

## Supplementary Online Content

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**eTable 1.** *ICD-9* and *ICD-10* Diagnosis Codes Used for Inclusion in Study

**eTable 2.** *ICD-9* and *ICD-10* Diagnosis and Procedure Codes for Early Uncomplicated Presentation, Optimal Surgical Care and Minimally Invasive Surgery

**eTable 3.** Total Cost Sharing by Patient Characteristics Among 151 852 Patients (2013-2017)

This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1. ICD-9 and ICD-10 Diagnosis Codes Used for Inclusion in Study**

<b>Diagnosis</b>	<b>ICD-9 Diagnosis Codes</b>	<b>ICD-10 Diagnosis Codes</b>
Acute Appendicitis	540.0, 540.1, 540.9, 541, 542	K35.2, K35.20, K35.21, K35.3, K35.30, K35.31, K35.32, K35.33, K35.8, K35.80, K35.891, K36, K37
Acute Diverticulitis	562.10, 562.11, 562.12, 562.13	K57.2, K57.20, K57.21, K57.3, K57.30, K57.31, K57.32, K57.33

Abbreviations: ICD-9 International Classification of Diseases, 9<sup>th</sup> Edition. ICD-10 International Classification of Diseases, 10<sup>th</sup> Edition

**eTable 2. ICD-9 and ICD-10 Diagnosis and Procedure Codes for Early Uncomplicated Presentation, Optimal Surgical Care and Minimally Invasive Surgery**

Early Uncomplicated Presentation	Optimal Surgical Care	Minimally Invasive Surgery*
Absence of Diagnosis Codes	<sup>1</sup> Presence of Procedure Codes <sup>2</sup> Absence of Procedure Codes	<sup>a</sup> Open vs <sup>b</sup> Laparoscopic Surgical Procedure Codes
<b><sup>1</sup>Acute Appendicitis</b>		
540.0, 540.1, 567.22, 567.29, 567.31, 567.38, 569.5, 785.50, 785.52, 995.91, 995.92  K35.2, K35.20, K35.21, K35.32, K35.33, K63.2, K63.20, K65.0, K65.1, K68.12, K68.19, R65.2, R65.20, R65.21, A41.4, A41.50, A41.51, A41.52, A41.53, A41.59, A41.81, A41.89 A41.9, R57.9, R65.20, R65.21	47.09, 47.01  0DTJ0ZZ, 0DTJ4ZZ	<b>a:</b> 47.09, 0DTJ0ZZ  <b>b:</b> 47.01, 0DTJ4ZZ
<b><sup>2</sup>Acute Diverticulitis</b>		
567.31, 567.22, 567.29, 567.38, 567.39, 569.5, 569.81, 569.83, 785.50, 785.52, 995.91, 995.92  K57.20, K57.21, K63.2, K65.1, K68.12, K68.19, N32.1, N32.2, N82.3, N82.4	46.01, 46.03, 46.10, 46.11, 46.13, 46.14, 46.20, 46.21, 46.22, 46.23, 46.24  0DSB0ZZ, 0DSB4ZZ, 0DSB7ZZ, 0DSB8ZZ, 0DSBXZZ, 0D1B0Z4, 0D1B4Z4, 0D1B8Z4 0DSH0ZZ, 0DSK0ZZ, 0DSL0ZZ, 0DSM0ZZ, 0DSN0ZZ, 0DSP0ZZ, 0DSQ0ZZ, 0DSH4ZZ, 0DSK4ZZ, 0DSL4ZZ, 0DSM4ZZ, 0DSN4ZZ, 0DSP4ZZ, 0DSQ4ZZ, 0DSH7ZZ, 0DSK7ZZ, 0DSL7ZZ, 0DSM7ZZ, 0DSN7ZZ, 0DSP7ZZ, 0DSQ7ZZ, 0DSH8ZZ, 0DSK8ZZ, 0DSL8ZZ, 0DSM8ZZ, 0DSN8ZZ, 0DSP8ZZ, 0DSQ8ZZ, 0DSHXZZ, 0DSKXZZ, 0DSLXZZ, 0DSMXZZ, 0DSNXZZ, 0DSPXZZ, 0DSQXZZ, 0D1H0Z4, 0D1K0Z4, 0D1L0Z4, 0D1M0Z4, 0D1N0Z4, 0D1H4Z4, 0D1K4Z4, 0D1L4Z4, 0D1M4Z4, 0D1N4Z4, 0D1H8Z4, 0D1K8Z4, 0D1L8Z4, 0D1M8Z4, 0D1N8Z4	<b>a:</b> 45.75, 45.76, 45.79, 0DTM0ZZ, 0DTN0ZZ, 0DBM0ZZ, 0DBN0ZZ  <b>b:</b> 17.35, 17.36, 17.39, 0DTM4ZZ, 0DTN4ZZ, 0DBM4ZZ, 0DBN4ZZ

Abbreviations: ICD-9 International Classification of Diseases, 9<sup>th</sup> Edition. ICD-10 International Classification of Diseases, 10<sup>th</sup> Edition

\*Among those with an appendectomy or colectomy

**eTable 3.** Total Cost Sharing by Patient Characteristics Among 151 852 Patients (2013-2017)

Characteristic <sup>1</sup>	Total N = 151,852 N (Col %)	Total Cost Sharing Quartiles			
		Q1 (\$0 - \$502) N = 37,957	Q2 (\$502 - \$1,725) N = 37,981	Q3 (\$1,726 - \$3,082) N = 37,954	Q4 (> \$3,082) N = 37,960
		N (Row %)			
<b>Diagnosis</b>					
Acute Appendicitis	65,424 (43.1)	14,240 (21.8)	14,929 (22.8)	17,040 (26.0)	19,215 (29.4)
Acute Diverticulitis	86,428 (56.9)	23,717 (27.4)	23,052 (26.7)	20,914 (24.2)	18,745 (21.7)
<b>Age Group (years)</b>					
18 – 24	11,281 (7.4)	2,757 (24.4)	2,601 (23.1)	2,850 (25.3)	3,073 (27.2)
25 – 34	18,459 (2.2)	3,778 (20.5)	4,228 (22.9)	5,019 (27.2)	5,343 (29.4)
35 – 44	27,637 (18.2)	6,054 (21.9)	6,938 (25.1)	7,227 (26.1)	7,418 (26.8)
45 – 54	43,770 (28.8)	10,873 (24.8)	11,079 (25.3)	11,059 (25.3)	10,759 (24.6)
55 - 64	50,705 (33.4)	14,495 (28.6)	13,135 (25.9)	11,799 (23.3)	11,276 (22.2)
<b>Gender</b>					
Male	79,517 (52.4)	18,643 (23.4)	19,288 (24.3)	20,330 (25.6)	21,256 (26.7)
Female	72,335 (47.6)	19,314 (26.7)	18,693 (25.8)	17,624 (24.4)	16,704 (23.1)
<b>Calendar Year</b>					
2013	35,407 (23.3)	8,905 (25.1)	9,899 (28.0)	9,185 (25.9)	7,418 (20.9)
2014	30,414 (20.0)	7,344 (24.1)	8,120 (26.7)	7,891 (25.9)	7,059 (23.2)
2015	28,542 (18.8)	6,980 (24.5)	7,126 (25.0)	7,201 (25.2)	7,235 (25.3)
2016	30,204 (19.9)	7,769 (25.7)	7,081 (23.4)	7,013 (23.2)	8,341 (27.6)
2017	27,285 (18.0)	6,959 (25.5)	5,755 (21.1)	6,664 (24.4)	7,907 (29.0)
<b>Calendar Quarter</b>					
Jan-Mar	36,585 (24.1)	6,802 (18.6)	8,752 (23.9)	10,288 (28.1)	10,743 (29.4)
Apr-Jun	39,471 (26.0)	9,336 (23.6)	10,077 (25.5)	9,978 (25.3)	10,080 (25.5)
Jul-Sep	39,056 (25.7)	10,338 (26.5)	10,026 (25.7)	9,525 (24.4)	9,167 (23.5)
Oct-Dec	36,740 (24.2)	11,481 (31.2)	9,126 (24.8)	8,163 (22.2)	7,970 (21.7)
<b>Elixhauser Comorbidity Index<sup>2</sup></b>					
0	22,549 (41.3)	5,018 (22.2)	4,914 (21.8)	5,589 (24.8)	7,028 (31.2)
1	15,311 (28.1)	3,931 (25.7)	3,556 (23.2)	3,681 (24.0)	4,143 (27.1)
2	9,230 (16.9)	2,656 (28.8)	2,185 (23.7)	2,127 (23.0)	2,262 (24.5)
3+	7,498 (13.7)	2,818 (37.6)	1,635 (21.8)	1,494 (19.9)	1,551 (20.7)
<b>Social Deprivation Index Quartiles</b>					

Q1 (1 - 25)	49,536 (33.7)	12,515 (25.3)	12,914 (26.1)	12,340 (24.9)	11,767 (23.7)
Q2 (26 - 50)	38,850 (26.5)	9,504 (24.5)	9,840 (25.3)	9,726 (25.0)	9,780 (25.2)
Q3 (51 - 75)	32,226 (22.0)	7,482 (23.2)	7,944 (24.6)	8,359 (25.9)	8,441 (26.2)
Q4 (76 - 100)	26,181 (17.8)	6,350 (24.2)	6,263 (23.9)	6,542 (25.0)	7,026 (26.8)
<b>Rural</b>					
Urban	134,341 (91.5)	32,901 (24.5)	33,727 (25.1)	33,780 (25.1)	33,933 (25.3)
Rural	12,458 (8.5)	2,956 (23.7)	3,236 (26.0)	3,185 (25.6)	3,081 (24.7)
<b>Census Bureau Geographic Divisions</b>					
New England	5,489 (3.7)	1,654 (30.1)	1,473 (26.8)	1,313 (23.9)	1,049 (19.1)
Middle Atlantic	21,886 (14.9)	7,966 (36.4)	5,683 (26.0)	4,533 (20.7)	3,704 (16.9)
East North Central	20,556 (14.0)	5,217 (25.4)	5,328 (25.9)	5,041 (24.5)	4,970 (24.2)
West North Central	9,264 (6.3)	2,344 (25.3)	2,277 (24.6)	2,391 (25.8)	2,252 (24.3)
South Atlantic	34,614 (23.6)	8,047 (23.3)	8,816 (25.5)	8,421 (24.3)	9,330 (26.9)
East South Central	7,069 (4.8)	1,470 (20.8)	1,946 (27.5)	1,870 (26.4)	1,783 (25.2)
West South Central	26,302 (17.9)	4,397 (16.7)	6,242 (23.7)	7,754 (29.5)	7,909 (30.1)
Mountain	9,546 (6.5)	1,967 (20.6)	2,144 (22.5)	2,429 (25.4)	3,006 (31.5)
Pacific	12,065 (8.2)	2,788 (23.1)	3,052 (25.3)	3,214 (26.6)	3,011 (25.0)
<b>High Deductible Plan</b>					
No	113,186 (74.9)	30,782 (27.2)	30,569 (27.0)	28,157 (24.9)	23,678 (20.9)
Yes	37,959 (25.1)	6,938 (18.3)	7,302 (19.2)	9,594 (26.3)	14,125 (37.2)
<b>Benefit Plan Type</b>					
Point of Service	104,737 (69.0)	22,808 (21.8)	27,256 (26.0)	29,218 (27.9)	25,455 (24.3)
Preferred Provider Organization	17,804 (11.7)	4,724 (26.5)	4,112 (23.1)	3,627 (20.4)	5,341 (30.0)
Health Maintenance Organization	19,200 (12.6)	6,820 (35.5)	4,255 (22.2)	3,227 (16.8)	4,898 (25.5)
Exclusive Provider Organization	8,926 (5.9)	3,022 (33.9)	2,154 (24.1)	1,735 (19.4)	2,015 (22.6)
Other <sup>3</sup>	1,185 (0.8)	583 (49.2)	204 (17.2)	147 (12.4)	251 (21.2)

<sup>1</sup>Missing (N): SDI (5,059); Rurality (5,053); Census Bureau Geographic Divisions (5,061); High Deductible Plan (707)

<sup>2</sup>Study cohort (36.0%) for ECI (N = 54,588); Study time period: 10/2015-2017

<sup>3</sup>Other includes Indemnity, Short Term and Other