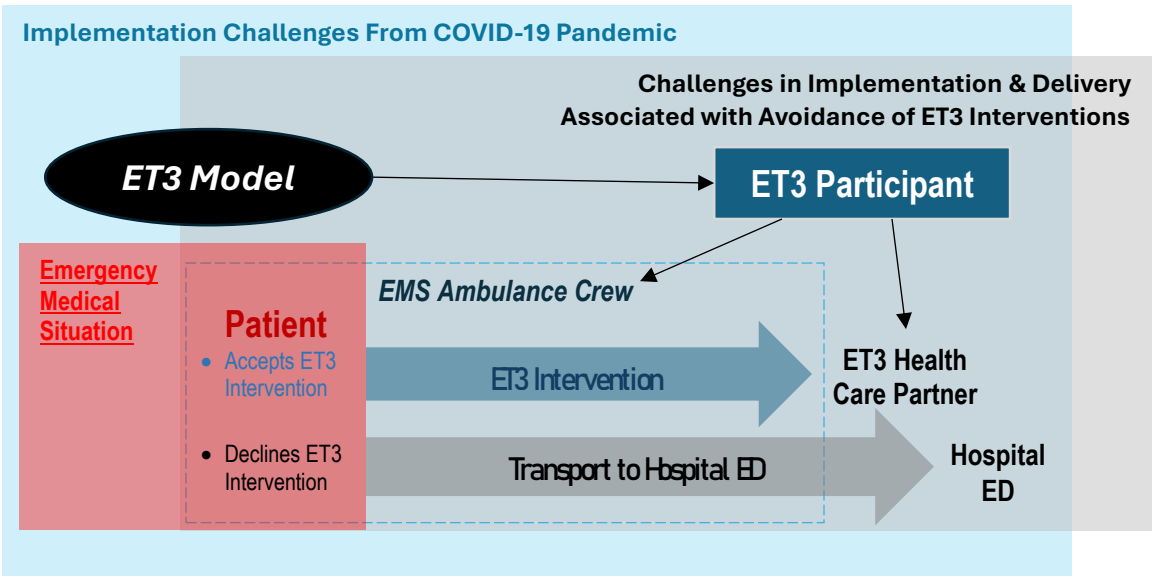
(3) $E(Y_{it}) = \alpha_0 + \beta_2 tip_{it} + \beta_1 X_{it} + \beta_0 ORG_{it} + \gamma_1 time_t + \epsilon_{it}$

(4) $\ln\left(\frac{P}{1-P}\right) = \alpha_0 + \beta_2 tip_{it} + \beta_1 X_{it} + \beta_0 ORG_{it} + \gamma_1 time_t + \epsilon_{it}$

Marginal effects in subgroup analyses were calculated using the *tip* variable. STATA version 16 was used to analyze the analytic files created by the ET3 IMC and create the report's descriptive and statistical results.

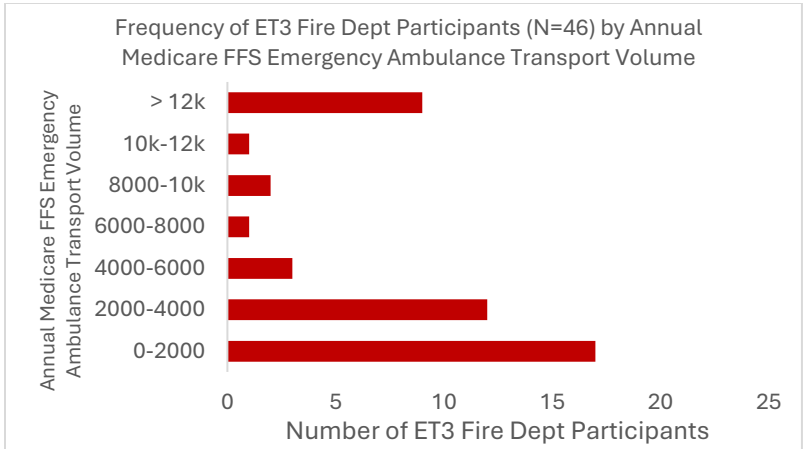
APPENDIX C. SUPPLEMENTARY CONTENT FOR INTRODUCTORY CHAPTER

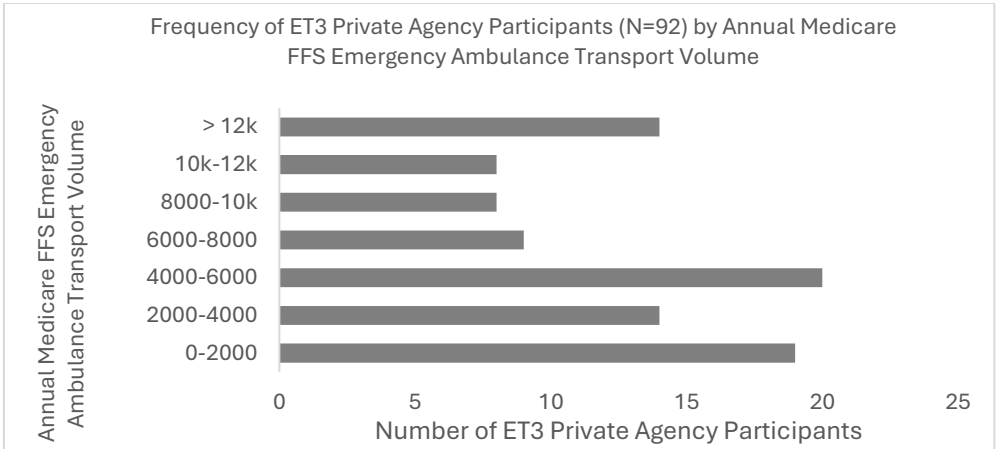
EXHIBIT C1. CONCEPTUAL FRAMEWORK FOR STUDYING EFFECTS OF THE ET3 MODEL ON MEDICARE SPENDING AND ADVERSE EVENTS

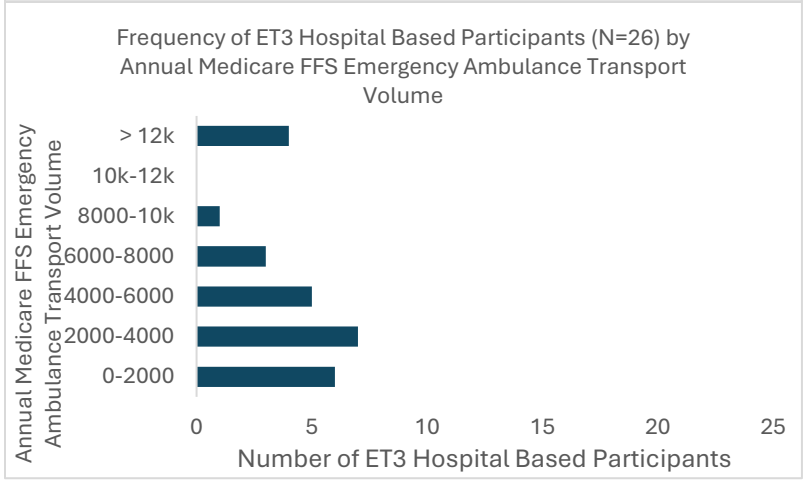


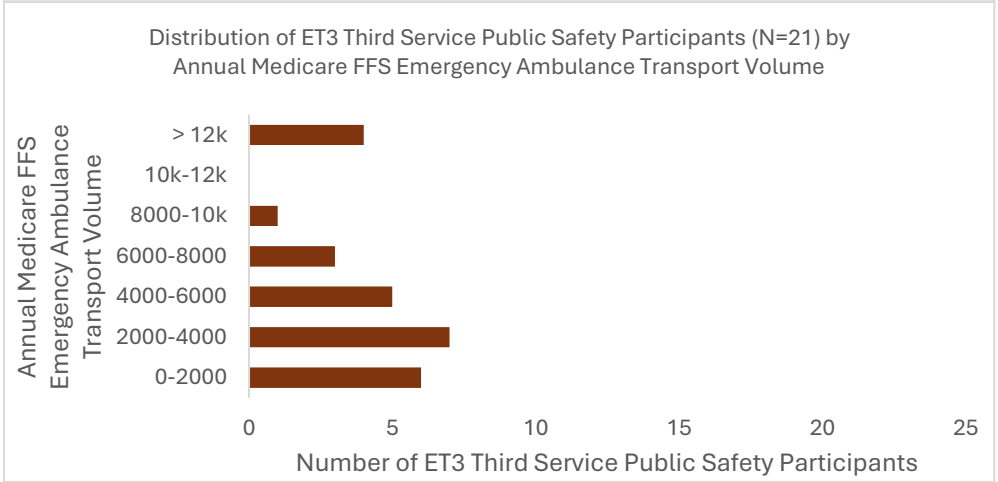
APPENDIX D. SUPPLEMENTARY CONTENT FOR CHAPTER ON CHARACTERISTICS OF ET3 PARTICIPANTS

EXHIBIT D1. FREQUENCY OF ET3 PARTICIPANTS (N=185) BY ANNUAL VOLUME OF MEDICARE FFS EMERGENCY AMBULANCE EPISODES FOR EACH EMS ORGANIZATION TYPE





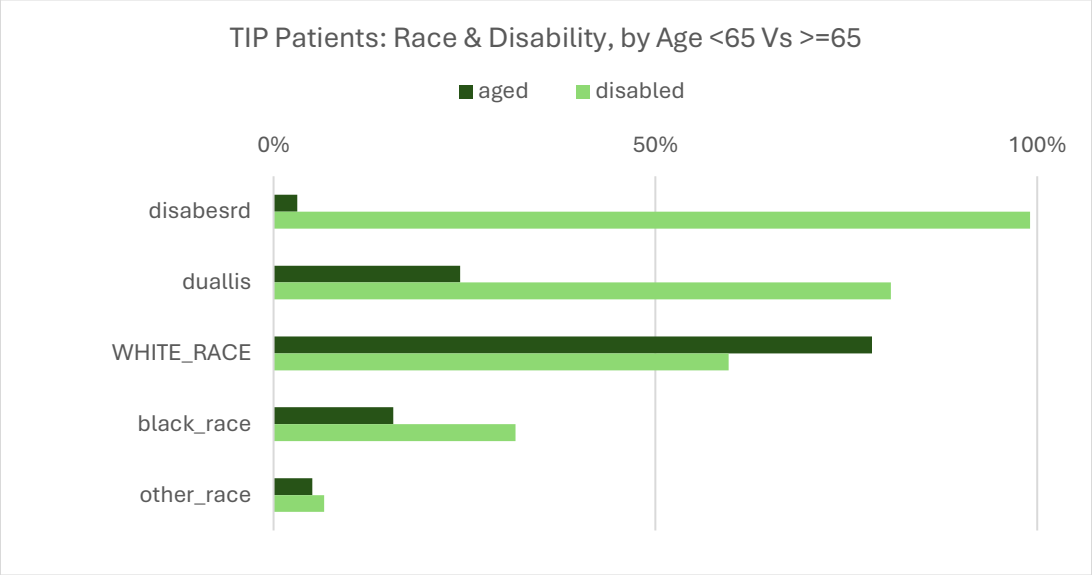




Notes:
Data in the exhibit are based on 185 ET3 participant organizations with a signed participation agreement of one month or more. Annual data reflect Medicare FFS emergency ambulance transport claims for services provided by ET3 participant organizations between January 1, 2021 and December 31, 2023.

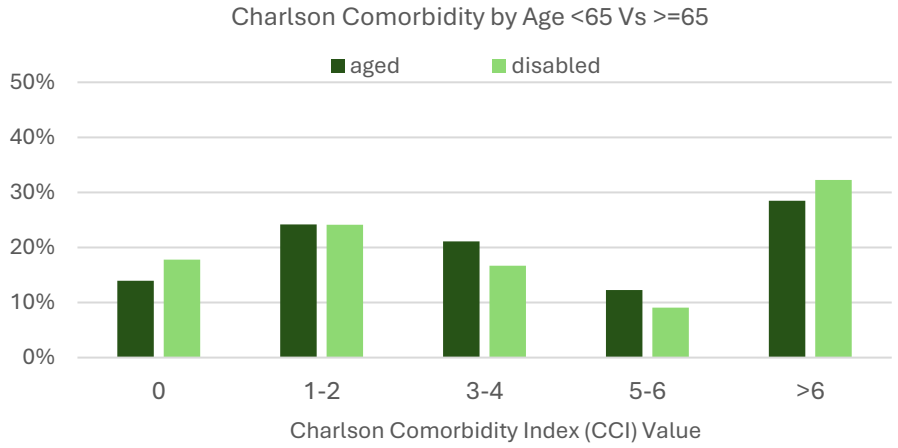
APPENDIX E. SUPPLEMENTARY CONTENT FOR CHAPTER ON DESCRIPTIVE CHARACTERISTICS OF TIP AND TAD INTERVENTIONS

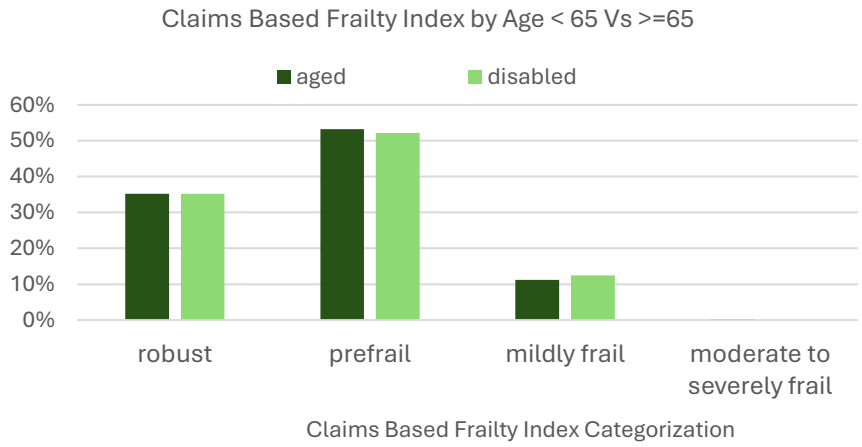
EXHIBIT E1. DISABLED (N=423) AND AGED (N=2,317) MEDICARE BENEFICIARY RECIPIENTS OF TIP INTERVENTIONS: RACE, DISABILITY AND ESRD STATUS, DUAL ELIGIBILITY AND LIS STATUS



Notes: Proportions in the graph reflect 2,740 beneficiaires that received TIP interventions during the ET3 Model's perfpormance period. Abbreviations: disabesrd, disabled or ESRD; duallis, dually eligible or LIS recipient.

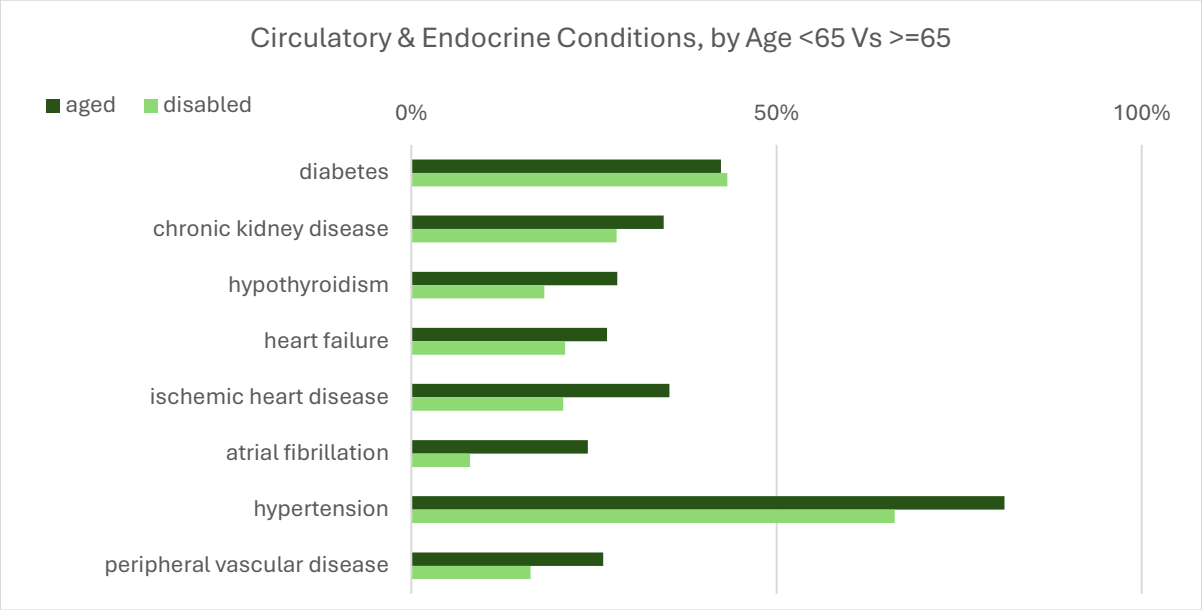
EXHIBIT E2. TIP INTERVENTIONS TO DISABLED (N=539) AND AGED BENEFICIARIES (N=2,622): CHARLSON COMORBIDITY INDEX AND CLAIMS BASED FRAILTY INDEX

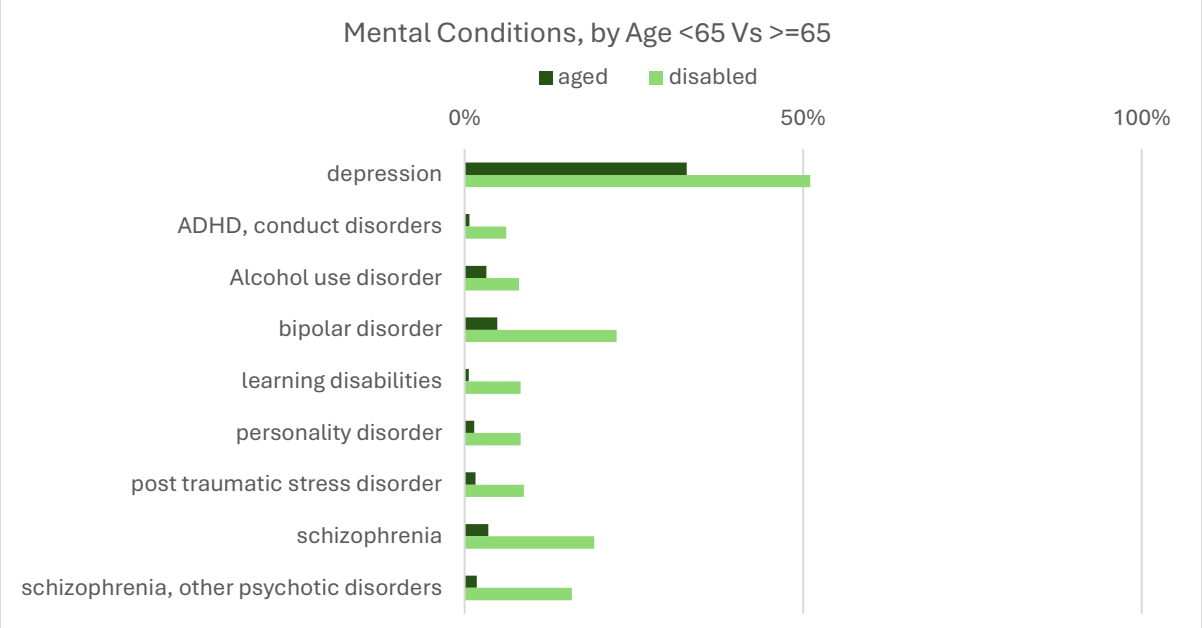




Notes: Percentages in the exhibit reflect frequencies of EMS episodes since the Charlson comorbidity index and frailty index are created using the claims history over the 12 months preceding an index event.

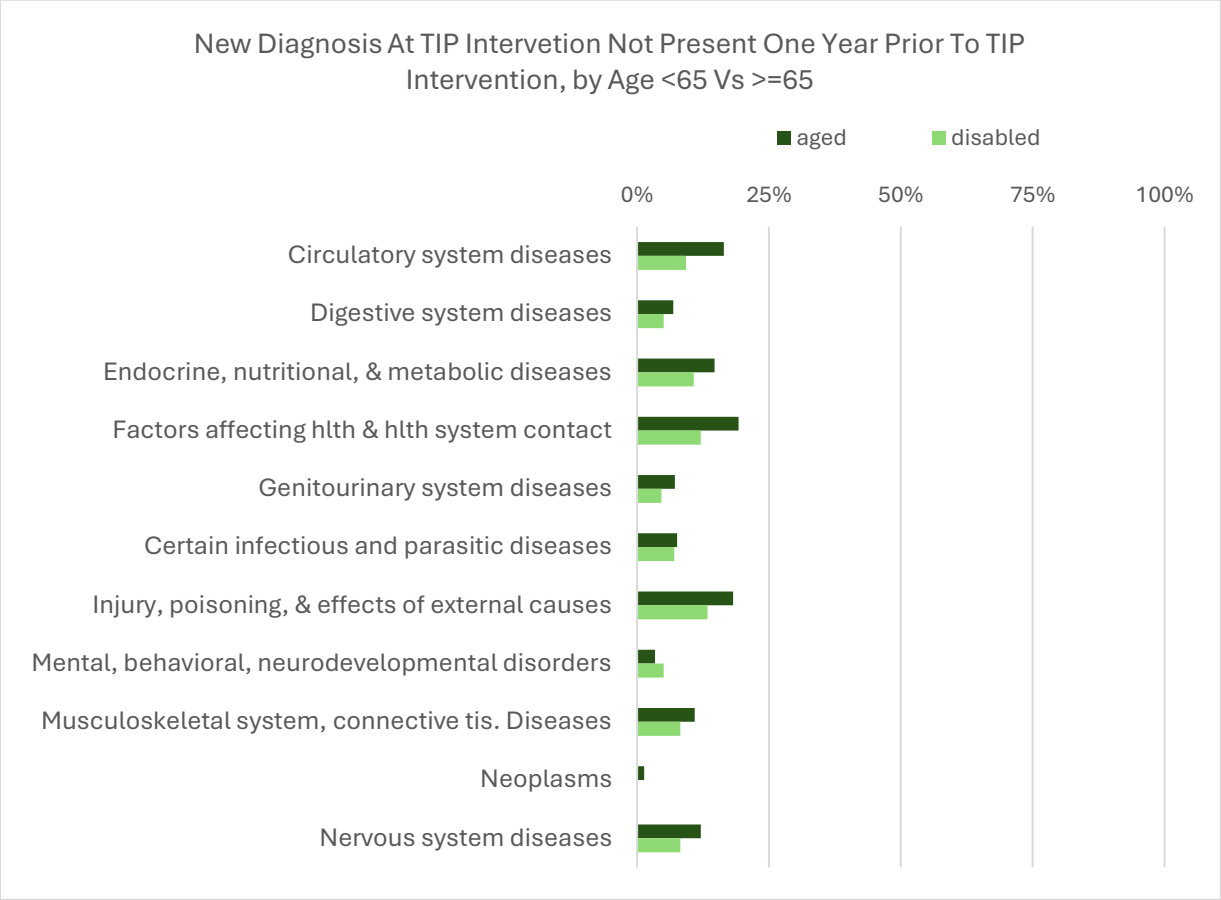
EXHIBIT E3. DISABLED (N=423) AND AGED (N=2,317) MEDICARE BENEFICIARY RECIPIENTS OF TIP INTERVENTIONS: PREVALENCE OF CHRONIC HEART, CIRCULATORY, ENDOCRINE AND MENTAL HEALTH CONDITIONS





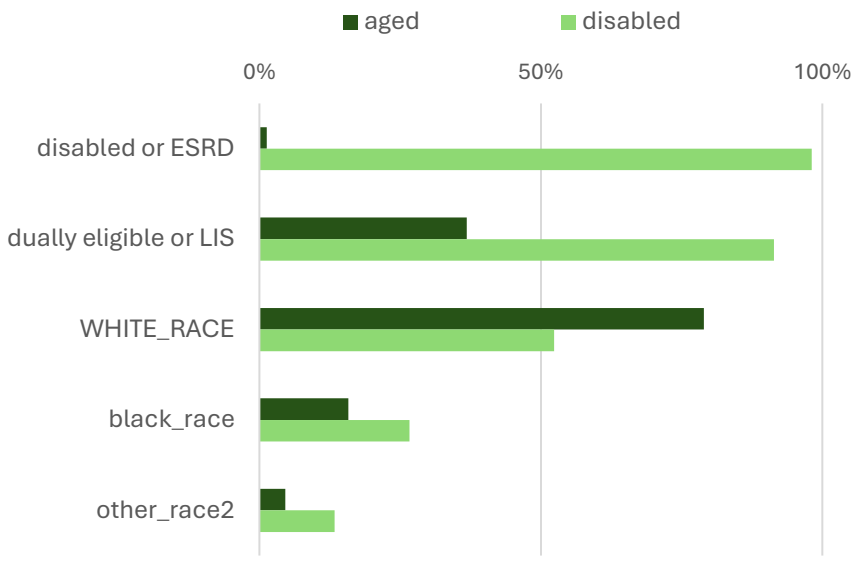
Notes: Proportions in the graph reflect 2,740 beneficiaires that received TIP interventions during the ET3 Model's perfpormance period.

EXHIBIT E4. TIP INTERVENTIONS TO DISABLED (N=539) AND AGED BENEFICIARIES(N=2,622): PREVALENCE OF NEW DIAGNOSIS AT TIME OF TIP INTERVENTION RELATIVE TO ONE YEAR PRIOR USING CCSR CONDITION CATEGORIES



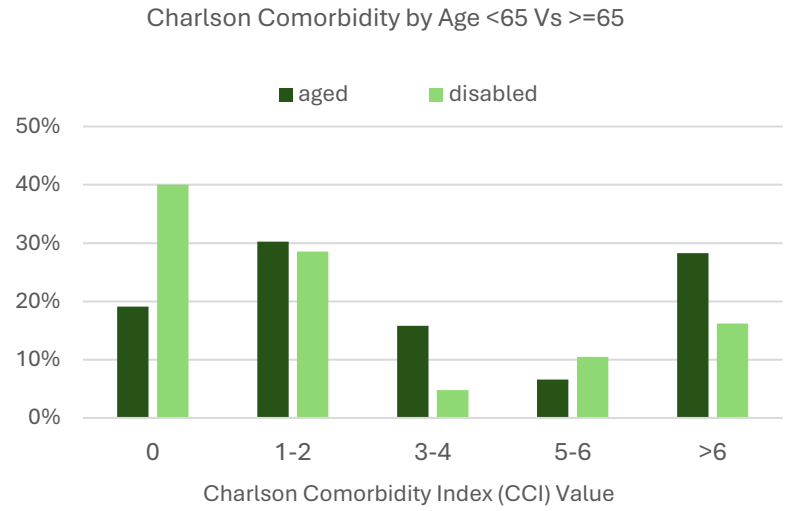
Notes: Percentages in the exhibit reflect frequencies of EMS episodes to aged or disabled beneficiaries.

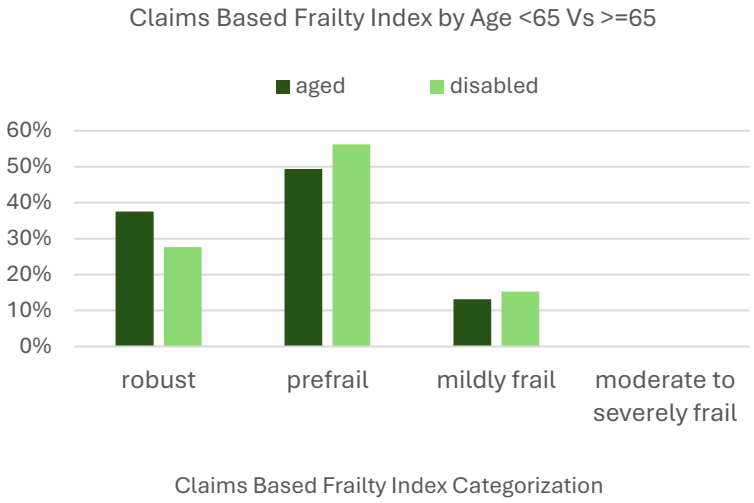
EXHIBIT E5. DISABLED (N=89) AND AGED (N=144) MEDICARE BENEFICIARY RECIPIENTS OF TAD INTERVENTIONS: RACE, DISABILITY AND ESRD STATUS, DUAL ELIGIBILITY AND LIS STATUS



Notes: Proportions in the graph reflect 233 beneficiaires that received TAD interventions during the ET3 Model's perfpormance period. Abbreviations: disabesrd, disabled or ESRD; duallis, dually eligible or LIS recipient.

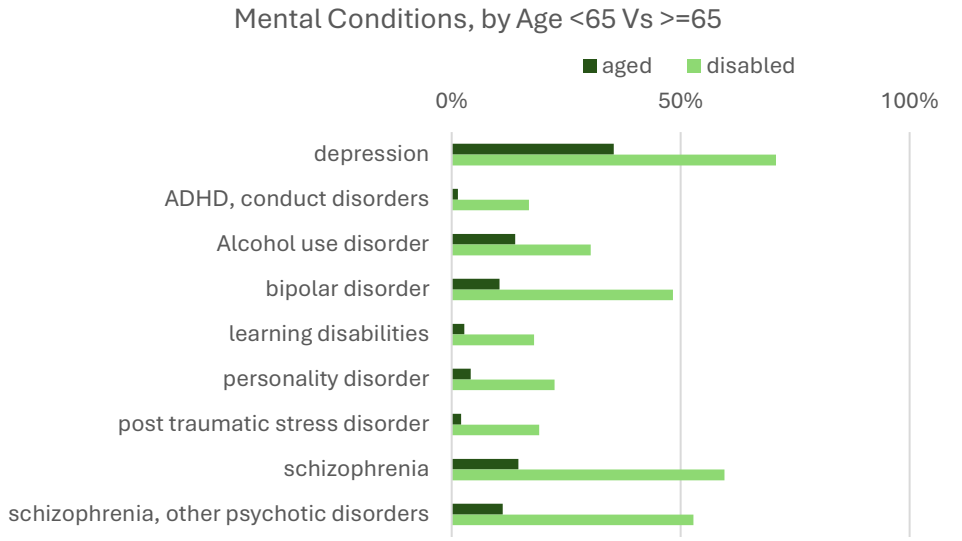
EXHIBIT E6. TAD INTERVENTIONS TO DISABLED (N=105) AND AGED (N=152) MEDICARE BENEFICIARY RECIPIENTS: CHARLSON COMORBIDITY INDEX AND CLAIMS BASED FRAILTY INDEX

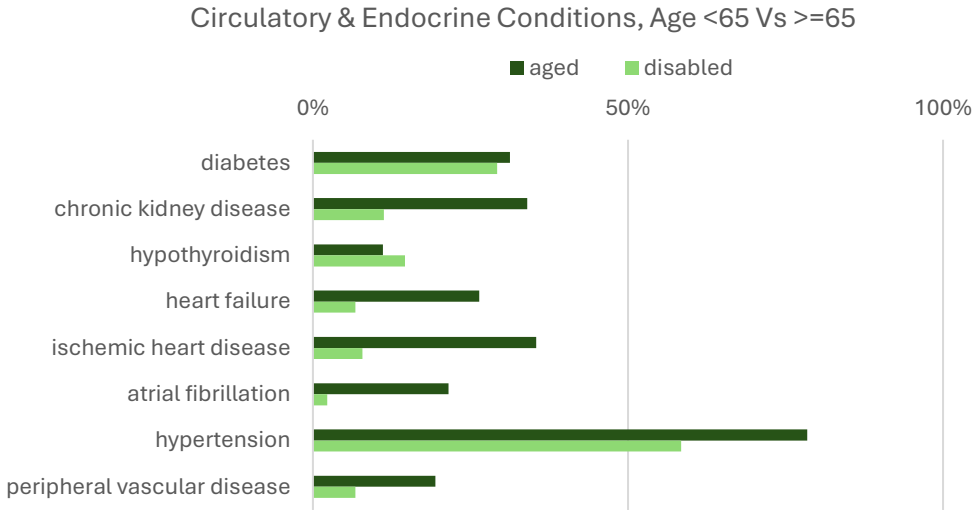




Notes: Percentages in the exhibit reflect frequencies of EMS episodes to aged or disabled patients. The Charlson comorbidity index and frailty index are created using the claims history over the 12 months preceding an index event.

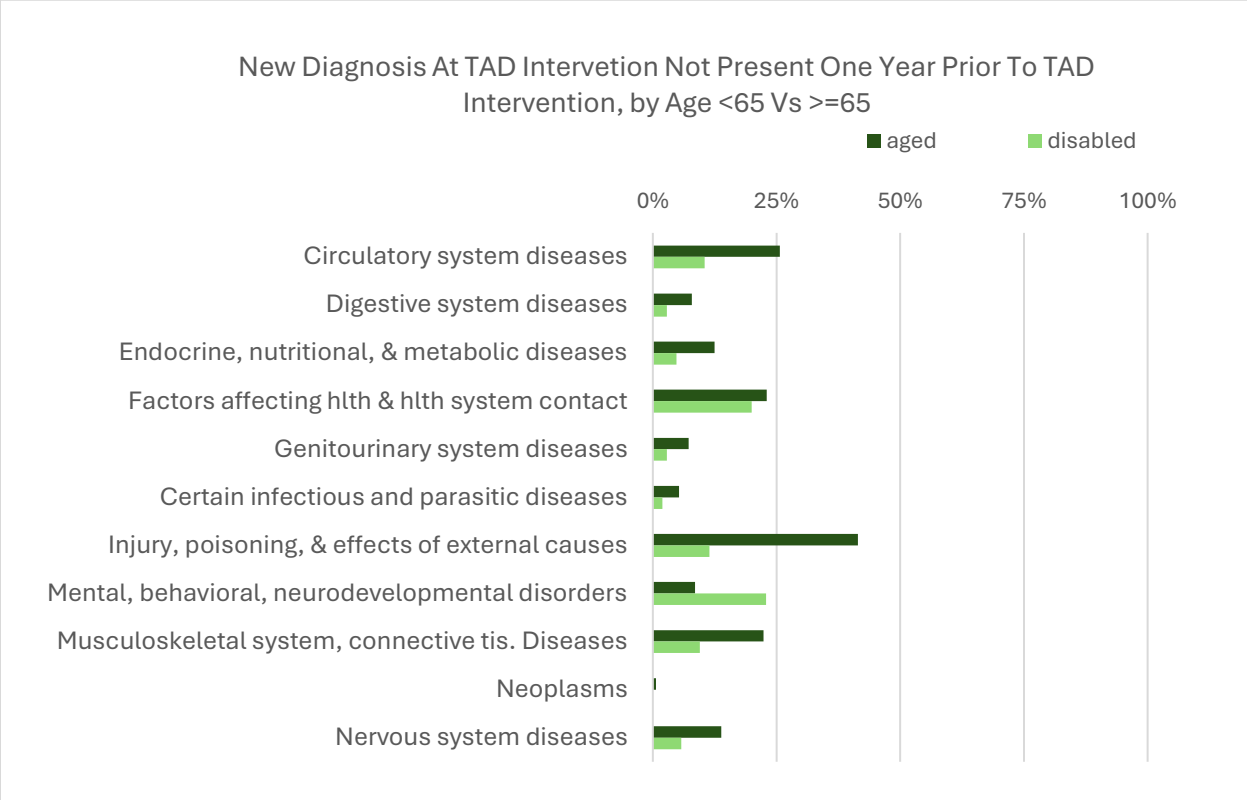
EXHIBIT E7. DISABLED (N=89) AND AGED MEDICARE BENEFICIARY RECIPIENTS (N=144) OF TAD INTERVENTIONS: PREVALENCE OF CHRONIC HEART, CIRCULATORY, ENDOCRINE AND MENTAL HEALTH CONDITIONS





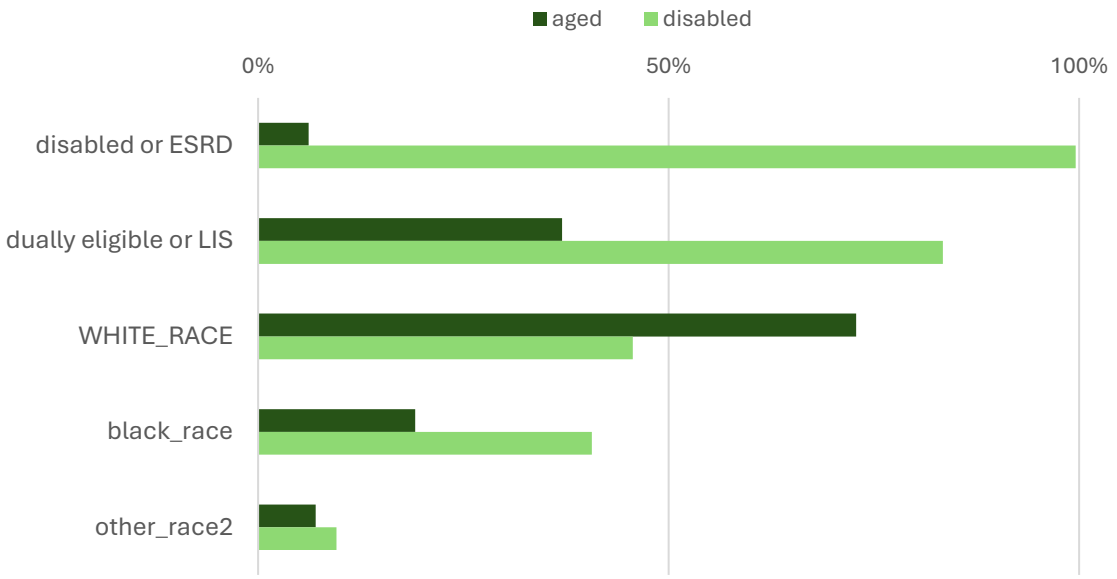
Notes: Proportions in the graph reflect 233 beneficiaires that received TAD interventions during the ET3 Model's perfpormance period.

EXHIBIT E8. DISABLED AND AGED MEDICARE BENEFICIARY RECIPIENTS OF TAD INTERVENTIONS: PREVALENCE OF NEW DIAGNOSIS AT TIME OF TAD INTERVENTION RELATIVE TO ONE YEAR PRIOR USING CCSR CONDITION CATEGORIES



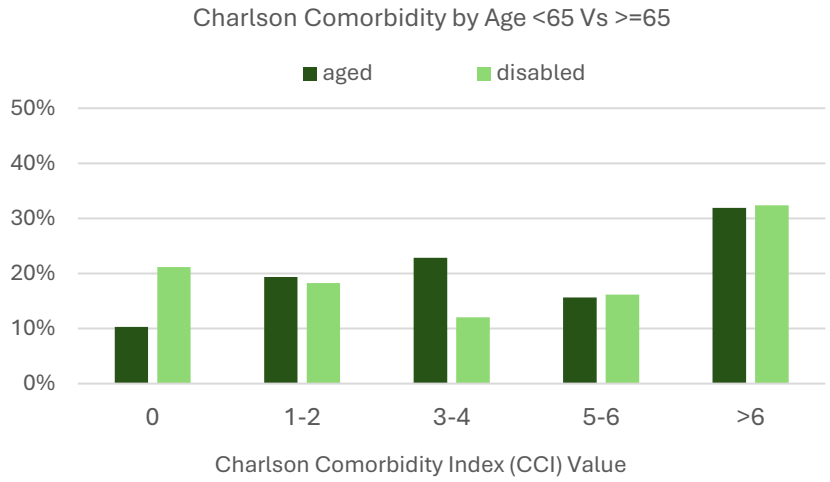
Notes: Percentages in the exhibit reflect frequencies of EMS episodes to aged or disabled beneficiaries.

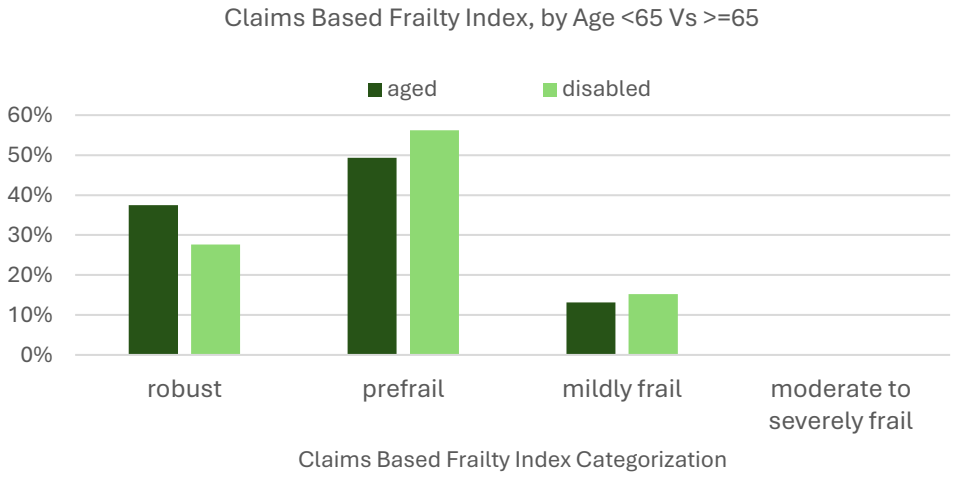
EXHIBIT E9. DISABLED (N=176) AND AGED (N=450) MEDICARE PATIENTS WITH ED VISITS FOLLOWING PATIENT REFUSAL OF ET3 INTERVENTIONS: RACE, DISABILITY AND ESRD STATUS, DUAL ELIGIBILITY AND LIS STATUS



Notes: Proportions in the graph reflect 626 beneficiaires that received TIP interventions during the ET3 Model's perfpormance period.

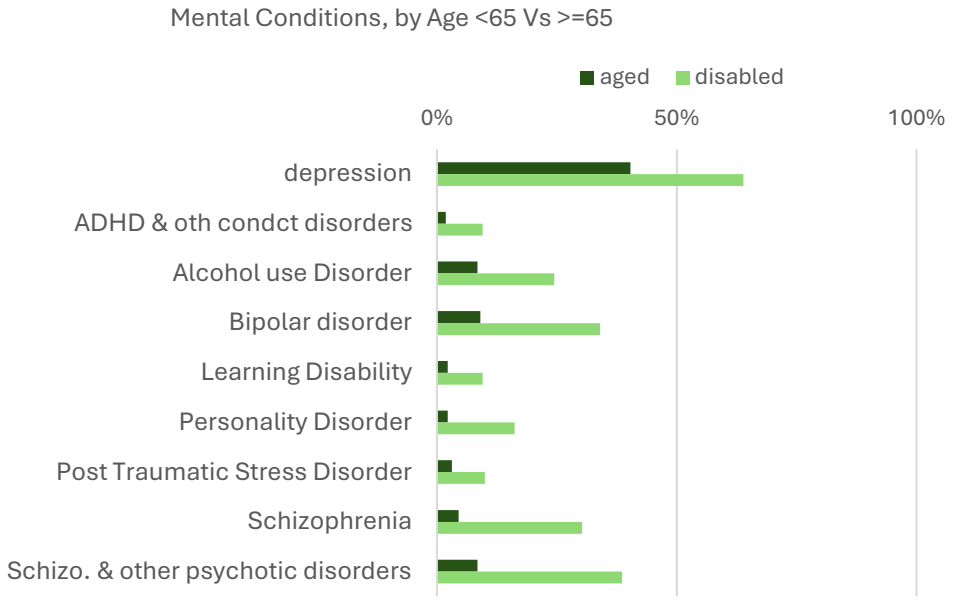
EXHIBIT E10. ED EMS EPISODES TO DISABLED (N=241) AND AGED (N=486) MEDICARE BENEFICIARIES AFTER PATIENTS REFUSED ET3 INTERVENTIONS: CHARLSON COMORBIDITY INDEX AND CLAIMS BASED FRAILTY INDEX

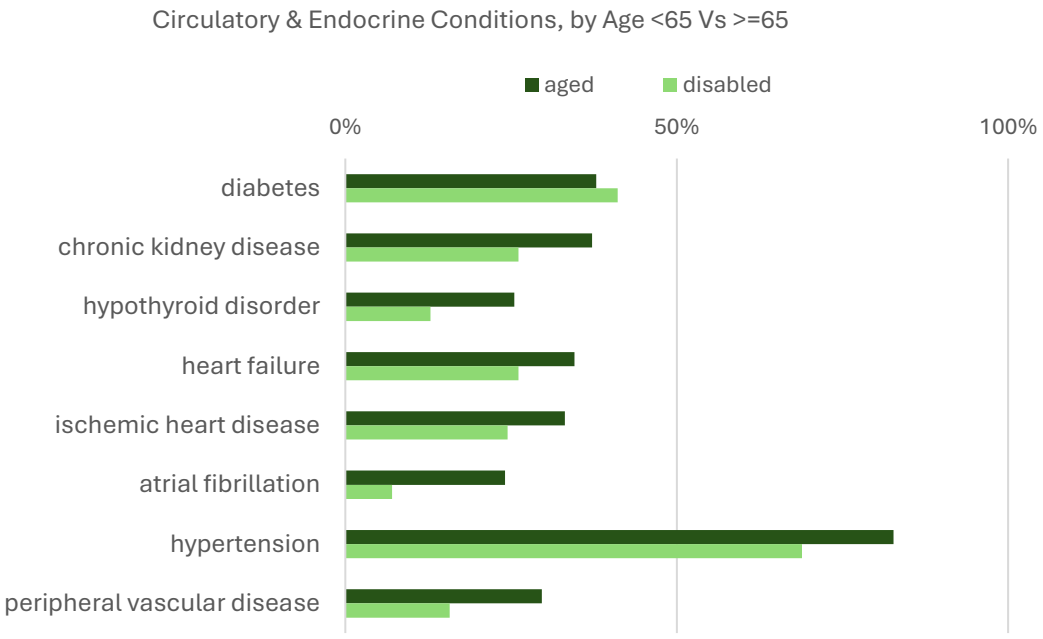




Notes: Percentages in the exhibit reflect frequencies of EMS episodes since the Charlson comorbidity index and frailty index are created using the claims history over the 12 months preceding an index event.

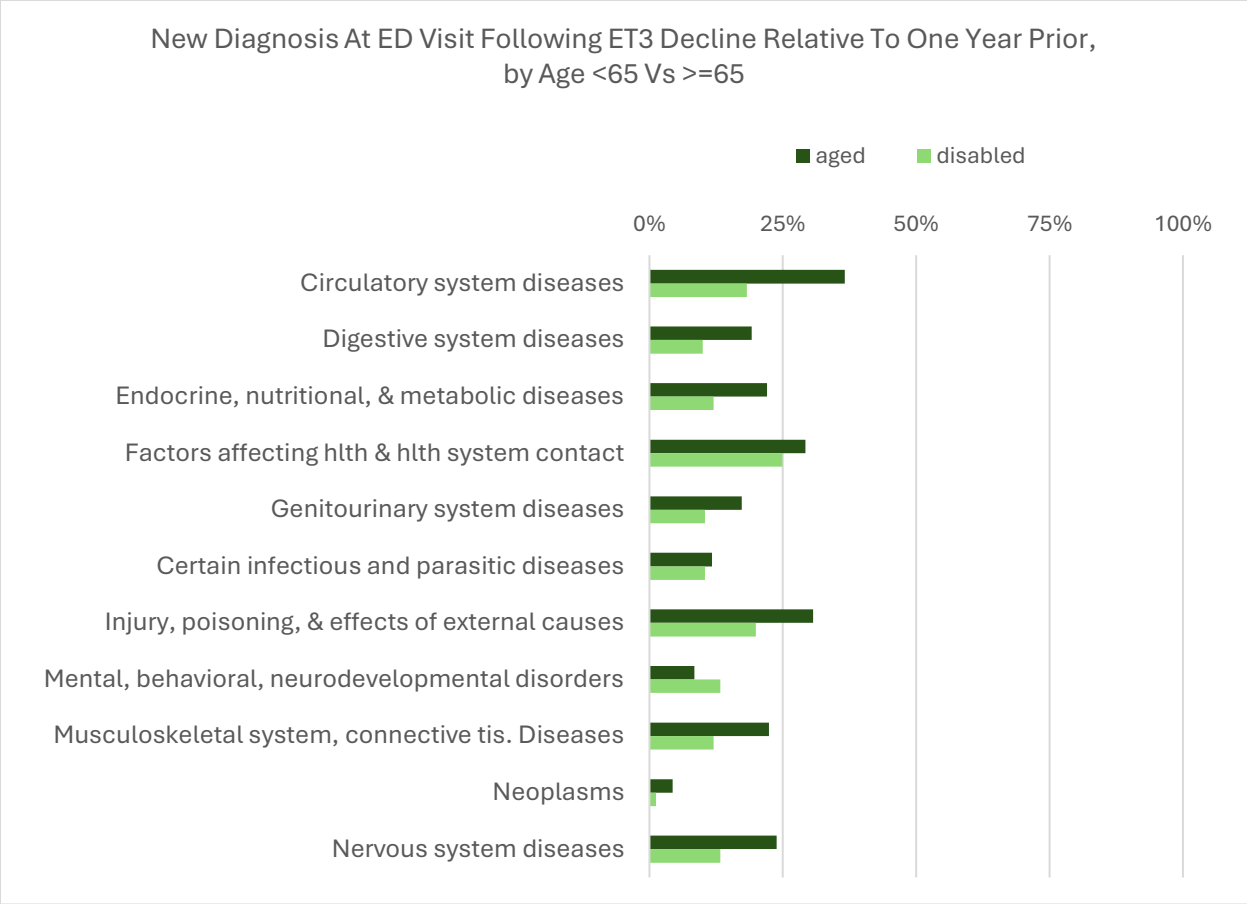
EXHIBIT E11. DISABLED (N=176) AND AGED (N=450) MEDICARE PATIENTS WITH ED VISITS FOLLOWING PATIENT REFUSAL OF ET3 INTERVENTIONS: PREVALENCE OF CHRONIC HEART, CIRCULATORY, ENDOCRINE AND MENTAL HEALTH CONDITIONS





Notes: Proportions in the graph reflect 450 aged or 176 disabled beneficiaries with ED episodes following patient decline of an ET3 intervention.

EXHIBIT E12. ED EMS EPISODES TO DISABLED (N=241) AND AGED (N=486) MEDICARE BENEFICIARIES AFTER PATIENTS REFUSED ET3 INTERVENTIONS: PREVALENCE OF NEW DIAGNOSIS AT TIME OF ED VISIT RELATIVE TO ONE YEAR PRIOR USING CCSR CONDITION CATEGORIES



Notes: Proportions in the exhibit reflect frequencies of EMS episodes for ED visits following a patient decline of an ET3 intervention.

EXHIBIT E13. TOP THREE CLINICAL CONDITIONS WITHIN DIAGNOSTIC CCSR CATEGORIES COMMON AMONG TIP INTERVENTIONS

CCSR Condition Category	Most Common Three Conditions Within Category
CIR	**Essential hypertension** **Nonspecific chest pain** Cardiac dysrhythmias
END	**Diabetes mellitus with complication** **Diabetes mellitus, Type 2** **Fluid and electrolyte disorders**
INJ	**Other unspecified injury** Superficial injury; contusion, initial encounter Open wounds to limbs, initial encounter
MUS	**Musculoskeletal pain, not low back pain** **Low back pain** Spondylopathies/spondyloarthropathy (including infective)
RSP	**Chronic obstructive pulmonary disease and bronchiectasis** Respiratory failure; insufficiency; arrest Pneumonia (except that caused by tuberculosis)
NVS	**Nervous system pain and pain syndromes** Headache; including migraine Coma; stupor; and brain damage
FAC	**Exposure, encounters, screening or contact with infectious disease** Other specified status Implant, device or graft related encounter

Notes: CCSR condition categories listed in the table are the seven most common categories occurring among all TIP interventions. Conditions within a category are ordered starting with the most frequently occurring condition among TIP interventions within the given CCSR category. Conditions in boldface account for 20% or more of TIP interventions within a CCSR condition category.

EXHIBIT E14. TOP THREE INDIVIDUAL CONDITIONS WITHIN COMMON DIAGNOSTIC CCSR CATEGORIES FOR TAD INTERVENTIONS

CCSR Condition Category	Condition
INJ	**Other unspecified injury**
	Open wounds to limbs, initial encounter
	Superficial injury; contusion, initial encounter
MBD	**Schizophrenia spectrum and other psychotic disorders**
	Suicidal ideation/attempt/intentional self-harm
	Depressive disorders
MUS	**Musculoskeletal pain, not low back pain**
	Osteoarthritis
	Low back pain
CIR	**Nonspecific chest pain**
	Essential hypertension
	Cardiac dysrhythmias
NVS	**Headache; including migraine**
	Neurocognitive disorders
	Polyneuropathies
FAC	**Exposure, encounters, screening or contact with infectious disease**
	Medical examination/evaluation
	Other aftercare encounter
RSP	**Pneumonia (except that caused by tuberculosis)**
	Pleurisy, pleural effusion and pulmonary collapse
	Chronic obstructive pulmonary disease and bronchiectasis

Notes: CCSR condition categories are seven most common categories occurring among all TAD interventions. Conditions are ordered starting with mostly commonly occurring condition among TAD interventions within the given CCSR condition category. Conditions listed in boldface account for 20% or more of TAD interventions within a CCSR condition category.

APPENDIX F. SUPPLEMENTARY CONTENT FOR CHAPTER ON DESCRIPTIVE OUTCOMES OF TIP AND TAD INTERVENTIONS

EXHIBIT F1. TOP THREE INDIVIDUAL CONDITIONS FOR TIP INTERVENTIONS FOLLOWED BY AN ED VISIT WITHIN 5 DAYS OF INDEX DATE, BY CCSR CATEGORY

(Top listed CCSR category is most frequently occurring and bottom listed CCSR category is the least common)

CCSR Condition Category	Condition
CIR	Nonspecific chest pain
	Essential hypertension
	Cardiac dysrhythmias
RSP	Chronic obstructive pulmonary disease and bronchiectasis
	Respiratory failure; insufficiency; arrest
	Pleurisy, pleural effusion and pulmonary collapse
FAC	Exposure, encounters, screening or contact with infectious disease
	Implant, device or graft related encounter
	Encounter for observation and examination for conditions ruled out
GEN	**Urinary tract infections**
	Acute and unspecified renal failure
	Chronic kidney disease
INF	**Coronavirus disease 2019 (COVID-19)**
	Bacterial infections
	Septicemia
DIG	Other specified and unspecified gastrointestinal disorders
	Biliary tract disease
	Other specified and unspecified liver disease
MBD	**Anxiety and fear-related disorders**
	Depressive disorders
	Schizophrenia spectrum and other psychotic disorders

Notes: CCSR condition categories listed had the highest 5-Day ED visit rate and at least 50 TIP encounters in the ratio numerator and denominator. Individual conditions are ordered starting with the most frequently occurring condition among TIP interventions in a given CCSR condition category. Conditions listed in boldface account for 20% or more of 5-Day ED visits in the CCSR condition category.

EXHIBIT F2. TOP THREE INDIVIDUAL CONDITIONS FOLLOWED HOSPITALIZATION WITHIN 5 DAYS OF DATE OF TIP INTERVENTION, BY TIP CCSR CATEGORY

(Top listed CCSR category is most frequently occurring and bottom listed CCSR category is the least common.)

CCSR Condition Category	Condition
CIR	Nonspecific chest pain
	Cardiac dysrhythmias
	Essential hypertension
RSP	Respiratory failure; insufficiency; arrest
	Pleurisy, pleural effusion and pulmonary collapse
	Chronic obstructive pulmonary disease and bronchiectasis
FAC	Exposure, encounters, screening or contact with infectious disease
	Implant, device or graft related encounter
	Encounter for observation and examination for conditions ruled out
GEN	Acute and unspecified renal failure
	Urinary tract infections
	Chronic kidney disease
INF	Bacterial infections
	Coronavirus disease 2019 (COVID-19)
	Septicemia
DIG	Other specified and unspecified gastrointestinal disorders
	Biliary tract disease
	Other specified and unspecified liver disease
SKN	Skin and subcutaneous tissue infections
	Other specified inflammatory condition of skin
	Pressure ulcer of skin

Notes: CCSR condition categories listed had the highest occurrence of a hospitalization within 5 days after the date of TIP, with at least 50 TIP encounters in the ratio numerator and denominator. Individual conditions are ordered starting with the most frequently occurring condition among TIP interventions in a given CCSR condition category. Conditions listed in boldface account for 20% or more of 5-Day ED visits in the CCSR condition category.

EXHIBIT F3. TOP THREE INDIVIDUAL CONDITIONS FOR TAD FOLLOWED BY ED VISITS WITHIN 5 DAYS OF DATE OF TAD INTERVENTION

CCSR Condition Category	Condition
MBD	**Schizophrenia spectrum and other psychotic disorders**
	Depressive disorders
	Bipolar and related disorders

Notes: The CCSR condition category listed had the highest 5-Day ED visit rate and at least 50 TIP encounters in the ratio numerator and denominator. Individual conditions are ordered starting with the most frequently occurring condition among TIP interventions in a given CCSR condition category. Conditions listed in boldface account for 20% or more of 5-Day ED visits in the CCSR condition category.

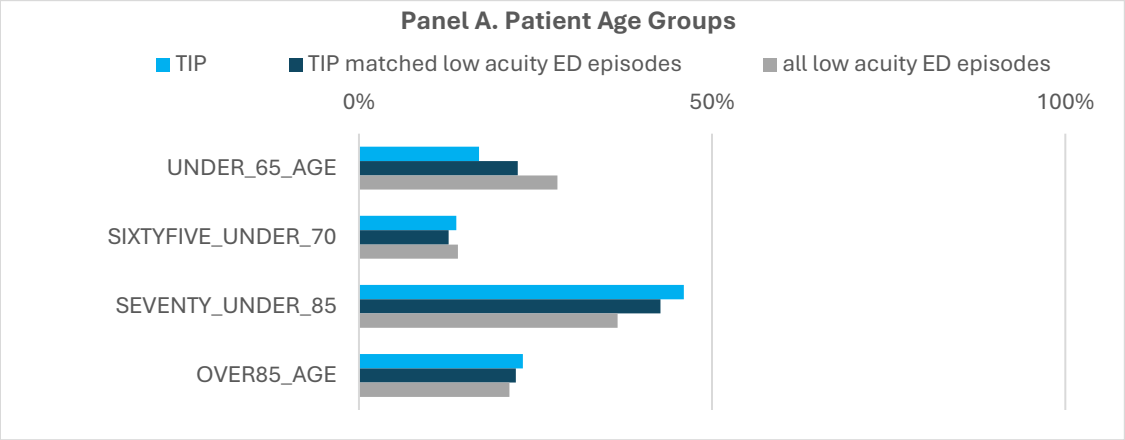
APPENDIX G. SUPPLEMENTARY CONTENT FOR CHAPTER ON RISK ADJUSTED OUTCOMES FOLLOWING TIP INTERVENTIONS

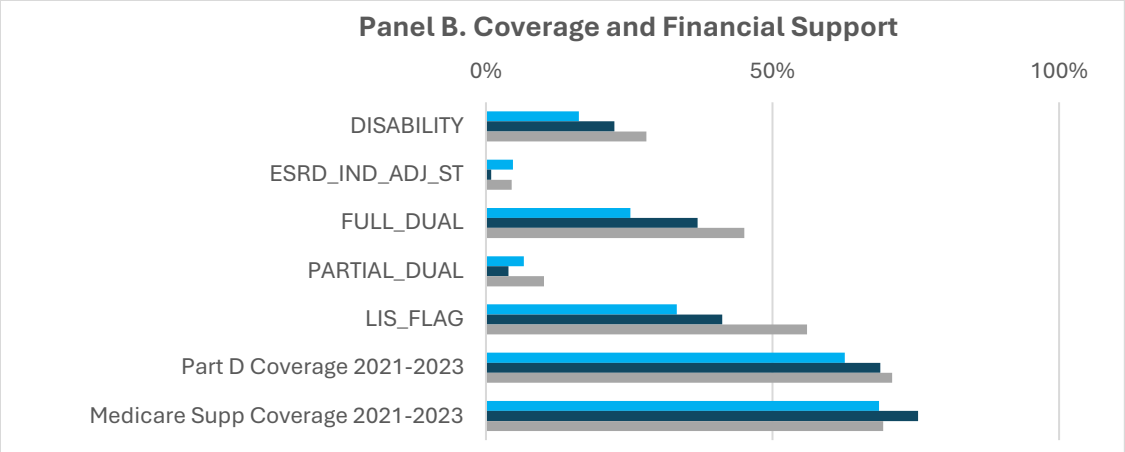
Comparison of TIP Interventions, Low Acuity ED Interventions, and TIP Matched Low Acuity ED Interventions

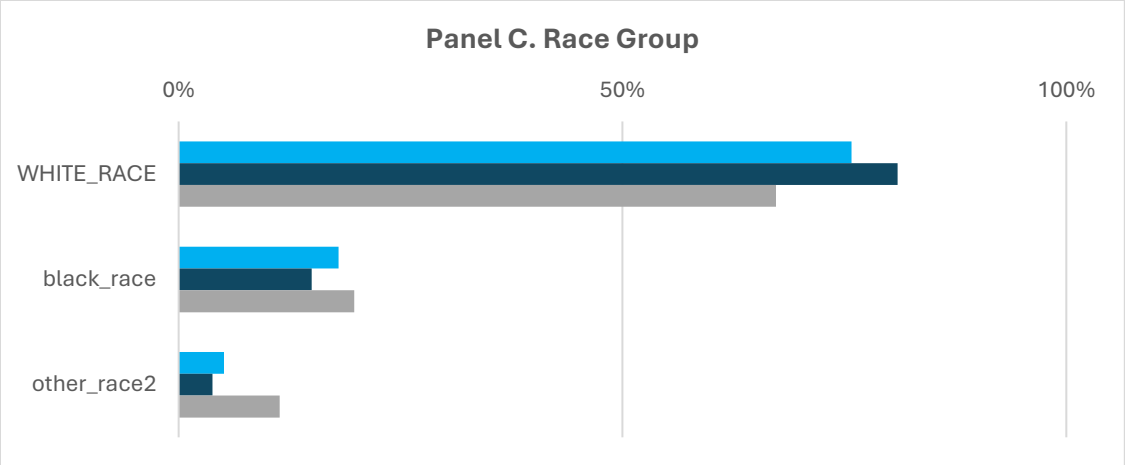
This section of the appendix presents comparisons of characteristics of TIP interventions, TIP matched low acuity ED episodes, and all low acuity ED episodes. See Appendix B for details on the methodology used to identify TIP matched low acuity ED episodes. Comparisons in this section using TIP matched low acuity ED episodes do not apply entropy balancing weights that reflect clinical differences between episodes.

Low acuity ED episodes matched to TIP recipients (N=32,408) are more comparable to TIP interventions in select demographic, coverage, spending, and comorbidity characteristics relative to all low acuity ED episodes (N=138,928), but differences remain (Exhibit G1). Comparisons among the three populations show improvement in the proportion that are aged (TIP vs TIP matched vs all low acuity ED: 83% vs 78% vs 72%) and disabled (17% vs 23% vs 28%). Among demographic, race, and coverage characteristics, comparison of standardized mean differences showed differences of 0.20 or greater only for the proportion of patients with ESRD and the proportion of dually eligible patients.

EXHIBIT G1. DEMOGRAPHIC AND COVERAGE CHARACTERISTICS OF TIP INTERVENTIONS (N=3,161), LOW ACUITY ED EPISODES MATCHED TO TIP INTERVENTIONS (N=32,408) AND ALL LOW ACUITY ED EPISODES (N=138,928)

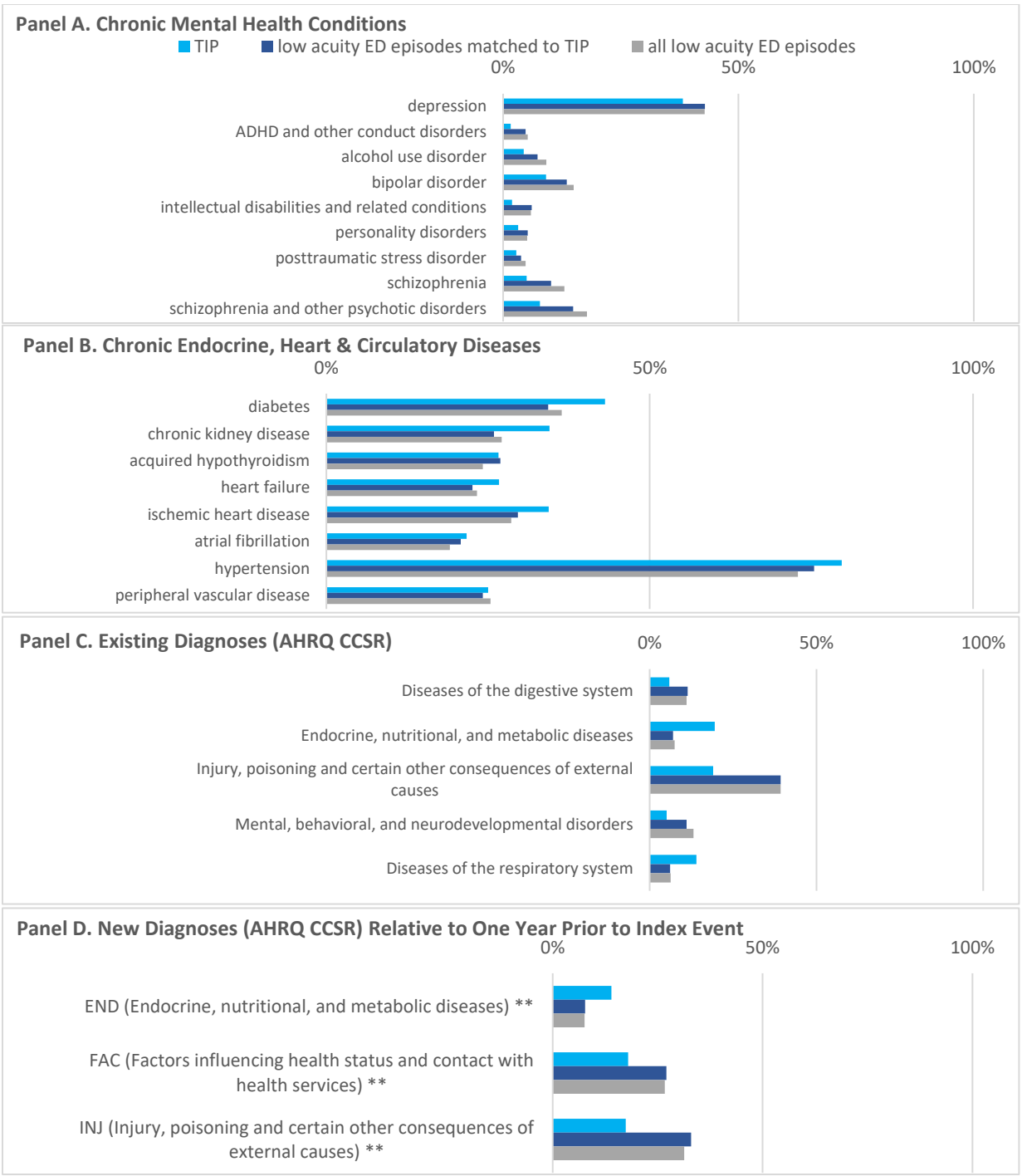






Differences in chronic mental health, endocrine, circulatory, and heart conditions are mostly smaller between TIP interventions and TIP matched low acuity ED episodes relative to TIP interventions and all low acuity ED episodes (see Exhibit G2). While there were modest improvements in rates of chronic conditions as shown in panel A and panel B, differences remained in existing CCSR clinical condition categories as well as new diagnoses relative to one year prior to index.

EXHIBIT G2. COMPARISON OF CLINICAL DIAGNOSES BETWEEN TIP, TIP MATCHED LOW ACUITY ED EPISODES, AND ALL LOW ACUITY ED EPISODES



Notes: Exhibit panels present comparisons between patient characteristics of TIP interventions and matched low acuity ED episodes. Matched low acuity ED episodes were identified from patients that were matched to TIP intervention patients on gender; age group; race/ethnicity group; disability/ESRD group; and dual eligibility/LIS/Medicare supplemental coverage group.