Patient-Centered Oncology Payment Model (PCOP): Quantitative Analysis for the PRT
April 2, 2020 (updated)

EXECUTIVE SUMMARY

The American Society of Clinical Oncology (ASCO) Patient-Centered Oncology Payment Model (PCOP) proposes monthly care management payments (CMPs) and performance incentive payments (PIPs) to hematological or medical oncologists to ensure that all patients in the PCOP model receive high-quality, well-coordinated care. Calendar Year (CY) 2017 Medicare fee-for-service (FFS) claims were analyzed and tabulated to support PTAC's review of the PCOP proposal.

In CY2017, 2.3 million Medicare FFS beneficiaries were diagnosed with some form of cancer and seen by a hematological or medical oncologist. Most of these beneficiaries were treated by a single oncology practice, although some saw practitioners in two practices. Three-quarters of the practices with hematological or medical oncologists who saw these patients comprised fewer than six such practitioners; the practices averaged about 160 FFS beneficiaries per hematological or medical oncologist.

To offset the cost of CMPs and PIPs, the PCOP proposal relies on savings from total cost of care (TCOC), especially in three areas that also constitute one of the metrics used to determine PIPs:

- **Emergency department (ED) visits.** The 2.3 million FFS beneficiaries studied in CY2017 averaged 0.06 ED visits per month, resulting in monthly Medicare payments of $47 on average.
- **Unplanned inpatient admissions.** These same beneficiaries averaged 0.08 unplanned admissions per month in CY2017, resulting in an average monthly Medicare payment (excluding pass-through amounts) of $858.
- **Spending on supportive/maintenance drugs.** Beneficiaries studied averaged $91 per month in Part B supportive drug expenses and $66 per month in Part D drug expenses in CY2017.

The PCOP CMPs would vary with the type of care provided to the beneficiary in a given month.[1] The following are CY2017 mean and median monthly oncologist treatment and management payments for these different types of care provided to beneficiaries.

- **New patient months** are those when a patient is first seen by the hematological/medical oncologist. There were half a million such months in CY2017, with mean and median monthly oncologist treatment and management payments of $912 and $177, respectively.
- **Cancer treatment months** are those during which the patient is undergoing chemotherapy. There were 8 million such patient-months in CY2017, with mean and median monthly oncologist treatment and management payments of $1,325 and $85.
- **Active monitoring months** follow the conclusion of chemotherapy while the patient is under the medical supervision of a hematological/medical oncologist. There were 1.5 million patient months of this type of care in CY2017, with mean and median oncologist treatment and management payments of $370 and $62.

[1] The submitter used data from the state of Maine to model estimated monthly CMP amounts for Medicare beneficiaries as follows: New Patients ($450 for Track 1 and $675 for Track 2); Cancer Treatment ($225 for Track 1 and $338 for Track 2); and Active Monitoring ($75 for Track 1 and $113 for Track 2).

QUANTITATIVE ANALYSIS HIGHLIGHTS

Overview

This analysis provides information on the following topics to give perspective for assessing the PCOP proposal:

- Cancer prevalence and incidence in the Medicare FFS population
- TCOC for cancer patients
- Use of oncology practices by cancer patients
- Use of selected services (ED visits, unplanned hospital admissions, and maintenance drug expenditures) by cancer patients
- Geographic concentration of cancer patients

Exhibits in the document come from a detailed analysis conducted by the contractor. Supporting information on the analysis is also available. Appendix 1, "Diagnoses Used to Identify Study Population," appears at the end of this document. Appendices 2 and 3, "Healthcare Common Procedure Coding System (HCPCS) codes and National Drug Codes (NDCs) Associated with Cancer Treatment Drugs Administered or Taken" and "HCPCS codes and NDCs Associated with Supportive and Maintenance Care Drugs" respectively, are posted separately with this analysis.

Study population

The study used a 20 percent sample of FFS beneficiaries enrolled in Medicare Parts A and B for all eligible months in CY2017 who:

- Were not enrolled in a Medicare Advantage plan
- Were not diagnosed with end-stage renal disease (ESRD)
- Had a 2017 claim with a cancer diagnosis in one of four diagnosis groupings or "cohorts" (the diagnosis code could appear in any position on the claim; cohorts are defined in Appendix 1)

These exclusions resulted in an estimated population of 6.1 million Medicare beneficiaries in CY2017. To focus on the size of the population potentially affected by the PCOP intervention, we further limited the sample to beneficiaries who saw a hematological or medical oncologist during CY2016 or CY2017. The resulting 465,675 sample beneficiaries represented 2.3 million beneficiaries in CY2017.

Exhibit 1: Cancer prevalence and incidence in the study population

Among the 2.3 million beneficiaries in the study population, most beneficiaries were diagnosed in only one of the cancer cohorts, though some were diagnosed in more than one cohort. Among prevalent cancer cases, 38.2 percent were incident cases (i.e., claims in 2017 but not in 2016). Incidence varied across the cohorts from 24.5 percent (Cohort C) to 42.0 percent (Cohort D).

Exhibit 2: Total cost of care for cancer patients in the study population

The Medicare TCOC for these beneficiaries in 2017 was $68.4 billion for the prevalent population and $33.5 billion for the incident subpopulation. These amounts represent Medicare payments for Part A services and Part B services (in both cases measured as "standardized costs," i.e., excluding geographic and other adjustments) and payments under Part D (comprising covered plan payment amounts and any low-income subsidy amounts). Cohort D had the highest TCOC for both prevalent and incident cases.

Exhibits 3-5: Use of oncology practices by the study population

The majority (>77 percent) of cancer patients seen by a hematological/medical oncologist received their care from a single oncology practice, regardless of cancer cohort (Exhibit 3). An oncology practice is defined as a practice that submitted at least one hematological/medical oncologist claim during CY2017. Almost all remaining beneficiaries received services from two such practices.

Of the roughly 2,900 oncology practices identified in Medicare claims in CY2017, 45 percent had a single hematological/medical oncologist and 35 percent had two to five such practitioners (Exhibit 4). Only 10 percent had 11 or more hematological/medical oncologists. The number of study population patients per hematological/medical oncologist was somewhat lower for single-oncologist practices and for very large practices than for mid-sized practices.

The average hematological/medical oncology practice in CY2017 saw 790 beneficiaries in the study population (Exhibit 5). Slightly less than half of the practices saw 200 or fewer beneficiaries; 14 percent of practices saw more than 1,500 beneficiaries.

Exhibits 6-9: Use of selected services by the study population

Savings in the PCOP model that offset CMPs depend especially on reductions in ED use, unplanned inpatient admissions, and spending for maintenance drugs. Exhibits 6 through 8 show use of these services by the study population in CY2017.

About 30 percent of the study population had one or more outpatient ED visits during CY2017 (Exhibit 6). These excluded most ED visits that resulted in an inpatient admission, because the latter are paid for through the inpatient prospective payment system to the admitting hospital. The average monthly number of outpatient visits was 0.06 across the entire study population; among those who used ED services, the mean number of monthly visits was 0.2. As shown by the interquartile range, a quarter of these users had 0.08 ED visits or fewer per month, and a quarter of them had 0.25 visits or more.

Less than a third of the study population had one or more unplanned inpatient admissions during CY2017 (Exhibit 7).[2] Among those with unplanned admissions, the average monthly number of such visits was 0.3. A quarter of the study group who had unplanned admissions had 0.1 or fewer per month, and another quarter had 0.3 or more.

Supportive and maintenance drugs used during the monitoring phase of PCOP care are paid by Medicare through Part B, Part D, or both. Among the 15 percent of the study population who used Part B supportive/maintenance drugs in CY2017 (Exhibit 8), the mean monthly expenditure was $595. For a quarter of these beneficiaries, the monthly Medicare payment was $59 or less; for another quarter the monthly payment was $672 or more.

Approximately 28 percent of beneficiaries with Part D used supportive/maintenance drugs in CY2017 (Exhibit 9). The average amount paid per month for Part D enrollees with some supportive/maintenance drugs was $240. Mean monthly Medicare payments for Part D supportive/maintenance drugs were relatively varied across the cohorts, likely due to the underlying costs of the drugs in the list. For

[2] An unplanned admission is one that does not meet any of the following criteria: a procedure is performed that is in one of the procedure categories that are always planned regardless of diagnosis; or the principal diagnosis is in one of the diagnosis categories that are always planned; or a procedure is performed that is one of the defined potentially planned procedures and the principal diagnosis is not in the list of defined acute discharge diagnoses. A few specific, limited types of care are always considered planned: transplant surgery, maintenance chemotherapy/immunotherapy, and rehabilitation. Admissions for acute illness or for complications of care are never planned. This definition follows the CMS hospital-wide readmission measure specifications; see https://www.qualitynet.org/inpatient/measures/readmission/methodology.

example, payments for plerixaflor could run $7,000 per day or more, while those for alendronate or anastrozole could run 20 cents per day or less. Reflecting a very skewed distribution of these drug costs, the median monthly Medicare payment was $4, with an interquartile range from $2 to $14.

Exhibit 10: Geographic concentration of the study population

The ASCO model is local, calling "for the creation of 'PCOP Communities' consisting of all payers, providers, employers and other stakeholders within a geographic region. These communities shall guide implementation of the PCOP methodologies to address their unique healthcare needs."[3] In many Medicare models, communities are defined in terms of core-based statistical areas (CBSAs). Exhibit 10 shows the distribution of CBSAs by the number of study population enrollees treated by hematological/medical oncologists in the CBSA. Beneficiaries treated in more than one CBSA are counted in each area; Puerto Rico is excluded as there is no CBSA in that commonwealth. Almost half of all CBSAs—322 of them—have hematological/medical oncologists who treated more than 1,000 members of the study population in 2017. These CBSAs tend to be concentrated on the coasts, especially the East Coast.

Exhibits 11-13: Medicare monthly payments by treatment phase (initial, chemotherapy, and maintenance) for the study population

The PCOP model establishes care management payments for three types of months: new-patient months, cancer-treatment months, and monitoring months:

- The first type occurs when a patient presents to the hematological/medical oncologist.
- The second type occurs while the patient is receiving chemotherapy.
- The third type occurs after chemotherapy while the patient is being actively managed by the oncology practice.

Exhibits 11, 12, and 13 show average standardized Medicare payments for TCOC and those made to hematological/medical oncologists for each type of month in CY2017 for beneficiaries in the study population who received care in each category. As one would expect, the first month of treatment is fairly expensive, as are the months that include chemotherapy treatments. Medicare payments for active monitoring months are less than half the Medicare payments made during new and cancer treatment months. These patterns hold both for TCOC and for payments for hematological/medical oncologist services.

[3] ASCO proposal, page 1.

Contents

The following additional Appendices can also be found separately on the Assistant Secretary for Planning and Evaluation (ASPE) PTAC website:

- Appendix 2: HCPCS codes and NDCs associated with Cancer Treatment Drugs Administered or Taken
- Appendix 3: HCPCS codes and NDCs Associated with Supportive and Maintenance Care Drugs

Note:

- All exhibits are for the study population, composed of Medicare FFS Parts A and B beneficiaries without ESRD, seen by a hematological or medical oncologist during CY2017.

Exhibit 1. Number of Medicare Fee-for-Service Beneficiaries (Study Population) Seen by a Hematological or Medical Oncologist, by Selected Cancer Types, 2017

	All beneficiaries	Beneficiaries with cancer incident in CY2017	Incidence Rate
Any cancer	2,328,000	890,000	38.2%
Cohort A	477,000	161,000	33.8%
Cohort B	708,000	225,000	31.8%
Cohort C	848,000	208,000	24.5%
Cohort D	1,327,000	558,000	42.0%

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with Eend-stage renal disease.
To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below.
Cohorts A through D are defined in Appendix G of the ASCO proposal:
Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma
Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/chemotherapy)
Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary
Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers
Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.

Exhibit 2. Total Medicare Fee-for-Service Payments for Beneficiaries (Study Population) Seen by a Hematological or Medical Oncologist, by Selected Cancer Types, 2017 (in millions, standardized dollars)

	All beneficiaries	Beneficiaries with cancer incident in CY2017
Any cancer	$68,384m	$33,542m
Cohort A	$18,769m	$7,673m
Cohort B	$25,944m	$9,860m
Cohort C	$20,399m	$7,531m
Cohort D	$48,796m	$21,728m

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.
To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below.
Cohorts A through D are defined in Appendix G of the ASCO proposal:
Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma
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Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary
Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers
Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.
"Standardized" dollars remove the adjustment for geographic locality and other factors. Part D payments comprise covered plan benefits and low-income-subsidy payments.

Exhibit 3. Medicare Fee-for-Service Beneficiaries (Study Population) Seen by a Hematological or Medical Oncologist, by Selected Cancer Types and Number of Hematology/Medical Oncology Practices Visited, 2017

Number of Practices Visited	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
Total	2,328,000	477,000	708,000	848,000	1,327,000
None*	2.6%	2.1%	2.2%	2.5%	2.2%
1	82.4%	77.6%	80.4%	84.0%	79.7%
2	12.9%	16.9%	14.7%	11.7%	15.1%
3	1.8%	2.7%	2.3%	1.5%	2.4%
4 or more	0.3%	0.6%	0.5%	0.3%	0.5%

NOTES:

Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.

* To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below. These beneficiaries were seen in 2016 but not in 2017.

Cohorts A through D are defined in Appendix G of the ASCO proposal:

Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma

Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)

Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary

Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers

Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.

Practices are defined by Tax Identification Number (TIN) for those operating in the community and by CMS Certification Number (CCN) for those operating in hospital outpatient settings. The facility claims were restricted to Federally Qualified Health Centers (FQHCs), Rural Health Centers (RHCs), or Method-II Critical Access Hospitals (CAHs). Hospital-based and hospital-owned practices are included with those filing on carrier claims, as ownership cannot be determined without a detailed exploration of the TIN and counting all facility claims would result in double-counting an outpatient visit—once through the facility claim and once through the professional claim.

A hematology/medical oncology practice is defined as a practice with at least one hematology/oncology or medical oncologist specialist treating eligible Medicare patients. Oncologists are defined by individual National Provider Identifier (NPI) and specialty codes for Hematology/Oncology (83) and Medical Oncology (90).

Exhibit 4. Distribution of Hematological/Medical Oncology Practices by Number of Oncologists Seeing Medicare Fee-for-Service Beneficiaries (Study Population), 2017

Number of oncologists	Number and percent of practices	Average number of oncologists	Average number of beneficiaries	Average beneficiaries per oncologist
Total	2,857 (100%)	5	790	158
1	1,275 (45%)	1	115	115
2–5	1,001 (35%)	3	495	165
6–10	299 (10%)	7	1,380	197
11–20	159 (6%)	14	2,610	186
21 or more	123 (4%)	47	6,420	137

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.
Practices are defined by Tax Identification Number (TIN) for those operating in the community, and by CMS Certification Number (CCN) for those operating in Federally Qualified Health Centers, Rural Health Centers, and Critical Access Hospitals billing on the facility claim.
To be included in this exhibit, a practice must have had at least one hematological/medical oncologist having seen at least one Medicare enrollee described above.
Oncologists are defined by individual National Provider Identifier (NPI) and specialty codes for Hematology/Oncology (83) and Medical Oncology (90).

Exhibit 5. Distribution of Hematological/Medical Oncology Practices by Number of Medicare Fee-for-Service Beneficiaries (Study Population) Ever Seen, 2017

Number of study population beneficiaries seen during 2017	Number and percent of practices	Average number of beneficiaries seen
Total	2,857 (100%)	790
1–50	730 (26%)	20
51–200	658 (23%)	115
201–500	521 (18%)	330
501–1,500	562 (20%)	915
1,501 or more	386 (14%)	3,840

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with End-Stage Renal Disease.
Practices are defined by Tax Identification Number (TIN) for those operating in the community, and by CMS Certification Number (CCN) for those operating in Federally Qualified Health Centers, Rural Health Centers, and Critical Access Hospitals billing on the facility claim
Oncologists are defined by individual National Provider Identifier (NPI) and specialty codes for Hematology/Oncology (83) and Medical Oncology (90).

Exhibit 6. Number and Distribution of Average Monthly Outpatient Emergency Department Visits that Do Not Result in Inpatient Admission (Study Population), 2017

	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
All beneficiaries	1,767,000	335,000	462,000	619,000	783,000
Mean number of monthly visits, all beneficiaries	0.060	0.061	0.070	0.047	0.073
Mean monthly Medicare standardized payments, all beneficiaries	$47	$49	$55	$36	$59
Percent of beneficiaries with visits	29.3%	30.4%	31.4%	25.8%	31.5%
Mean number of monthly visits (beneficiaries with visits)	0.205	0.203	0.224	0.182	0.230
(95% Confidence Interval)	(0.204,0.207)	(0.200,0.206)	(0.221,0.226)	(0.179,0.184)	(0.228,0.232)
Median number of monthly visits (beneficiaries with visits)	0.143	0.143	0.167	0.100	0.167
Interquartile range of monthly visits	[0.083-0.250]	[0.083-0.250]	[0.083-0.250]	[0.083-0.200]	[0.083-0.250]

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.
To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below.
Cohorts A through D are defined in Appendix G of the ASCO proposal:
Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma
Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)
Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary
Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers
Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.
Visits for patients with multiple cancers are counted under each cancer type.
Visits are counted from the first cancer diagnosis in 2017 if the beneficiary was newly diagnosed in 2017 or any visits in 2017 if cancer was diagnosed in 2016.

Exhibit 7. Number and Distribution of Average Monthly Unplanned Inpatient Admissions (Study Population), 2017

	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
All beneficiaries	1,767,000	335,000	462,000	619,000	783,000
Mean number of unplanned admissions, all beneficiaries	0.076	0.090	0.097	0.046	0.102
Mean monthly Medicare standardized payments, all beneficiaries	$3,023	$3,964	$3,108	$2,346	$3,217
Percent of beneficiaries with unplanned admissions	28.4%	31.0%	33.5%	20.5%	34.4%
Mean number of unplanned admissions	0.267	0.289	0.290	0.224	0.297
(95% Confidence Interval)	(0.266,0.269)	(0.285,0.293)	(0.286,0.293)	(0.221,0.227)	(0.294,0.299)
Median number of unplanned admissions	0.167	0.167	0.167	0.143	0.180
Interquartile range of unplanned admissions	[0.083-0.333]	[0.083-0.333]	[0.083-0.333]	[0.083-0.250]	[0.083-0.375]

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.
To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below.
Cohorts A through D are defined in Appendix G of the ASCO proposal:
Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma
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Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary
Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers
Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.
Admissions for patients with multiple cancers are counted under each cancer type.
Admissions are counted from the first cancer diagnosis in 2017 if the beneficiary was newly diagnosed in 2017, or any admissions in 2017 if cancer was diagnosed in 2016
An unplanned admission is defined as one that does not meet any of the following criteria:
A procedure is performed that is in one of the procedure categories that are always planned regardless of diagnosis; or
The principal diagnosis is in one of the diagnosis categories that are always planned; or
A procedure is performed that is one of the defined potentially planned procedures and the principal diagnosis is not in the list of defined acute discharge diagnoses.
A few specific, limited types of care are always considered planned: transplant surgery, maintenance chemotherapy/immunotherapy, and rehabilitation; admissions for acute illness or for complications of care are never planned.

Exhibit 8. Distribution of Average Monthly Standardized Medicare Payments for Part B Supportive and Maintenance Drugs and Drug Administration (Study Population), 2017

	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
All beneficiaries	1,767,000	335,000	462,000	619,000	783,000
Mean monthly Medicare payments, all beneficiaries	$91	$71	$107	$73	$153
Percent of beneficiaries with Part B supportive drug use	15.3%	14.0%	19.0%	13.6%	19.5%
Mean monthly Medicare payments, beneficiaries with services	$595	$508	$559	$542	$780
(95% Confidence Interval)	($587,$604)	($489,$526)	($546,$572)	($528,$556)	($767,$793)
Median monthly Medicare payments	$153	$106	$167	$133	$254
Interquartile range	[$59-$672]	[$16-$523]	[$82-$655]	[$65-$613]	[$67-$1,117]

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.
To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below.
Cohorts A through D are defined in Appendix G of the ASCO proposal:
Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma
Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)
Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary
Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers
Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.
Medicare payments for patients with multiple are cancers counted under each cancer type.
Supportive/maintenance drugs are those listed in Appendix I of the ASCO proposal. See Appendix 3 that accompanies this analysis, for corresponding HCPCS codes.
"Standardized" dollars remove the adjustment for geographic locality and other factors.

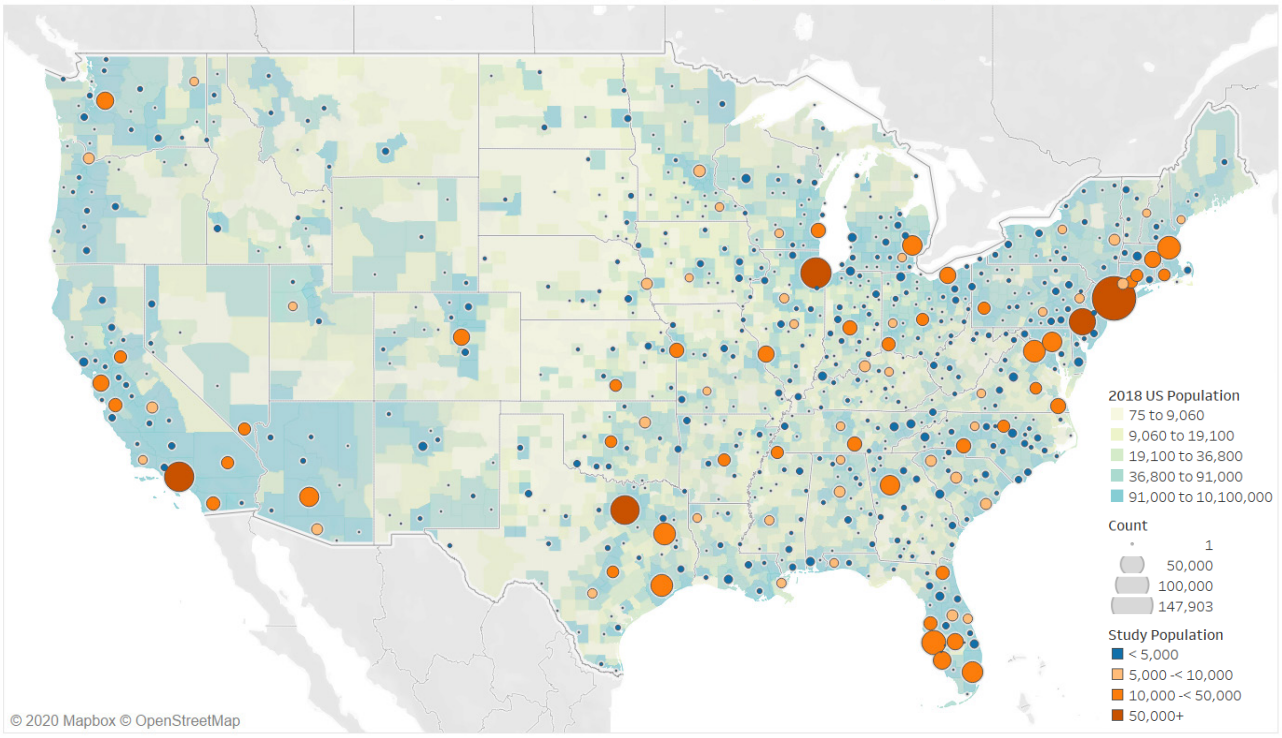
Exhibit 9. Distribution of Average Monthly Standardized Medicare Payments for Part D Supportive and Maintenance Drugs and Drug Administration (Study Population), 2017

	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
All beneficiaries enrolled in Part D	1,305,000	246,000	334,000	468,000	579,000
Mean Part D payments, all Part D beneficiaries	$66	$18	$209	$22	$100
Percent of beneficiaries with Part D supportive drug use	27.7%	17.5%	23.1%	41.7%	28.3%
Mean monthly Medicare payments	$240	$105	$905	$52	$354
(95% Confidence Interval)	($232,$249)	($91,$119)	($869,$941)	($49,$56)	($339,$370)
Median monthly Medicare payments	$4	$2	$5	$5	$4
Interquartile range	[$2-$14]	[$1-$9]	[$1-$64]	[$2-$14]	[$2-$17]

NOTES:
Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not identified with end-stage renal disease.
To be included, the beneficiary must have been seen in CY2016 or CY2017 by a hematological or medical oncologist for one of the selected cancer types below.
Cohorts A through D are defined in Appendix G of the ASCO proposal:
Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma
Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)
Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary
Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers
Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.
Medicare payments for patients with multiple cancers are counted under each cancer type.
Medicare payments comprise the standard benefit amount plus Low-Income Cost Subsidy (LICS) payments.
Supportive/maintenance drugs are those listed in Appendix I of the ASCO proposal. See Appendix 3 that accompanies this analysis for corresponding NDCs.

Exhibit 10. Distribution of Core-Based Statistical Areas (CBSAs) by Number of Medicare Fee-for-Service Beneficiaries (Study Population), 2017 (CBSA of Provider)

(Blue circle represents <5000 Benes; Orange circle represents>=5000 Benes)



Map based on Longitude (generated) and Latitude (generated). Circle color shows details about study population. Size shows sum of Count. Details are shown for CBSA. Map coloring shows 2018 Population by County.

Exhibit 11. Distribution of Standardized Payment per Month of New Patient Care (Study Population), 2017

	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
Total number of beneficiaries	330,625	66,165	102,550	84,590	201,580
Total number of new patient months	415,275	69,100	105,225	87,205	217,705
Mean monthly Medicare payments for total cost of care (TCOC)	$9,837	$11,965	$10,101	$9,104	$10,058
Median TCOC	$6,841	$8,030	$7,342	$6,120	$7,155
Interquartile range TCOC	[$3,295-13,071]	[$3,713-15,506]	[$3,346-13,654]	[$3,249-11,344]	[$3,377-13,458]
Mean payments for hematological/medical oncologist services	$1,014	$1,328	$881	$760	$916
Median payments for hematological/medical oncologist services	$177	$223	$177	$164	$181
Interquartile range	[$107-454]	[$119-646]	[$113-395]	[$103-309]	[$111-437]

NOTES:

Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not diagnosed with end-stage renal disease.

Analysis of the distribution of payments made to hematological/medical oncologists excludes a relatively small number of beneficiaries who received care in Federally-Qualified Health Centers, Rural Health Centers, and Critical Access Hospitals when the attending physician was a hematological/medical oncologist, as claims data do not permit separation of the oncologists' payments from the total cost of care (TCOC).

Cohorts A through D are defined in Appendix G of the ASCO proposal:

Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma

Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)

Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary

Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers

Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.

New patient months are those with the first instance in CY2016 or CY2017 of a cancer diagnosis. Beneficiaries are counted more than once to the extent that they become incident with more than one kind of cancer.

Exhibit 12. Distribution of Standardized Payment per Month of Cancer Treatment (Study Population), 2017

Average monthly Standardized Medicare payments	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
Total number of beneficiaries	896,125	225,870	362,435	255,960	667,855
Total number of cancer treatment months	4,841,800	1,087,390	1,593,530	1,164,110	3,126,310
Mean total cost of care (TCOC)	$9,706	$11,838	$10,154	$8,951	$9,701
Median TCOC	$7,337	$9,191	$8,047	$6,467	$7,170
Interquartile range TCOC	[$3,382-12,975]	[$4,620-15,493]	[$4,032-13,184]	[$2,820-12,149]	[$3,345-12,805]
Mean payments for hematological/medical oncologist services	$1,645	$1,750	$1,365	$1,226	$1,354
Median payments for hematological/medical oncologist services	$89	$88	$85	$85	$88
Interquartile range	[$0-822]	[$0-659]	[$0-354]	[$0-431]	[$0-505]

NOTES:

Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not diagnosed with end-stage renal disease.

Analysis of the distribution of payments made to hematological/medical oncologists excludes a relatively small number of beneficiaries who received care in Federally-Qualified Health Centers, Rural Health Centers, and Critical Access Hospitals when the attending physician was a hematological/medical oncologist, as claims data do not permit separation of the oncologists' payments from the TCOC. Cohorts A through D are defined in Appendix G of the ASCO proposal:

Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma

Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)

Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary

Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers

Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.

Cancer treatment months comprise those in which the beneficiary is administered or takes drugs listed in Appendix 3 of the ASCO proposal, excluding new-patient months as defined in Exhibit 11. See Appendix 2 for the HCPCS codes and NDCs associated with these drugs.

Exhibit 13. Distribution of Standardized Payment per Month of Active Monitoring (Study Population), 2017

Average monthly Standardized Medicare payments	Any beneficiary	Cohort A	Cohort B	Cohort C	Cohort D
Total number of beneficiaries	145,225	27,645	54,375	60,905	106,300
Total number of active monitoring months	230,450	35,845	74,750	81,655	143,845
Mean total cost of care (TCOC)	$3,379	$3,550	$3,769	$2,542	$3,595
Median TCOC	$1,828	$1,910	$2,046	$1,201	$2,015
Interquartile range TCOC	[$657-4,082]	[$736-4,187]	[$823-4,605]	[$395-3,015]	[$793-4,413]
Mean payments for hematological/medical oncologist services	$409	$377	$382	$246	$438
Median payments for hematological/medical oncologist services	$62	$62	$62	$0	$62
Interquartile range	[$0-210]	[$0-219]	[$0-208]	[$0-134]	[$0-224]

NOTES:

Eligible Medicare fee-for-service beneficiaries are those enrolled in Parts A and B, not enrolled in Medicare Advantage, and not diagnosed with End-Stage Renal Disease.

Analysis of the distribution of payments made to hematological/medical oncologists excludes a relatively small number of beneficiaries who received care in Federally Qualified Health Centers, Rural Health Centers, and Critical Access Hospitals when the attending physician was a hematological/medical oncologist, as claims data do not permit separation of oncologists' payments from the TCOC.

Cohorts A through D are defined in Appendix G of the ASCO proposal:

Cohort A: Acute Leukemia, Head and Neck Cancers, Lymphomas, Malignant Melanoma, Multiple Myeloma

Cohort B: Bronchus and Lung, Chronic Leukemia, Endocrine, Kidney, Prostate (w/ chemotherapy)

Cohort C: Brain and Central Nervous System, Breast (female), Gastric, Esophageal, Urinary

Cohort D: Colon and Rectum, Gynecologic, Pancreas, Small Intestine, All other cancers

Cohort counts may add to more than "any cancer" to the extent that a beneficiary has more than one kind of cancer.

Active monitoring months comprise those in which the beneficiary is administered or takes drugs listed in Appendix I of the ASCO proposal and that follow a new-patient or cancer-treatment month as described in Exhibits 11 and 12.

Appendix 1: Diagnoses Used to Identify Study Population

Diagnoses in this table come primarily from Appendix G of the ASCO proposal. The list of diagnoses used at present in the Oncology Care Model (OCM)[4] was used to refine the "other cancers" category in that appendix.

ICD-10 Diagnosis Codes Used to Identify Medicare Beneficiaries with Selected Types of Cancer
Cohort A: Acute Leukemia – C91.0, C91.3, C91.5, C91.6, C91.A, C92.0, C92.3, C92.4, C92.5, C92.6, C92.A, C93.0, C94.0, C94.2, C94.3, C95.0 Head and Neck Cancers – C00, C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C30, C31, C32, C33 Lymphomas – C81, C82, C83, C84, C85, C86, C88 Malignant Melanoma – C43; Multiple Myeloma – C90.xx
Cohort B: Bronchus and Lung – C34, C45 Chronic Leukemia – C91.1, C91.4, C92.1. C93.1; Endocrine – C73, C74, C75 Kidney – C64 Prostate (w/ chemotherapy) – C61
Cohort C: Brain and Central Nervous System – C69, C70, C71, C72; Breast (female) – C50.x1; D05 Gastric – C16; Esophageal – C15 Urinary – C65, C66, C67, C68

[4]For information on the OCM, please see: https://innovation.cms.gov/innovation-models/oncology-care.

Cohort D:

Colon and Rectum – C18, C19, C20

Gynecologic – C51, C52, C53, C54, C55, C56, C57, C58

Pancreas – C25

Small Intestine – C17

Other cancers (unless included above) – D75.81

First four places, including C91.0, C91.3, C91.5, C91.6, C91.A, C920, C92.3, C92.4, C92.5, C92.6, C92.A, C93.0, C94.0, C94.2, C94.3, C95.0, C76.1, C76.2, C76.3, C76.4, C76.5, C76.8, C91.9, C91.Z, C92.2, C92.9, C92.Z, C93.1, C93.3, C93.9, C93Z, C94.4, C94.8, C95.1, C95.9, C91.1, C92.1, D47.1, D47.3, D47.4, C76.0, C91.4, C94.6

First three places, including C21, C65, C66, C67, C68, C50, C26, C37, C38, C40, C41, C44, C46, C47, C49, C48, C4A, C57, C58, C60, C63, C62, C77, C78, C79, C7B, C80, C96, C70, C71, C72, D00, D01, D02, D03, D04, D05, D06, D07, D09, D45, C73, C74, C75, C7A, C51, C52, C53, C54, C55, C15, C16, C00, C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C30, C31, C32, C33, C69, C64, C22, C23, C24, C34, C39, C45, C81, C82, C83, C84, C85, C86, C88, C43, D46, C90, C56, C25, C61, C17, C18, C19, C20

NOTE:

The following additional Appendices can also be found separately on the ASPE PTAC website:

- Appendix 2: HCPCS codes and NDCs associated with Cancer Treatment Drugs Administered or Taken
- Appendix 3: HCPCS codes and NDCs associated with Supportive and Maintenance Care Drugs

Patient-Centered Oncology Payment Model (PCOP):
Additional Quantitative Analysis for the PRT

Trend Analysis: Service Use Measures for Medicare Fee-for-Service Cancer Patients (2014-2018)
July 1, 2020

Background and Research Question

Given that the American Society of Clinical Oncology (ASCO) Patient-Centered Oncology Payment (PCOP) proposal relies in part on savings from reduced use of Emergency Department (ED)/observation stay and hospital inpatient admissions through care coordination, a trend analysis of these services for the Medicare fee-for-service (FFS) population diagnosed with cancer was conducted for the preliminary review team. In addition to overall utilization, the analysis assesses utilization for five conditions that could potentially be averted with more care coordination from a medical/hematological oncologist: nausea, dehydration, central line infection, pain, and sepsis.[i]

The objective of this analysis was not to identify a population that would potentially be treated under the proposed PCOP model, nor to suggest that the selected diagnoses are the only ones that would potentially be amenable to care coordination. Rather, the selected diagnoses were used to assess trends in outpatient ED visits/observation says[1] and inpatient hospitalizations associated with potentially avertable conditions.

Data and Methods

The analysis used the 100-percent Medicare fee-for-service (FFS) claims for calendar years (CY) 2014-2018, accessed through the CMS Chronic Conditions Data Warehouse (CCW) in mid-June 2020. Carrier, inpatient, and outpatient claims were used to identify the FFS population with cancer in each CY with one or more of the diagnosis codes shown in Appendix Table A1, in any position on the claim header. "Cancer months" for a beneficiary are defined to be months of Medicare eligibility from the first cancer diagnosis in the CY until December or the beneficiary's death; if the beneficiary had a cancer diagnosis in the prior year, the first cancer month was set to January. Inpatient and outpatient claims were used to identify ED visits (including observation stays) and hospital discharges. Events were identified in the selected condition groups if the claim contained one of diagnosis codes shown in Appendix Table A2.

Results

Table 1 shows that total ED visits and observation stays per 1,000 cancer months increased modestly from 2014 to 2017 but then dropped slightly in 2018. The same pattern occurred overall for the five selected conditions identified as being potentially amenable to care coordination. Trends varied for the individual conditions; pain accounted for the highest proportion of these events, followed by nausea.

Table 2 shows that the rate of inpatient stays per 1,000 cancer months decreased continuously between 2014 and 2018 for all events, while those for the combined selected conditions increased through 2017 before a slight decrease in 2018. Trends varied by the individual five conditions, with some increasing and some decreasing; dehydration and sepsis accounted for the highest proportion of inpatient stay events among these conditions that might be amenable to care coordination.

Medicare payments per cancer month (for all events and for the five selected diagnoses) increased over time for both service types (ED and observation visits/stays and inpatient stays), but some of this increase is attributable to price inflation.

[1] These events exclude ED visits and observation stays paid by Medicare as part of inpatient care.

Table 1. Trends in Outpatient ED Visits and Observation Stays for Medicare FFS Beneficiaries with a Cancer Diagnosis, CY 2014-2018												
	FFS Beneficiaries With a Cancer Diagnosis 1/	Cancer Months 2/	Users of ED or Observation Services	Outpatient ED Visits/Observation Stays per 1,000 Cancer Months							Medicare Payments per Cancer Month	
Year				Total	Any of the 5 Selected Diagnoses 3/	Nausea	Dehydration	Central Line Infection	Pain	Sepsis	All Events	Events for Selected Diagnoses
2014	5,572,411	53,559,101	1,427,948	46.05	7.23	2.63	1.62	0.01	4.09	0.17	$31.77	$5.47
2015	5,652,215	54,087,282	1,478,128	47.67	7.43	2.65	1.71	0.01	4.16	0.21	$33.10	$5.77
2016	5,651,910	54,458,033	1,510,894	48.76	7.58	2.64	1.85	0.01	4.15	0.25	$34.65	$6.11
2017	5,679,176	54,812,457	1,530,196	49.17	7.65	2.65	1.85	0.01	4.19	0.28	$36.69	$6.54
2018	5,734,055	55,383,517	1,534,989	48.44	7.45	2.56	1.81	0.01	4.04	0.31	$38.95	$6.76

SOURCE: Tabulation of Medicare FFS claims. Medicare payments are not adjusted for inflation.
1/ Appendix Table A1 lists diagnosis codes used to identify cancer patients.
2/ "Cancer months" are months of Medicare FFS eligibility from the first cancer diagnosis in the year until December or death. If a beneficiary had a diagnosis in a prior year, the first month was set to January.
3/ Appendix Table A2 lists diagnosis codes for the selected conditions. This column is not the sum of the individual conditions if events have multiple diagnoses.

Table 2. Trends in Hospital Inpatient Stays for Medicare FFS Beneficiaries with a Cancer Diagnosis, CY 2014-2018												
	FFS Beneficiaries With a Cancer Diagnosis 1/	Cancer Months 2/	Users of Inpatient Hospital Services	Inpatient Stays per 1,000 Cancer Months							Medicare Payments per Cancer Month	
Year				Total	Any of the 5 Selected Diagnoses 3/	Nausea	Dehydration	Central Line Infection	Pain	Sepsis	All Stays	Stays for Selected Diagnoses
2014	5,572,411	53,559,101	1,421,221	46.09	11.35	1.45	4.05	0.21	2.93	4.66	$547.57	$154.88
2015	5,652,215	54,087,282	1,428,366	45.81	11.68	1.37	4.25	0.19	2.92	5.00	$550.14	$159.62
2016	5,651,910	54,458,033	1,431,651	45.66	11.93	1.23	5.25	0.18	2.91	4.59	$564.92	$164.93
2017	5,679,176	54,812,457	1,434,107	45.50	12.13	1.21	5.21	0.17	3.04	4.78	$568.33	$166.21
2018	5,734,055	55,383,517	1,413,642	44.56	12.04	1.15	5.01	0.16	3.08	4.87	$574.72	$170.12

SOURCE: Tabulation of Medicare FFS claims. Medicare payments are not adjusted for inflation.
1/ Appendix Table A1 lists diagnosis codes used to identify cancer patients.
2/ "Cancer months" are months of Medicare FFS eligibility from the first cancer diagnosis in the year until December or death. If a beneficiary had a diagnosis in a prior year, the first month was set to January.
3/ Appendix Table A2 lists diagnosis codes for the selected conditions. This column is not the sum of the individual conditions if events have multiple diagnoses.

APPENDIX: Methods and Limitations

For each calendar year, the earliest cancer diagnosis date of any kind established the onset of cancer for the beneficiary in the CY. Claims for prior years were checked, and if a cancer diagnosis was found, the onset date was reset to January 1 of the current year. If the inpatient admission date or outpatient ED claim from date fell on or after the cancer onset date, the event was included in the analysis. Calendar months of cancer eligibility were counted from the cancer onset date through December of the current year or the month of death.

The analysis is subject to several limitations. First, the broad scope of cancer diagnoses likely includes several that are not amenable to medical or hematological oncology care. The exclusion of basal cell carcinoma was not intended to be an exhaustive exclusion: it was done merely to avoid including a large number of patients who experienced cancer but did not necessarily need oncological care. Second, the population includes patients who did not see an oncologist during the year; to refine the search to those parameters would have drawn out the analysis. Third, the time period examined covers the transition from ICD-9 to ICD-10, and the many-to-many nature of the crosswalk may have created a small discontinuity between CY2014 and CY2016-2018.

Table A1. Diagnosis Codes Used to Identify FFS Beneficiaries with Cancer

ICD-9	ICD-10
140.0- through 209.3- 230.-- through 234.-- Excluding 173.01, 173.11, 173.21, 173.31, 173.41, 173.51, 173.61, 173.71, 173.81, 173.91, 238.79, 207.1-	C00.---- through D09.---- Excluding C44.01--, C4411--, C44.21--, C44.31--, C44.41--, C44.51--, C44.61--, C44.71--, C44.81--, C44.91--, C88.8---

Notes: A hyphen indicates that any character is acceptable. Codes may occur in any position on the claim header. Exclusions are typically for basal cell carcinoma, which is frequently found in the Medicare population but which typically does not require extended oncological care.

Table A2. Diagnosis Codes Used to Identify Selected Conditions Amenable to Care Coordination

Condition	ICD-9	ICD-10
Nausea	787.0-	R11.----
Dehydration	276.51	E86.0---
Central line infection	999.3-	T80.2---
Pain	789.--, 338.3-, 608.9-, 625.9-, 625.5-, 625.8-, 629.0-, 629.1-, 568.82, 787.99, 629.89	R10.----, R16.0---, R16.1---, R19.0---, R19.3---, R18.0---, R18.8---, R19.8---, N50.9---, R19.4---, G89.3---, N94.89-
Sepsis	038.9-, 995.9-, 785.52	R65.----, A41.9---

Note: A hyphen indicates that any character is acceptable. The diagnosis codes listed could appear in any position on the inpatient or outpatient header. Outpatient claims were identified as having an ED or observation stay component if the claim had a revenue center code 0450 through 0459 or 0762.

[i] Nausea, dehydration, and central line infection are mentioned in the PCOP proposal. Pain is mentioned in the following articles: Mendenhall MA, Dyehouse K, Hayes J, et al. Practice Transformation: Early Impact of the Oncology Care Model on Hospital Admissions. *J Oncol Pract*. 2018;14(12):e739-e745; and Caterino JM, Adler D, Durham DD, et al. Analysis of Diagnoses, Symptoms, Medications, and Admissions Among Patients With Cancer Presenting to Emergency Departments. *JAMA Netw Open.* 2019;2(3):e190979. Sepsis was mentioned by ASPE staff.