



Tracking and Preventing Outpatient Procedural Complications

PCSI 2024



Background: Outpatient procedures and quality



- >70% procedures performed in outpatient settings¹



- Limited outcomes/quality measurement systems



- 3M AM-PPCs first comprehensive quality outcomes system for ambulatory procedures

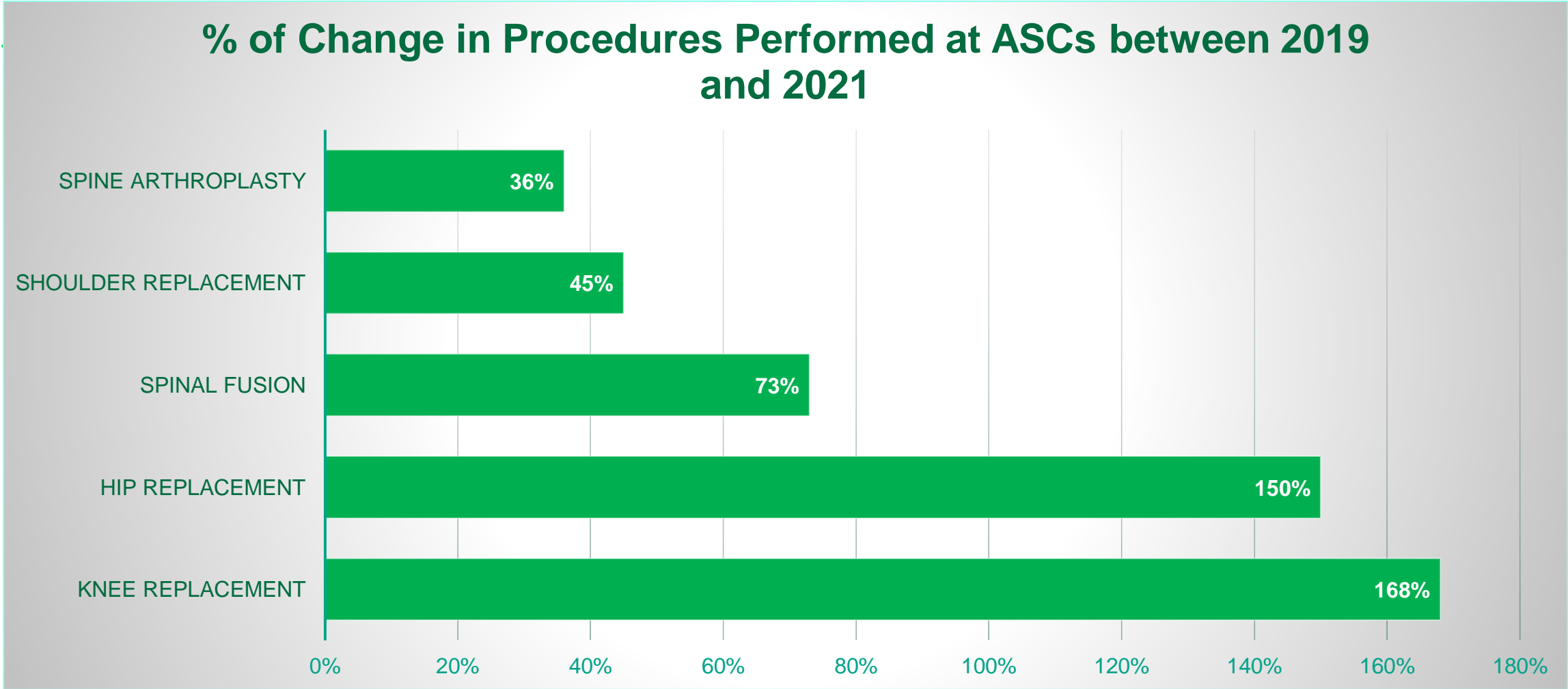


- Solventum trusted objective secure data methodologies

Source:

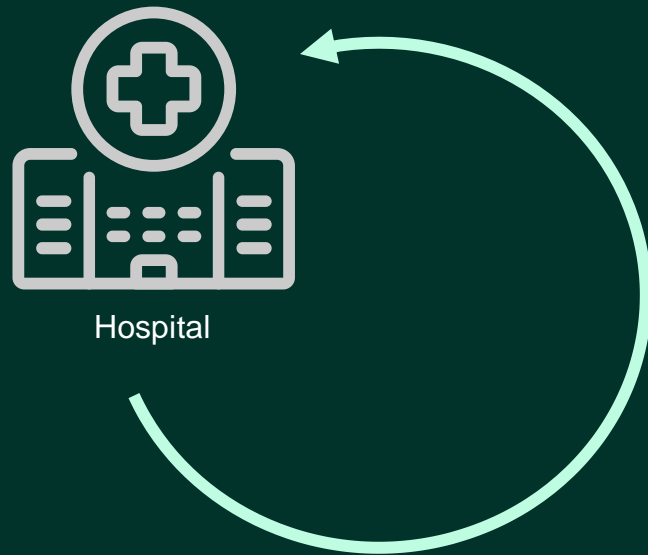
¹July 2017 report from the Centers for Medicare & Medicaid Services (CMS)

Outpatient procedure trends

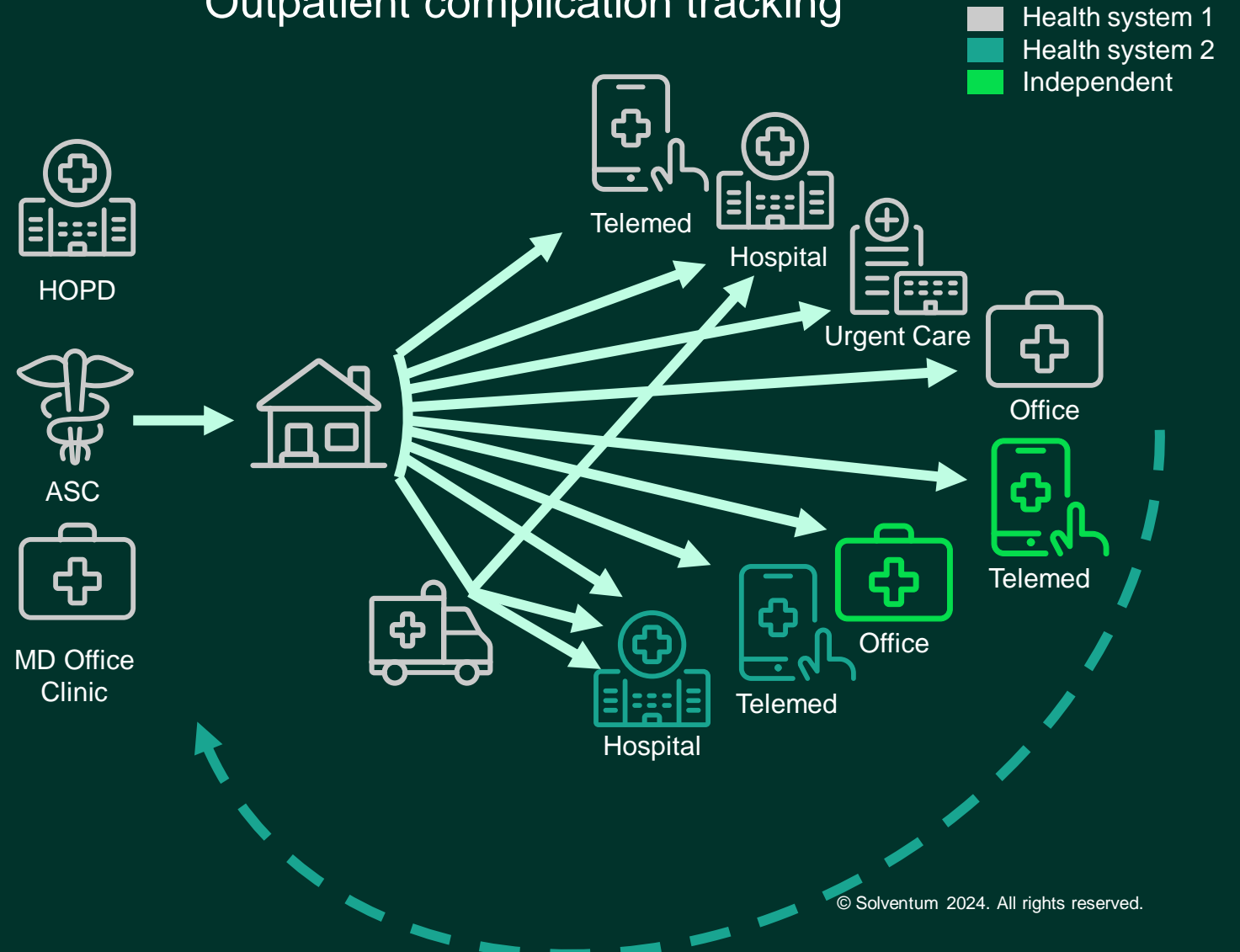


Challenge with outpatient safety tracking

Inpatient complication tracking



Outpatient complication tracking



Impact of complications

- **Post Procedure Adverse Events**
 - Challenging to systematically analyze
 - Contributes to impaired recovery, excess pain and suffering, negative patient experience
 - Professional edict to “do no harm”
 - Litigation costs
 - Reputation
 - Insurance premiums and inclusion in care networks
- **VBC Costs**
 - Excess emergency department / inpatient admission for complication care
 - Staff time MD / RN / ancillary services / consultants /supplies
 - Loss of reimbursement or penalties

- What do we need to know?



AM-PPCs Value Propositions



Procedure Groups

Complication groups

Quality / Safety Policies

Practice Area

Service Line

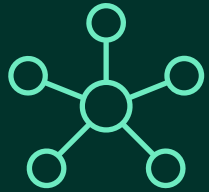
Public	What is the actual risk?	What are the complications associated with this procedure?	Standards of care and safety. Comprehensive trustable actionable outpatient data.	Is this a good place to have a procedure; HOPD, ASC,OP?	Which group has the best outcomes?
Payer	What procedures are high risk?	How many members are expected to go to ED or be admitted IP?	Are my members getting quality care? Do I reimburse for quality/value?	Do we pay better for better outcomes? Should this be inpatient only?	Should we partner with this group?
Hospital /System	What are our actual to expected rates?	Where do we focus on improvement?	How do we compare in the market?	Are providing the same care pathways, education?	Should we use these metrics for practice agreements?
Provider	Compare like procedures to peers	Truly informed consent	Focus on prevention in my practice	Should I bring my patients here?	Am I doing as well as my peers?

3M AM-PPCs definition

Harmful events (e.g., accidental laceration) or negative outcomes (e.g., sepsis) that develop after an **elective procedure** was performed in the **ambulatory care setting** and that may result from processes of care and treatment rather than from natural progression of an underlying illness and are therefore potentially preventable

Source: 3M AM-PPC Definitions Manual

Logic to developing 3M AM-PPCs



110 PSGs

- 2905 procedures with a risk for a complication
- 5 Oncology cohorts
- Started anatomically
- Risk/complexity grouping
- Clinical procedure risk hierarchy
- Chained – 30 days
- Examples: colonoscopies, upper GI endoscopy, cataracts, arthroscopies, biopsies



59 complication groups

- 1,211 unique complications
- Complications plausibly related to procedure
- Timing limits
- Examples: Sepsis, UTI, bleeding, wound dehiscence, infection

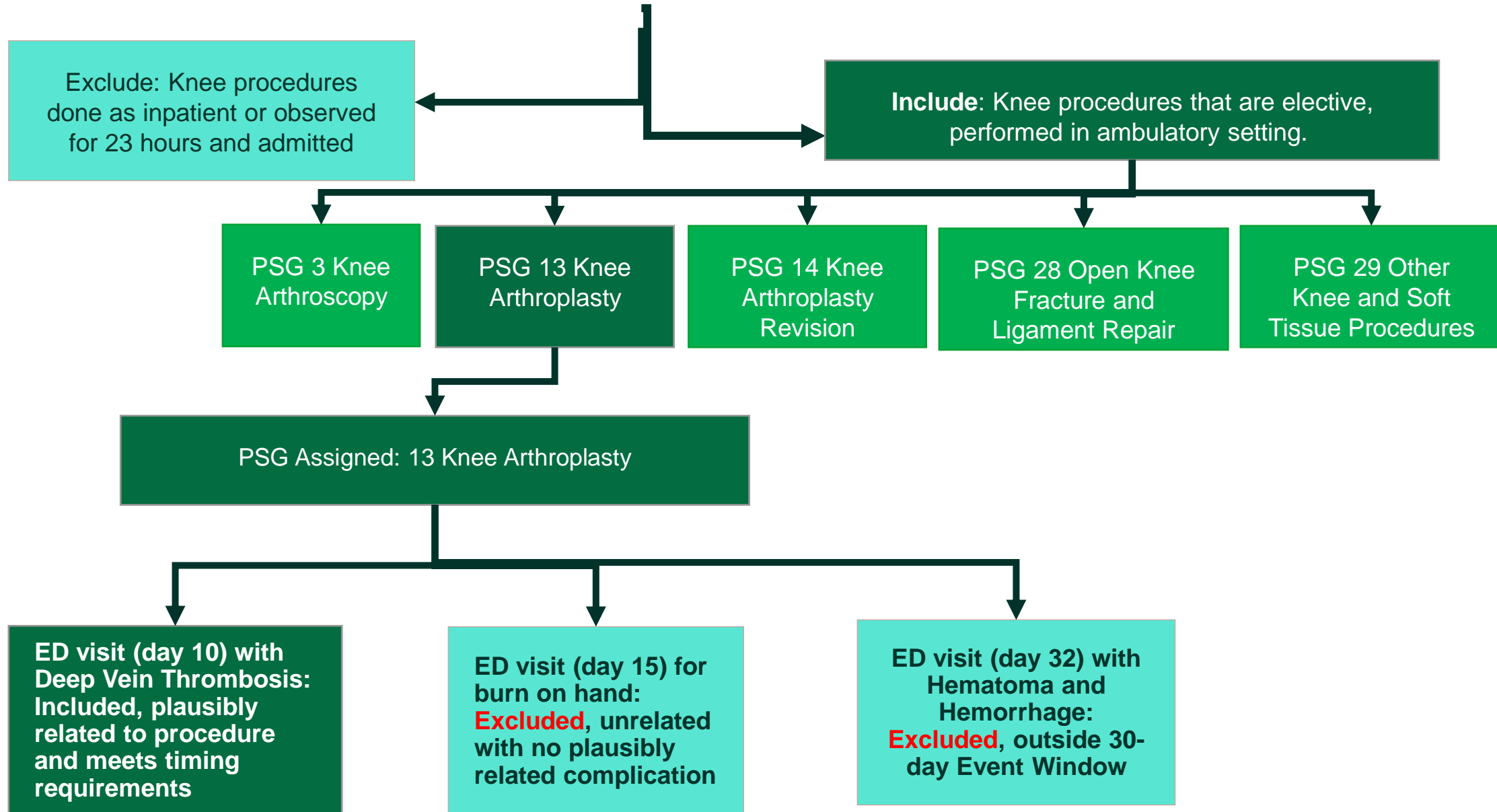
Medicare and national benchmarks (uses ED and inpatient only)



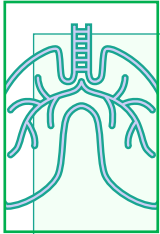
4 complication types

- Type 1 AM-PPC found in emergency department (ED)
- Type 2 AM-PPC found present on admission (POA) on inpatient admission
- Type 3 AM-PPC found in outpatient encounter
- Type 4 complication is an inpatient claim that contains an ambulatory procedure resulting in a complication and inpatient admission 72-hour rule

Example of AM-PPC Exclusion Logic

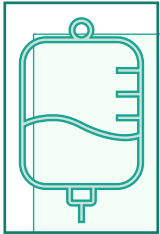


Samples of Complication Groups



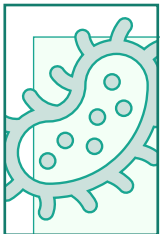
Lung Issues

- Pneumonia and Other Lung Infections
- Aspiration Pneumonia
- Pulmonary Embolism
- Other Pulmonary and Chest Complications



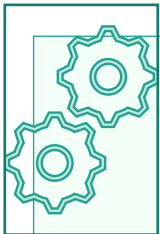
Bleeding Hematoma

- Post-Hemorrhagic and Other Acute Anemia
- Other Hemorrhage & Hematoma
- Venous Thrombosis



Infection Sepsis

- Septicemia and Severe Infections
- CLABSI, UTI
- Infection, Inflam. Compl. of Devices, Implants or Grafts
- (Specific ex. Cardiac. Vascular. GU, GI, Eye, Musculoskeletal)



Mechanical Complications

- Mechanical Compl. of Device, Implant and Graft
- (Specific ex. Cardiac. Vascular, GU, GI, Eye , Musculoskeletal)

3M AM-PPCs key metrics

Operational definitions

Absolute Performance

- **At risk procedures** – the number of procedures performed determined to be at risk
 - Procedures correspond to one of the 110 PSGs
 - Used to identify service lines, other areas with high procedure volumes
- **Actual complications** – the number of actual complications observed for the procedures determined to be at risk
 - Complications correspond to one of the 59 complication groups
 - Used to identify service lines, other areas with high absolute complication volumes
 - May be differentiated by where complication presents (IP, ED, OP)
- **Expected complications** – the number of complications expected for the procedures determined to be at risk, based on type of procedures, patient age, disability status, presence of oncology
 - Used to identify actual performance relative to a norm/benchmark

Relative Performance

- **Complication rate** – actual complications divided by at risk procedures
 - Used to identify service lines, other areas with high complication volumes relative to at risk procedures performed
- **Actual/expected** – actual complications divided by expected complications
 - Used to identify service lines, other areas with high complication volumes relative to expected complication volumes
 - >1, more complications than expected
 - <1, fewer complications than expected

Medicare Hospital Outpatient FFS 2019-2021

Top 15 Procedure Sub Groups

PSG	PSG_Description	At Risk Procedures	ED Complications	Inpatient Complications	Complication Rate	Outpatient Complications
70	Upper Gastrointestinal Endoscopy Procedures	2,309,197	12,498	32,383	1.94%	29,329
85	Lower Gastrointestinal Endoscopy Procedures	1,957,729	9,300	13,122	1.15%	16,158
99	Spine Injection Procedures	1,842,602	4,530	13,150	0.96%	9,133
91	Lower Genitourinary Procedures	832,157	19,607	16,517	4.34%	22,467
103	Routine Cataract Procedures	812,578	659	2,473	0.39%	3,434
84	Colonoscopy Screening Procedures	517,708	1,089	1,384	0.48%	2,464
52	Left Heart Catheterization Procedures	475,391	2,022	4,810	1.44%	2,785
13	Knee Arthroplasty	410,210	5,091	5,608	2.61%	3,058
74	Upper Airway Endoscopy Procedures	396,234	1,484	4,282	1.46%	5,565
55	Pacemaker/AICD Procedures	386,588	3,906	6,554	2.71%	4,458
23	Open Hand and Wrist Procedures	381,375	1,948	2,545	1.18%	2,827
61	Peripheral Vascular Access - Tunneled and PICC w Pump or Port	360,774	2,885	13,512	4.54%	6,348
39	Breast Biopsy and Localization Procedures	358,739	915	1,459	0.66%	1,519
56	Percutaneous Transluminal Coronary Angioplasty (PTCA)	336,585	2,175	5,049	2.15%	2,438
94	Upper Genitourinary Stent and Guidewire Procedures	315,841	10,279	14,292	7.78%	13,902
Total		11,693,708	78,388	137,140	1.84%	125,885

Procedure subgroup drilldown

By complication and complication type

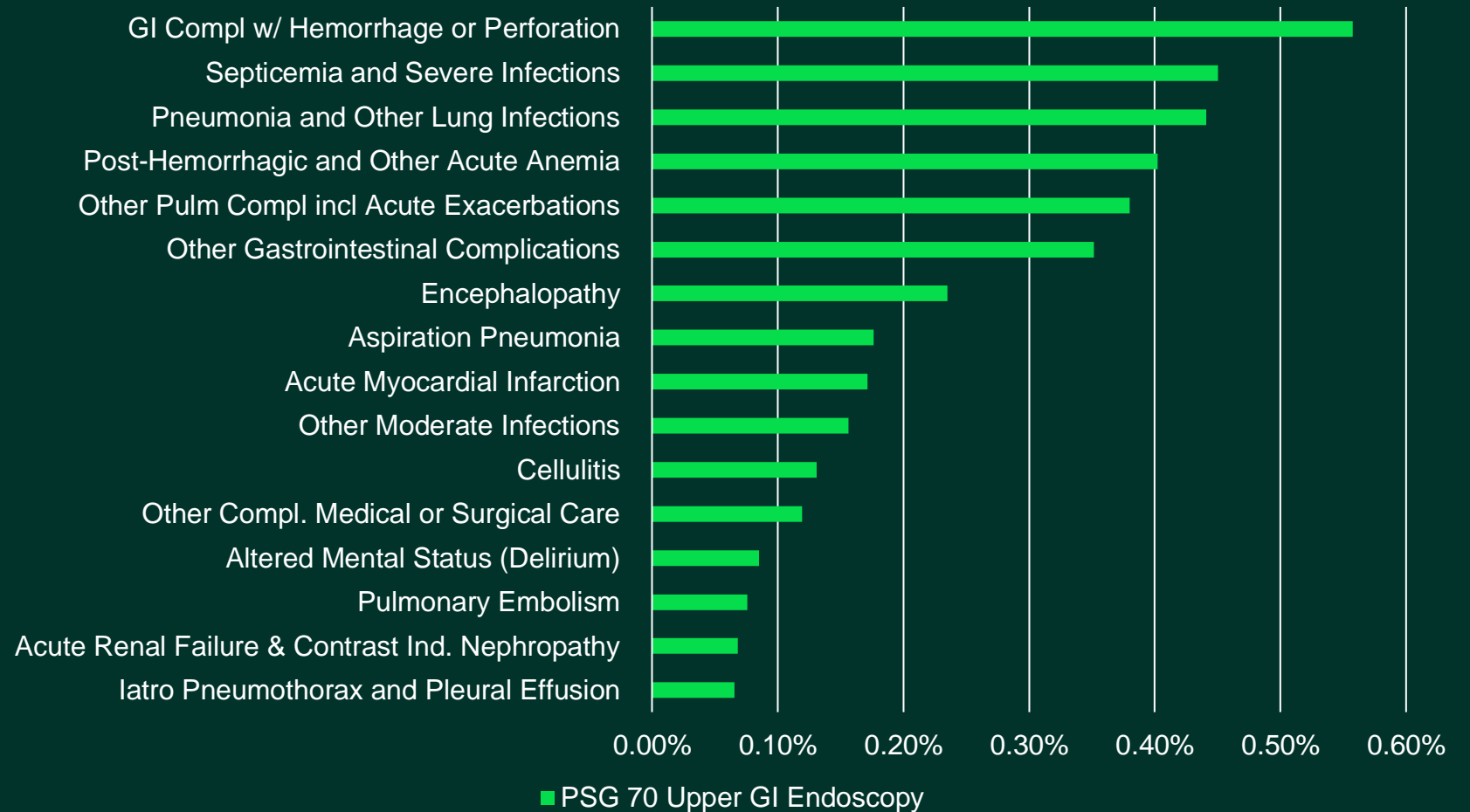
At risk procedures
2,309,197

ED complications
12,498

IP complications
32,383

Complication risk
1.94%

PSG 70 Upper GI Endoscopy



Sample procedure level data

View underlying details

AMPPC: Procedure and Complication Details

Patient ID	Procedure Date	Procedure Facility	Procedure Facility Type	Procedure Physician	Procedure Classification	PSG Description	Complication Date	Complication Facility	Complication Description
	Thursday, June 01, 2023	ASC Southport	ASC	Dr. Smith	At Risk Procedure with IP Complication	Knee Arthroplasty Procedures	Thursday, June 22, 2023	IP	Musculoskeletal Infection, Inflammation and Other Implant Complications
	Wednesday, November 01, 2023	ASC Southport	ASC	Dr. Smith	At Risk Procedure with IP Complication	Hip Arthroplasty Procedures	Wednesday, November 15, 2023	IP	Musculoskeletal Mechanical Device/Implant Complications
	Saturday, July 01, 2023	Hospital ABC	OP	Dr. McCarthy	At Risk Procedure with ED Complication	Extracorporeal Shock Wave Lithotripsy	Sunday, July 02, 2023	ED	Genitourinary Complications except Urinary Tract Infection
	Sunday, October 01, 2023	Hospital ABC	OP	Dr. McCarthy	At Risk Procedure with IP Complication	Upper Genitourinary Catheter (Percutaneous) Procedures	Tuesday, October 03, 2023	IP	Genitourinary Mechanical Device/Implant Complications
122458	Sunday, October 01, 2023	Hospital North	OP	Dr. Cloud	At Risk Procedure with ED Complication	Dialysis Shunt Procedures	Monday, October 02, 2023	ED	Vascular Infection, Inflammation and Other Implant Complications
123456	Friday, September 01, 2023	Hospital ABC	OP	Dr. James	At Risk Procedure with ED Complication	Upper Gastrointestinal Endoscopy Procedures	Saturday, September 09, 2023	ED	Gastrointestinal and Peritoneal Complications or Significant Bleeding

What procedures are in “70” Upper GI Endoscopy PSG

PSGs and HCPCS						
At Risk Procedures						
PSG Description	HCPCS At Risk Procedures	PSG At Risk Procedures	% of At Risk Procedures	HCPCS Complications	PSG Complications	% of PSG Complications
Upper Gastrointestinal Endoscopy Procedures	2,259,535	2,259,535	100.0%	45736	45736	100.00%
Esophagogastroduodenoscopy, flexible, transoral; with biopsy, single or	1,519,886	2,259,535	67.3%	23340	45736	51.03%
Esophagogastroduodenoscopy, flexible, transoral; diagnostic, including collection of specimen(s) by brushing or washing, when performed (separate procedure)	283,825	2,259,535	12.6%	6497	45736	14.21%
Esophagogastroduodenoscopy, flexible, transoral; with transendoscopic balloon dilation of esophagus (less than 30 mm diameter)	72,028	2,259,535	3.2%	1553	45736	3.40%
Esophagogastroduodenoscopy, flexible, transoral; with insertion of guide wire followed by passage of dilator(s) through esophagus over guide wire	49,861	2,259,535	2.2%	1006	45736	2.20%
Esophagogastroduodenoscopy, flexible, transoral; with endoscopic ultrasound examination limited to the esophagus, stomach or duodenum, and adjacent structures	42,970	2,259,535	1.9%	846	45736	1.85%
Esophagogastroduodenoscopy, flexible, transoral; with transendoscopic ultrasound-guided intramural or transmural fine needle aspiration/biopsy(s), (includes endoscopic ultrasound examination limited to the esophagus, stomach or duodenum, and adjacent structures)	32,343	2,259,535	1.4%	1115	45736	2.44%
Esophagogastroduodenoscopy, flexible, transoral; with directed submucosal injection(s), any substance	26,565	2,259,535	1.2%	763	45736	1.67%
Esophagogastroduodenoscopy, flexible, transoral; with directed placement of percutaneous gastrostomy tube	25,543	2,259,535	1.1%	2455	45736	5.37%
Esophagogastroduodenoscopy, flexible, transoral; with endoscopic ultrasound examination, including the esophagus, stomach, and either the duodenum or a surgically altered stomach where the jejunum is examined distal to the anastomosis	25,231	2,259,535	1.1%	425	45736	0.93%
Esophagogastroduodenoscopy, flexible, transoral; with transendoscopic ultrasound-guided intramural or transmural fine needle aspiration/biopsy(s) (includes endoscopic ultrasound examination of the esophagus, stomach, and either the duodenum or a surgically altered stomach where the jejunum is	23,861	2,259,535	1.1%	803	45736	1.76%
Total	2,259,535	2,259,535	100.0%	45736	45736	100.00%

What complications (AM-PPC) are in “70” Upper GI Endoscopy PSG

PSGs and HCPCS						
At Risk Procedures						
PSG/HCPCS/AMPPC	# Sum At Risk	ED Complications	IP Complications	In Scope Complications	Total HCPCS In Scope Complications	AMPPC % of Total HCPCS In Scope Complications
70	1,519,886	7,352	21,006	28,358	28,358	100.00%
Esophagogastroduodenoscopy, flexible, transoral; with biopsy, single or multiple	1,519,886	7,352	21,006	28,358	28,358	100.00%
Major Gastrointestinal Complications including Hemorrhages	1,519,886	2,285	3,963	6,248	28,358	22.03%
Pneumonia and Other Lung Infections	1,519,886	1,363	3,976	5,339	28,358	18.83%
Septicemia and Other Severe Infections	1,519,886	296	4,725	5,021	28,358	17.71%
Cellulitis	1,519,886	856	731	1,587	28,358	5.60%
Aspiration Pneumonia	1,519,886	109	1,407	1,516	28,358	5.35%
Acute Pulmonary Edema, Respiratory Failure or Distress	1,519,886	101	1,275	1,376	28,358	4.85%
Acute Myocardial Infarction	1,519,886	189	910	1,099	28,358	3.88%
Other Moderate	1,519,886	298	782	1,080	28,358	3.81%
Altered Mental Status (Delirium)	1,519,886	571	462	1,033	28,358	3.64%
Other Gastrointestinal Complications	1,519,886	141	520	661	28,358	2.33%
Other Complication of Medical or Surgical Care	1,519,886	459	145	604	28,358	2.13%
Shock	1,519,886	15	452	467	28,358	1.65%
Stroke and Intracranial Hemorrhage	1,519,886	60	336	396	28,358	1.40%
Total	1,519,886	7,352	21,006	28,358	28,358	100.00%



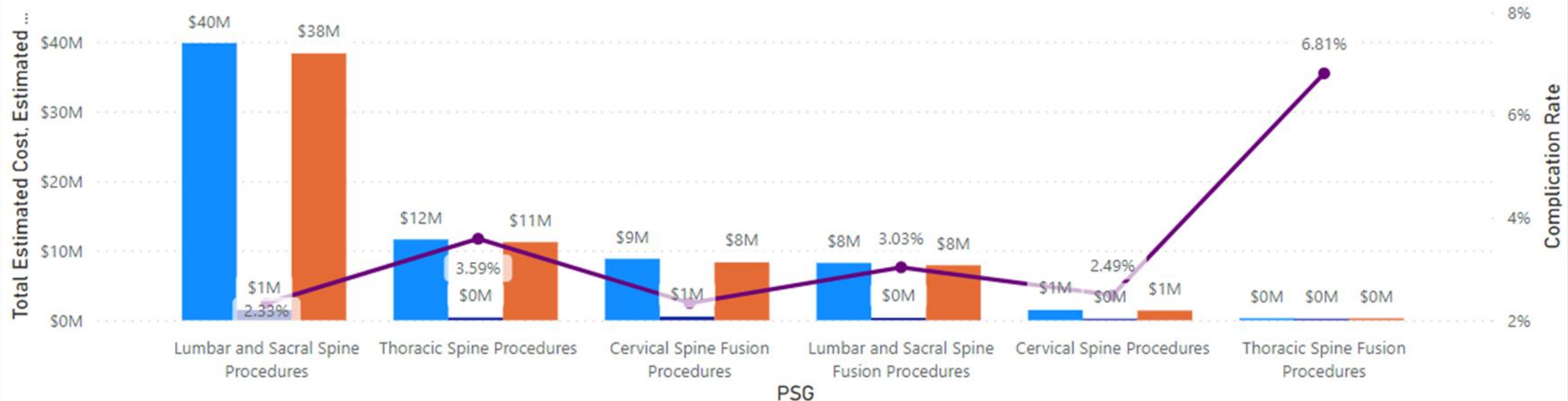
Details of Major GI Complications by DX Medicare HOPD 19-21 v1.1

AM-PPC's and Diagnoses					
AMPPC_DESC	DX ED Complications	DX IP Complications	DX Total Complications	AMPPC Total Complications	Dx % of AMPPC Total Complications
Genitourinary Mechanical Device/Implant Complications	15791	3107	18898	18898	100.00%
Infection, Inflammation and Clotting of PV Catheters	266	928	1194	1194	100.00%
Major Gastrointestinal Complications including Hemorrhages	11316	19899	31215	31215	100.00%
K922	3723	4154	7877	31215	25.23%
K625	4241	1615	5856	31215	18.76%
K91840	1403	3219	4622	31215	14.81%
K920	848	1420	2268	31215	7.27%
K254	121	1617	1738	31215	5.57%
K31811	67	1098	1165	31215	3.73%
K631	149	1014	1163	31215	3.73%
K264	41	911	952	31215	3.05%
K661	170	721	891	31215	2.85%
K5521	46	776	822	31215	2.63%
K2971	75	669	744	31215	2.38%
K55059	45	239	284	31215	0.91%
K55069	49	209	258	31215	0.83%
K91841	145	113	258	31215	0.83%
K2901	47	197	244	31215	0.78%
K250	16	192	208	31215	0.67%
K284	8	165	173	31215	0.55%
K55039	10	145	155	31215	0.50%
K274	22	116	138	31215	0.44%
K265	2	128	130	31215	0.42%
K2951	21	109	130	31215	0.42%
K55019	9	102	111	31215	0.36%
K255	5	104	109	31215	0.35%
K2961	7	97	104	31215	0.33%

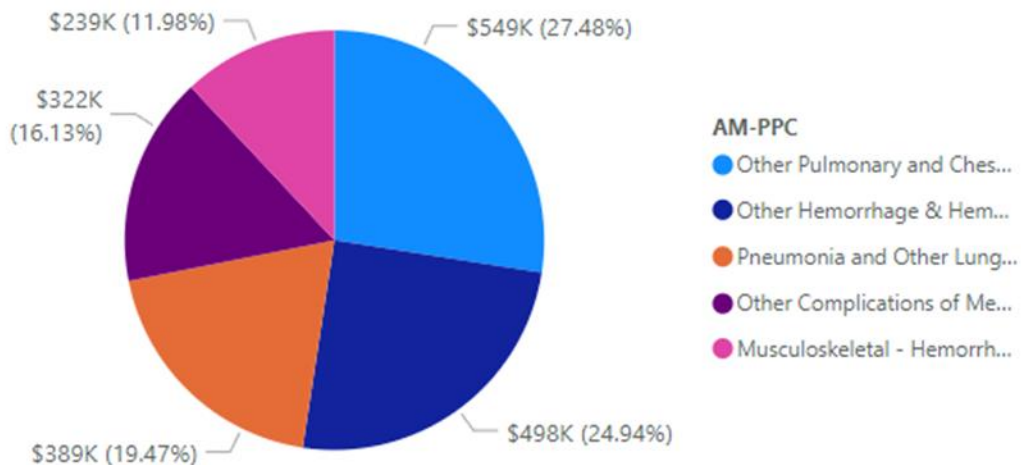
At Risk Procedures and Complications: PSG



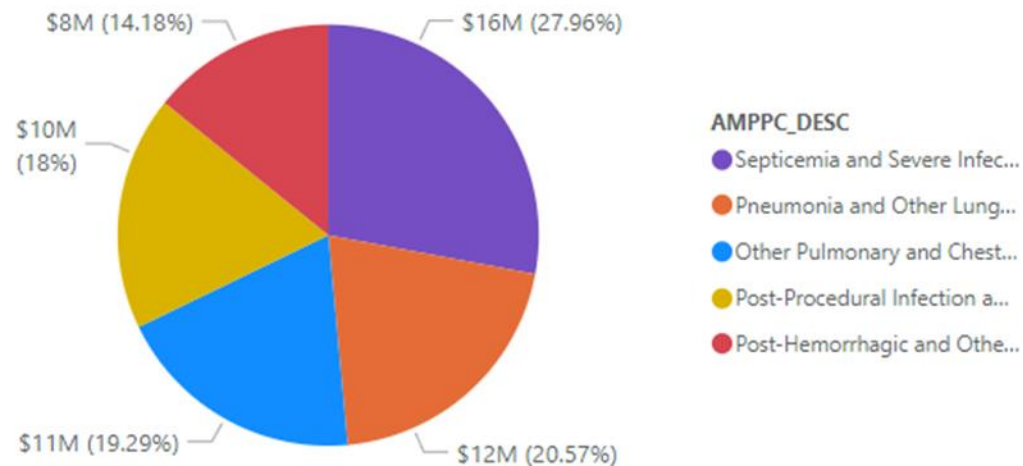
● Total Estimated Cost ● Estimated ED Cost ● Estimated IP Cost ● Complication Rate



ED Complications



IP Complications



AM-PPC: Hospital Score Card*

At Risk Procedures

13K

Actual Complications

410

Expected Complications

390

Actual / Expected

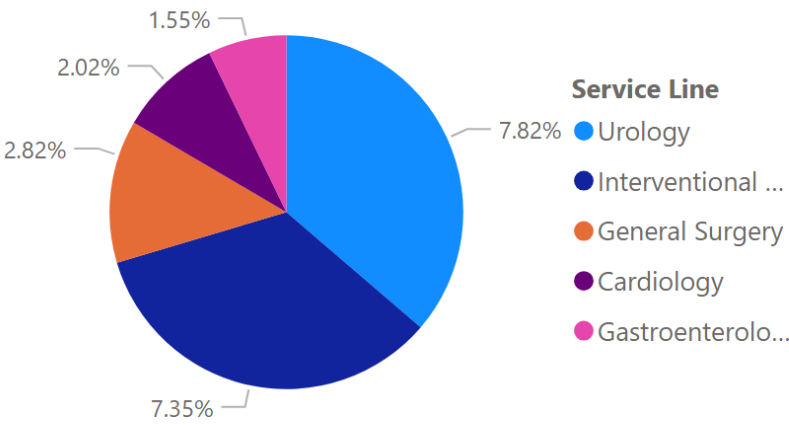
1.05

Actual / Expected Quintile**

Average

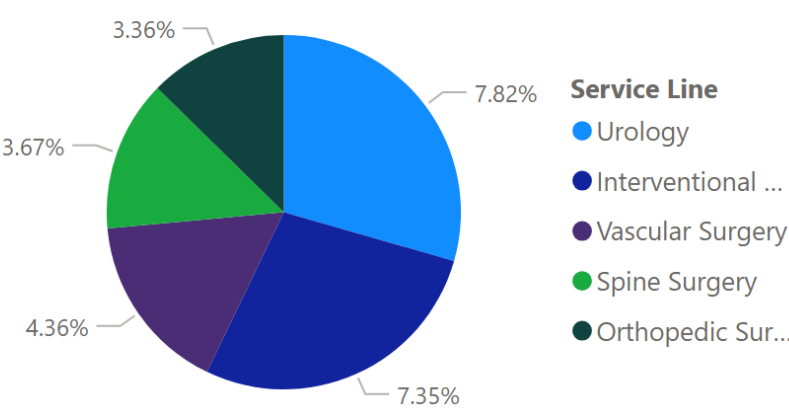
Top 5 Service Lines by At Risk Procedure Volume

Complication Rates



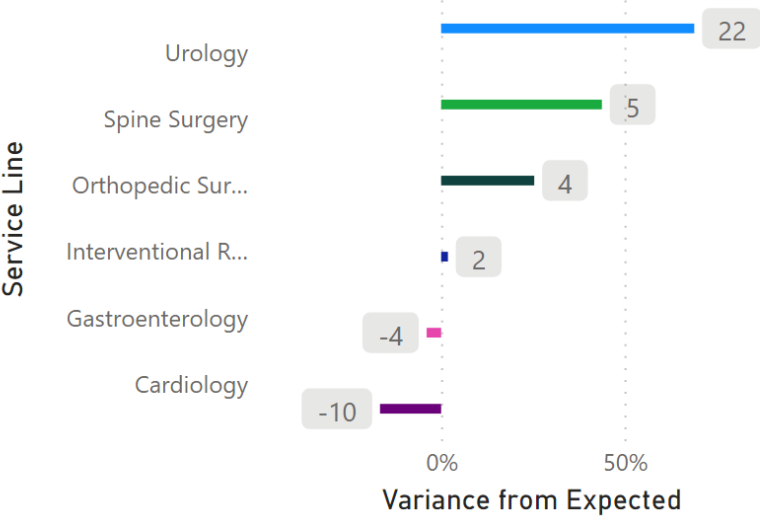
Top 5 Service Lines by Complication Rate

Complication Rates



Variance from Expected by Service Line

Actual Complication Minus Expected Complications



* Results derived 2019-2021 Medicare Hospital Outpatient Department Claims
 ** Performance Percentile calculated across all facilities submitting Medicare Hospital Outpatient Department Claims
 Only Evaluating Service Lines with > 10 Actual Complications

Thank you