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Sickle Cell Legislative Report, 2025

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List of Abbreviations

ACIP — Advisory Committee on Immunization Practices
ACO — Accountable Care Organization
CARES — Coordinating Aligned, Relationship-centered, Enhanced Support
CP — Community Partner
HU — Hydroxyurea
LOS — Length of stay
LTSS — long term support and services
MCO — Managed Care Organization
MH — MassHealth
MHDL — MassHealth Drug List
MTM — Medication Therapy Management
NHLBI — National Heart, Lung, and Blood Institute
RBC — Red blood cell
SCD — Sickle Cell Disease
TPL — Third party liability
VOE — Vaso-Occlusive Event

Background

Sickle Cell Disease (SCD) is an inherited disorder of hemoglobin, which is a protein found in red blood cells (RBC). Hemoglobin is responsible for carrying oxygen in the blood to the body's tissues. A person with SCD inherits genetic material that leads to an abnormality in the hemoglobin protein, causing red blood cells to become sickle-shaped, instead of assuming a typical round shape. Sickle-shaped red blood cells can become stuck in small blood vessels where they clump together and block the delivery of oxygen (Centers for Disease Control and Prevention, 2024).

A variety of clinical manifestations may arise in patients with SCD. Complications can include damage to the spleen and the trapping of excess blood within the spleen, resulting in an increased risk of infections. Loss of oxygen delivery to organs can also result in pain crises, blood clots, damage to bone tissues and cell lines, loss of ability to produce new blood cells, stroke, heart attack, and a clinical syndrome called acute chest syndrome. Long-term complications can include anemia, neurologic effects and seizures, heart, lung, kidney, and liver complications, retinal damage, and growth defects, which together contribute to reduced life expectancy (Centers for Disease Control and Prevention, 2024).

Average life expectancy for people with SCD in the United States is reduced by more than 20 years compared to life expectancy for the general population (Centers for Disease Control and Prevention 2024). Access to care, to both longstanding and newer evidence-based treatments, has been shown to contribute to improved health outcomes and increased life expectancy (Houwing et al. 2021).

This report is mandated by Mass. General Laws c.118E § 80, and contains an overview of the population of MassHealth enrollees who have SCD, the services and medications they utilize, and recommendations for future management of this population. The following report provides an update to the first report published in 2023 (Massachusetts Executive Office of Health and Human Services, Office of Medicaid 2023).[1] This second report addresses all areas of examination stipulated in Mass. General Laws c.118E § 80. This report is organized into "key questions" and includes supplemental data and information where the authors deemed it helpful for understanding MassHealth's role in the care of patients with SCD. Data presented in this report represent only MassHealth enrollee administrative data, and MassHealth policies and covered services. The study period for this report was July 1, 2022 - June 30, 2024.

Key Question 1. What is the prevalence of Sickle Cell Disease among MassHealth enrollees?

Between July 1, 2022, to June 20, 2024, 1,831 MassHealth enrollees had a diagnosis of Sickle Cell Disease (SCD) from a total MassHealth enrollment of approximately 2 million people (see

[1] In keeping with the most up to date data on SCD, data definitions for the disease in this report vary from those in the previous MassHealth SCD report and therefore, the data in these reports should not be compared.

Table 1). The age group with the largest number of enrollees with SCD was 21 to 45 years of age (716 enrollees, 39.1% of all enrollees with SCD).

Table 1. Population of Medicaid and CHIP Enrollees with Sickle Cell Disease by Age Group (per age as of June 30, 2024), July 1, 2022-June 30, 2024

Age Group	Ages 0-5 N	Ages 0-5 %	Ages 6-12 N	Ages 6-12 %	Ages 13-20 N	Ages 13-20 %	Ages 21-45 N	Ages 21-45 %	Ages 46-64 N	Ages 46-64 %	Ages 65+ N	Ages 65+ %	Total Population N
1. Total	246	13.44 %	269	14.69 %	327	17.86 %	716	39.10 %	206	11.25%	67	3.66%	**1,831**
2. Dually Eligible	0	0.00%	0	0.00 %	0	0.00%	143	52.19 %	71	25.91%	60	21.90 %	**274**
3.Non-Dually Eligible	246	15.80 %	269	17.28 %	327	21.00 %	>562*	36.10 %*	135	8.67%	<11*	<5%*	**1,557**
4.Continuous 24 Months	122	10.36 %	213	18.08 %	238	20.20 %	422	35.82 %	139	11.80%	44	3.74%	**1,178**
5.No Continuous younger than 2 Years Old	69	100.00%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**69**
6.Continuous 12 Months Over 2 Years Old	36	8.02%	42	9.35 %	68	15.14 %	229	51.00 %	57	12.69%	17	3.79%	**449**
7.Continuous <12 Months Over 2 Years Old	19	14.07 %	14	10.37 %	21	15.56 %	65	48.15 %	<11*	<5%*	<11*	<5%*	**135**

Notes: An enrollee is continuously enrolled if there is no gap in eligibility from July 1, 2022, through June 30, 2024, greater than 45 days and the enrollee must be eligible on July 1, 2022, and on June 30, 2024. This is referred to as the 24 months continuous enrollment requirement. "Age is calculated as of June 30, 2024.

1. Total - Exclude third-party liability (TPL), include both dual eligible for Medicare and non–dual eligible, no continuous enrollment requirement. N2+N3 = N1; N4+N5+N6 = N1

2. Dually Eligible - Exclude TPL, include dual eligible only, no continuous enrollment requirement.

3. Non–Dually Eligible - Exclude TPL, exclude dual eligible, no continuous enrollment requirement.

4. Continuous 24 Months - Exclude TPL, both dual eligible and non–dual eligible, 24 months continuous enrollment requirement.

5. No Continuous Enrollment younger than 2 Years Old - Exclude TPL, both dual eligible and non–dual eligible.

6. Continuous 12 Months older than age 2 - Exclude TPL, both dual eligible and non–dual eligible, 12 months continuous enrollment requirement.

7. Continuous <12 Months older than age 2 - Exclude TPL, both dual eligible and non–dual eligible, <12 months continuous enrollment requirement

* Values referring to ten or fewer enrollees (and totals allowing back-calculation) have been suppressed to conform with MassHealth privacy guidelines.

Key Question 2. What medications and treatments does MassHealth cover for enrollees with Sickle Cell Disease?

MassHealth covers a wide range of medications for all members, as outlined on the MassHealth Drug List, including a subset of medications described below that are specifically applicable to caring for members with Sickle Cell Disease.

Available Covered Medications

Available covered medications for MassHealth enrollees include Droxia® (hydroxyurea) capsules and hydroxyurea (HU) 500 mg capsules available without prior authorization. The other disease-modifying agents, Adakveo® (crizanlizumab-tmca), Casgevy® (exagamglogene autotemcel), Endari® (l-glutamine oral powder), Lyfgenia® (lovotibeglogene autotemcel), and Siklos® (hydroxyurea) tablets are available with prior authorization. Approval for non-gene therapy agents requires appropriate age, specialist involvement, use of hydroxyurea (as appropriate), documentation of sickle cell crises in the previous 12 months and, where appropriate, medical necessity of requested formulation such as Siklos® (hydroxyurea) tablet. This is due to the higher cost associated with this agent. Approval for gene therapy agents requires appropriate age, specialist involvement, genetic testing, use of hydroxyurea (as appropriate), documentation of sickle cell crises in the previous two years, attestation that the patient is clinically stable and eligible for a transplant, and where appropriate, medical necessity of requested agent, such as Lyfgenia® (lovotibeglogene autotemcel). This is also due to the higher cost associated with this agent. Oxbryta® (voxelotor) was removed from the MassHealth Drug List (MHDL) and is no longer covered as of January 2025 due to withdrawal from the market.

Infection Prevention

Individuals with SCD have an increased risk of severe bacterial infection resulting from reduced or absent splenic function. The result is an extremely elevated risk of sepsis and meningitis, primarily due to the bacteria *Streptococcus pneumoniae* (Ochocinski et al. 2020). Therefore, the National Heart, Lung, and Blood Institute (NHLBI) recommends that all newborns identified with a form of SCD called Hb SS (which is one form of SCD) should promptly receive twice-daily prophylactic penicillin at least until the age of five years old, as well as pneumococcal vaccination and all other age-appropriate vaccinations (Yawn et al. 2014). The Advisory Committee on Immunization Practices (ACIP) specifically recommends that children with SCD receive four doses of either the 15-valent or 20-valent conjugate pneumococcal vaccine before age 2 (Centers for Disease Control and Prevention 2025). Children who started vaccinations with previously recommended 13-valent conjugate pneumococcal vaccine can finish with PCV15 or PCV20 without starting over. Prevnar 20®, the 20-valent pneumococcal conjugate vaccine (PCV20) received an expanded usage for persons aged 6 weeks to 17 years on April 27, 2023 (Pfizer Inc. 2021). In June 2023, ACIP recommended use of PCV20 as an option for pneumococcal conjugate vaccination of persons younger than 19 years according to currently recommended PCV15 dosing and schedules (Centers for Disease Control and Prevention 2023). Table 2 shows utilization information for pneumococcal vaccines for the above-mentioned group. MassHealth (MH) is performing well on this measure as 99% of enrollees in this population received the vaccine.

Table 2. Pneumococcal Vaccinations among MassHealth Enrollees < 2 years old with Sickle Cell Disease, July 1, 2022 - June 30, 2024

Total # of enrollees < age 2 with SCD[ab]	Enrollees with at least 1 pneumococcal vaccination during 7/1/22 to 6/30/24 N	Enrollees with at least 1 pneumococcal vaccination during 7/1/22 to 6/30/24 %
69	68	99%

a. Age group assigned using each beneficiary's age as of 6/30/24.
b. Results include enrollees who were enrolled between 7/1/22 and 6/30/24 and had at least two claims with a diagnosis of SCD during that period (see ICD-10 codes listed in Appendix I). Due to the short age span evaluated, the enrollees were not required to have continuous enrollment for the full study period.
Pneumococcal vaccine use was identified through medical claims using specific CPT codes (See Appendix II).

Disease-Modifying Agents

Hydroxyurea (HU) is the mainstay treatment of SCD and reduces pain and other vaso-occlusive complications, decreases hospitalization, and improves overall survival. Hydroxyurea is also thought to have other beneficial effects, such as decreasing inflammation. However, it was previously not available for children 6 months of age to 2 years. On April 4, 2024, the FDA approved Xromi® (hydoxyurea) oral solution for use in pediatric SCD patients aged 6 months to < 2 years of age. Xromi® (hydoxyurea) became available in early 2025 (*Xromi Prescribing Information* 2025).

The NHLBI guidelines strongly recommend the use of HU for adults with SCD who have experienced three or more moderate to severe pain crises in a 12-month period, pain or chronic anemia interfering with daily activities, or with severe or recurrent episodes of acute chest syndrome. In addition, they give a strong recommendation for use in children 9 to 42 months of age and a moderate recommendation for children and adolescents 42 months of age or older regardless of disease severity (Yawn et al. 2014). In Table 3, we demonstrate the use of HU in MassHealth patients with SCD.

Table 3. Number of Days of Hydroxyurea Use among MassHealth (MH) Enrollees with Sickle Cell Disease, July 1, 2022 - June 30, 2024

Age group[s]	Total # of enrollees with SCD[b]	Percentage of enrollees with any HU use	1 to 90 days N[d]	1 to 90 days %[d]	91 to 180 days N[d]	91 to 180 days %[d]	181 to 270 days N[d]	181 to 270 days %[d]	More than 270 days N[d]	More than 270 days %[d]
Children Ages 33 months to 5 years	97	30.9%	<11	<5%	<11	<5%	<11	<5%	19	19.6%
Ages 6 to 12	205	49.3%	<11	<5%	<11	<5%	<11	<5%	75	36.6%
Ages 13 to 20	230	48.3%	<11	<5%	12	5.2%	18	7.8%	72	31.3%
Total-Children (Ages 33 months to <21 years)	532	45.5%	20	3.8%	25	4.7%	31	5.8%	166	31.2%
Ages 21 to 30	178	47.2%	20	11.2%	11	6.2%	19	10.7%	34	19.1%
Ages 31 to 45	186	30.6%	<11	<5%	11	5.9%	<11	<5%	33	17.7%
Ages 46 to 54	56	25.0%	<11	<5%	<11	<5%	<11	<5%	<11	-
Ages 55 to 64	42	16.7%	0	0.0%	<11	<5%	<11	<5%	<11	<5%
Ages ≥ 65	<11	<5%	0	0.0%	0	0.0%	0	0 .0%	0	0.0%
Total-Adult (≥ 21 years)	>462	34.7%	30	6.4%	25	5.4%	27	5.8%	80	17.1%

Age group[a]	Total # of enrollees with SCD[b]	Percentage of enrollees with any HU use	1 to 90 days N[d]	1 to 90 days %[d]	91 to 180 days N[d]	91 to 180 days %[d]	181 to 270 days N[d]	181 to 270 days %[d]	More than 270 days N[d]	More than 270 days %[d]
Total	>994	>40.0%	50	>5.0%	50	>5.0%	58	->5.8%	246	->24.6%

a. Age group assigned using each beneficiary's age as of 6/30/24.
b. Results include enrollees who were enrolled with full or comprehensive benefits between 7/1/22 and 6/30/24 and had at least two claims with a diagnosis of SCD during that period (see ICD-10 codes listed in Appendix I).
c. Definition of children (< 21 years of age) based on the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit assignment.
d. Some fields contain less than 11 enrollees and have been omitted to protect confidentiality.
Hydroxyurea use was identified using the GSNs (see Appendix II) reported on pharmacy claims. For this analysis, the number of days of HU use reflects the number of calendar days from 7/1/22 through 6/30/24 that a beneficiary was covered with a prescription for HU.
To align with the NIH recommendation for hydroxyurea use for people aged 9 months and older, this analysis includes people who were at least 9 months old for the entire study period.

Endari® (l-glutamine oral powder) is approved by the Food and Drug Administration (FDA) for individuals 5 years of age or older with SCD to reduce acute complications. This agent is the L-enantiomer of the amino acid glutamine and has been shown to be safe and effective as a maintenance treatment for SCD. The mechanism of action of l-glutamine in treating SCD is not fully understood, but it is thought that l-glutamine improves the nicotinamide adenine dinucleotide redox potential in sickle red blood cells (RBCs), lessening the oxidative damage done to sickle RBCs. All RBCs are subject to oxidative damage, but sickle RBCs are more susceptible than normal RBCs, leading to the chronic hemolysis and vaso-occlusive events associated with SCD (*Endari Prescribing Information* 2025). In Table 4, we demonstrate the use of Endari® (l-glutamine) in MassHealth patients with SCD by age.

Table 4. Endari® (l-glutamine) Use among MassHealth (MH) Enrollees with Sickle Cell Disease, July 1, 2022 - June 30, 2024

Age group[a]	Total # of enrollees with SCD[b]	Percentage of enrollees with any Endari use
Children (≥ 5 years and < 21 years)[c]	471	2.3%
Adults (≥ 21 years)	467	2.6%
Total	938	2.5%

a. Age group assigned using each beneficiary's age as of 6/30/24. (Age range of ≥ 5 years of age based on current FDA labeling of Endari®.
b. Results include enrollees who were enrolled with full or comprehensive benefits between 7/1/22 and 6/30/24 and had at least two claims with a diagnosis of SCD during that period (see ICD-10 codes listed in Appendix I)
c. Definition of children (< 21 years of age) based on the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit assignment
Endari® use was identified using the GSNs (see Appendix II) reported on pharmacy claims. For this analysis, the number of days of Endari® use reflects the number of calendar days from 7/1/22 through 6/30/24 that a beneficiary was covered with a prescription for Endari®.

SCD is also associated with chronic inflammation which causes higher levels of cell adhesion proteins such as P-selectin. These proteins make both the blood vessels and certain blood cells stickier and prone to clusters in the bloodstream. Adakveo® (crizanlizumab-tmca) is the first humanized anti-P-selectin monoclonal antibody (*Adakveo Prescribing Information* 2024). Oxbryta® (voxelotor) is an oral HbS (sickle hemoglobin) polymerization inhibitor. Nonclinical studies suggest that voxelotor may inhibit RBC sickling, improve RBC deformity and improve anemia (as measured by an increase in hemoglobin) (*Oxbryta Prescribing Information* 2023). Adakveo® (crizanlizumab-tmca) is approved to reduce the frequency of vaso-occlusive crises in

individuals 16 years of age or older with SCD (*Adakveo Prescribing Information* 2024). Oxbryta® (voxelotor) was approved for the treatment of SCD in individuals 12 years of age and older with SCD. This expanded to those 4 to 11 years of age with SCD in December 2021 (*Oxbryta Prescribing Information 2023)*. Tables 6 and 7 demonstrate the use of Adakveo® and Oxbryta® among MassHealth recipients with SCD from July 1, 2022 to June 30, 2024.

Notably, on September 25, 2024, Oxbryta® (voxelotor) was voluntarily withdrawn from all markets where it was approved, including the United States (Pfizer Inc. 2024). All clinical trials and expanded access programs for voxelotor were also discontinued. The withdrawal stemmed from clinical data showing that the benefit no longer outweighs the risk as post marketing clinical trials showed a higher rate of vaso-occlusive crisis and death compared to placebo. The FDA instructed healthcare professionals to stop prescribing Oxbryta® (voxelotor), so while we demonstrate its use in Table 5, it is no longer prescribed to SCD patients in the United States (U.S. Food and Drug Administration 2024).

Table 5. Adakveo® (crizanlizumab-tmca) Use among MassHealth (MH) Enrollees with Sickle Cell Disease, July 1, 2022 - June 30, 2024

Age group[a]	Total # of enrollees with SCD[b]	Percentage of enrollees with any Adakveo use[d]
Children (≥ 16 years and < 21 years)[c]	142	<7.7%
Adults (≥ 21 years)	467	5.6%
Total	609	<6.1%

a. Age group assigned using each beneficiary's age as of 6/30/24. (Age range of ≥ 16 years of age based on current FDA labeling of Adakveo®).
b. Results include enrollees who were enrolled with full or comprehensive benefits between 7/1/22 and 6/30/24 and had at least two claims with a diagnosis of SCD during that period (see ICD-10 codes listed in Appendix I).
c. Definition of children (< 21 years of age) based on the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit assignment.
d. Some fields contain less than 11 enrollees and have been omitted to protect confidentiality.
Adakveo® use was identified using the GSN codes for pharmacy claims and J-codes reported on medical claims (see Appendix II). For this analysis, the number of doses of Adakveo® use reflects the number of calendar days from 7/1/22 through 6/30/24 that a beneficiary had a pharmacy or medical claim for Adakveo®. Typical dosing is 5 mg/kg by intravenous infusion at Week 0, Week 2, and every 4 weeks thereafter.

Table 6. Oxbryta® (voxelotor) Use among MassHealth (MH) Enrollees with Sickle Cell Disease, July 1, 2022 - June 30, 2024

Age group[a]	Total # of enrollees with SCD[b]	Percentage of enrollees with any Oxbryta use[d]
Children (≥ 4 years and < 21 years)[c]	500	<2.2%
Adults (≥ 21 years)	467	5.6%
Total	**967**	**<3.8%**

a. Age group assigned using each beneficiary's age as of 6/30/24. (Age range of ≥ 4 years of age based on current FDA labeling of Oxbryta®).
b. Results include enrollees who were enrolled with full or comprehensive benefits between 7/1/22 and 6/30/24 and had at least two claims with a diagnosis of SCD during that period (see ICD-10 codes listed in Appendix I).
c. Definition of children (< 21 years of age) based on the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit assignment.
d. Some fields contain less than 11 enrollees and have been omitted to protect confidentiality.

Oxbryta® use was identified using the GSNs (see Appendix II) reported on pharmacy claims. For this analysis, the number of days of Oxbryta® use reflects the number of calendar days from 7/1/22 through 6/30/24 that a beneficiary was covered with a prescription for Oxbryta®.

New Medications and the Drug Pipeline

Casgevy® (exagamglogene autotemcel) and Lyfgenia® (lovotibeglogene autotemcel) received FDA approval on December 8, 2023. They are the first gene therapies approved to treat SCD. Casgevy® (exagamglogene autotemcel) utilizes CRISPR/Cas9, a type of genome editing technology, to modify hematopoietic stem cells. The modified blood stem cells increase the production of fetal hemoglobin (HbF). Increased levels of HbF in patients with SCD prevents the sickling of red blood cells. Lyfgenia® (lovotibeglogene autotemcel) uses a lentiviral vector (gene delivery vehicle) to genetically modify a patient's blood stem cells to produce $HbAT^{87Q}$, a gene-therapy derived hemoglobin that functions like hemoglobin A. Red blood cells containing $HbAT^{87Q}$ have a lower risk of sickling and blocking blood flow. Both agents are made from the patient's own blood stem cells, which are modified, and transplanted back to the patient as a one-time, single-dose infusion. During the two-year study period, there were zero MassHealth enrollees with claims for Casgevy® or Lyfgenia®, likely due to receiving FDA-approval later in the time period (U.S. Food and Drug Administration 2023).

The MassHealth Drug List (MHDL), like other drug formularies, is routinely updated based on new drug availability, indications, route of administration, and according to nationally recognized guidelines and established medical and pharmacy treatment standards. Routine updates safeguard access to critical medications for rare, chronic, and acute illnesses including SCD. MassHealth continues to follow the emerging clinical pipeline around new treatment options which are advancing rapidly. Many new treatment options are undergoing continued review by the FDA (refer to Table 7 below). Newer options may provide another potentially curative option for SCD, in addition to Hematopoietic Stem Cell Transplant. MassHealth will continue to evaluate and facilitate addition to the MHDL for any medications that gain FDA-approval for the management of SCD.

Table 7. Investigational Agents for Sickle Cell Disease* (IPD Analytics 2025)

Drug Name	Manufacturer	Investigational Indication	Mechanism of Action	Route	Clinical Trial Data	Anticipated FDA Review/Phase
Pyrukynd• (mitapivat)†	Agios	SCD	Pyruvate kinase activator	oral	N/A	sNDA submission anticipated 2nd half 2025
Inclacumab	Global Blood Therapeutics; Pfizer	SCD	P-Selectin inhibitor	IV	N/A	Phase III
GBT601	Global Blood Therapeutics; Pfizer	SCD	Hg-oxygen affinity enhancer	oral	N/A	Phase III
FT-4202 (etavopivat)	Forma Therapeutics, Novo Nordisk	SCD	Pyruvate kinase activator	oral	N/A	Phase III
Altemia (omega-3 DHA)	Sancillo, Micelle BioPharma	SCD	Lipid replacement therapy	Oral	N/A	Phase III

Drug Name	Manufacturer	Investigational Indication	Mechanism of Action	Route	Clinical Trial Data	Anticipated FDA Review/Phase
CSL889 (hemopexin)	CSL Behring	SCD	Antioxidant	IV	N/A	Phase III
Casgevy• (exagamglogene autotemcel)‡	Vertex, CRISPR Therapeutics	SCD in patients 2 years to 11 years	Autologous, ex vivo CRISPR gene editing	IV single dose	N/A	Phase III
Adakveo• (crizanlizumab)±	Novartis	SCD in patients ≥12 years of age with or without HU use	Selectin inhibitor	IV	N/A	Phase III

BLA=Biologics Licensing Application, EHA=European Hematology Association, Hgb=hemoglobin, HSC=hematopoietic stem cell, IV=intravenous, MDS=myelodysplastic syndrome, N/A= not available, SCD=sickle cell disease, sNDA= supplemental new drug application, VOC=vaso-occlusive crises, VOE=vaso-occlusive events

*Not all-inclusive. Only listed those in phase III trials or those currently under review by the Food & Drug Administration

†Currently approved for the treatment of hemolytic anemia in adults with pyruvate kinase deficiency

‡Currently approved for the treatment of sickle cell disease in patients 12 years and older with recurrent vaso-occlusive crises

±Currently approved to reduce the frequency of vaso-occlusive crises in adults and pediatric patients aged 16 years and older with sickle cell disease

Medication Assistance Services

Evidence shows that properly targeted medication adherence programs can improve SCD treatment (Shih and Cohen 2020). MassHealth launched a medication therapy management (MTM) program for enrollees with SCD in June 2024. The program aims to improve overall health outcomes, optimize medication therapy and adherence, identify drug-related problems, and improve access to medication and clinical care. Currently, enrollees in a Fee-for-Service/Primary Care Clinician/Primary Care Accountable Care Organization plan are eligible for the MTM program if they have at least two diagnosis codes for SCD within the past year.

MTM participants receive a letter informing them of program inclusion, and they may opt-out at any time. Participating enrollees receive a call to schedule a complete medication review with a clinical pharmacist. Calls are available via phone or web, and interpreter services are available. During the call, a pharmacist discusses an enrollee's medications, side effects, drug interactions, preventative screenings, and other healthcare concerns the enrollee may have. After the call, the enrollee is mailed a personal medication list and to-do list with any recommendations to discuss with their providers. The pharmacist also reaches out to the enrollee's healthcare providers as appropriate with any recommendations.

The program has an average of 250 participating enrollees and has successfully completed almost 100 complete medication reviews within the first year since launch. So far, over 200 recommendations have been made to providers due to the MTM program, including recommendations on vaccines, preventative care, SCD medication initiation, adherence concerns, dosing clarifications, and coordination of access to care.

Pain Management

Pain management is a vital component of SCD therapy as acute pain episodes are the most common reason for SCD patients to seek medical attention. Individuals who continue to have acute pain episodes, despite the use of preventive therapy mentioned above, should have tailored home pain regimen plans. Nonpharmacologic therapies (e.g., relaxation/breathing exercises) and non-opioids (e.g., nonsteroidal anti-inflammatory drugs [NSAIDs] or acetaminophen) should be trialed for mild pain as appropriate. Gabapentinoids, serotonin norepinephrine reuptake inhibitors, and tricyclic antidepressants may also be appropriate non-opioids for chronic pain. Short-acting opioids are administered for moderate to severe pain, with some individuals requiring continuous opioid therapy or chronic pain management involving long-acting opioids with as-needed short-acting opioids for breakthrough pain (American Society of Hematology 2020). Opioids are managed with various restrictions as highlighted on the MHDL website.

This report does not evaluate the utilization of pain medications as it is difficult to assess the nature of the event being treated without access to medical records. Isolating their use specifically in SCD pain crises is challenging, as there are many other acute and chronic conditions for which individuals may also be prescribed these medications. MassHealth currently has numerous non-opioids available without prior authorization. Additionally, behavioral health services are covered, including but not limited to individual therapy, crisis intervention services, and recovery coaches. Behavioral health services are integral to addressing and managing chronic pain like that experienced by enrollees with SCD (Brandow et al. 2020).

Key Question 3. Do health care services covered by MassHealth meet all the needs of enrollees with Sickle Cell Disease?

In 2014, an expert panel was convened by the National Institutes of Health's National Heart, Lung, and Blood Institute (NHLBI) (National Institutes of Health, National Heart, Lung, and Blood Institute 2014). This is the most recent national panel of this kind to produce clear clinical and health service recommendations for the treatment of Sickle Cell Disease (SCD). It has been cited by the National Academy of Science and the Sickle Cell Disease Association of America as the current best practices for SCD (National Academies of Sciences, Engineering, and Medicine 2020, (Sickle Cell Disease Association of America 2025). Table 8 below lists the recommendations and the strength of the recommendation. As demonstrated in the table, MassHealth covers all of these recommendations.

Table 8. NHLBI Sickle Cell Disease Health Service Recommendations

Recommendation	Strength of Recommendation (strong/moderate/weak)	MassHealth Coverage (yes/no)
Daily oral prophylactic penicillin up to the age of 5 years	Strong	Yes
Annual transcranial Doppler examinations from the ages of 2 to 16 years in those with sickle cell anemia	Strong	Yes
Long-term transfusion therapy to prevent stroke in those children with abnormal transcranial Doppler velocity (≥200 cm/s)	Strong	Yes

Recommendation	Strength of Recommendation (strong/moderate/weak)	MassHealth Coverage (yes/no)
Rapid initiation of opioids for treatment of severe pain associated with a vaso-occlusive crisis	Strong	Yes
Incentive spirometry in patients hospitalized for a vaso-occlusive crisis	Strong	Yes
Analgesics and physical therapy for treatment of avascular necrosis	Strong	Yes
Angiotensin-converting enzyme inhibitor therapy for microalbuminuria in adults with SCD	Strong	Yes
Referral to expert specialists for consideration of laser photocoagulation and for echocardiography to evaluate signs of pulmonary hypertension for children and adults with proliferative sickle cell retinopathy	Strong	Yes
Hydroxyurea therapy for those with 3 or more severe vaso-occlusive crises during any 12-month period, with SCD pain or chronic anemia interfering with daily activities, or with severe or recurrent episodes of acute chest syndrome	Strong	Yes
Hydroxyurea treatment without regard to the presence of symptoms for infants, children, and adolescents	Moderate	Yes
Preoperative transfusion therapy to increase hemoglobin levels to 10 g/dL for those with SCD anemia	Strong	Yes
Screen for iron overload in SCD patients	Strong	Yes
Iron chelation therapy when indicated	Moderate	Yes

In addition to covering all the recommended services listed in Table 8, MassHealth also covers best practice services such as transitional programming, care coordination (detailed in the response to "Key Question 4" of this report), gene therapies, additional medications, and medication management assistance (detailed in response to "Key Question 2" of this report).

Key Question 4. To what extent does MassHealth cover programs or services that prepare, transfer, and integrate transition-aged youth enrollees from pediatric to adult care?

Care coordination represents a valuable resource for many patients and families with Sickle Cell Disease (SCD). The early childhood presentation of SCD combined with socioeconomic disparities often experienced by those diagnosed with the disease, alongside the heterogeneous and changing nature of the disease's manifestations, puts a high degree of burden on patients and families for care engagement. To that end, care coordination and care management support can play an important role for MassHealth enrollees with SCD.

MassHealth supports a wide range of care coordination and care management services that may be accessed by enrollees with SCD. These and other care coordination and management programs provided by MassHealth can provide crucial assistance throughout the lifespan, including as youth members with SCD transition from pediatric to adult care.

For example, MassHealth enrollees younger than 21 are eligible for a Targeted Case Management benefit, called MassHealth Coordinating Aligned, Relationship-centered, Enhanced Support (CARES) for Kids Program. CARES for Kids is designed to lighten the burden for families and better serve the needs of the top 1-1.5% highest-risk children and youth with medical complexities, such as those with SCD. CARES for Kids participants receive comprehensive, high-touch care coordination that is embedded in their primary care or pediatric

specialty care clinic. CARES providers coordinate prompt, family-centered, and individualized care across health, educational, state agency, and social service systems.

The Special Kids Special Care program provides specialized care coordination services for children in foster care who have complex medical needs, including SCD. Children in the Department of Children and Families (DCF) custody are all enrolled in MassHealth.

MassHealth also supports a range of care coordination programs provided by its ACOs, which serve large proportion of MassHealth enrollees. Accountable Care Organizations are contractually obligated and financially incentivized to provide comprehensive, coordinated care for their enrollees through care coordination programming, such as disease-specific care management programs, general care coordination and navigation services, and/or Community Partners (CP) programs. Accountable Care Organization care management programs include a comprehensive assessment of medical needs, social determinants of health, and care needs to deploy further resources in the MassHealth program or other programs to support their care. Care management programs are designed to engage providers in the enrollee's care team to coordinate care and help patients and families navigate the care system. They may also provide medication adherence support, appointment navigation support, identification of further gaps and needs, and building self-efficacy in disease management. Care plans created by such teams can address contingency management including crisis management, recognition of red flag symptoms, the establishment of pain management plans, lessons on self-advocacy, genetic counseling, adherence goals, and more. These efforts can involve a diverse set of supporting team members including nurse care managers, community health workers, social workers, dieticians, health educator, peer supports, education liaisons, behavioral health staff, on-call staff to reach out to for after-hours needs, and more.
Community Partner programs are specifically designed for qualifying enrollees with complex needs. Children with SCD who are 3 years or older and require long-term supports and services (LTSS) may qualify for the MassHealth LTSS Community Partners (CP) program. Adolescents and young adults with SCD who are 18 years or older with serious mental illness may qualify for the MassHealth Behavioral Health CP, or the BH CP in Nursing Facility CP program.
Community Partners programs are community-based entities that help coordinate care for enrollees receiving care through an Accountable Care Organization (ACO) and/or Managed Care Organization (MCO), Department of Mental Health (DMH) Clients, and Nursing Facility Clients by leveraging the expertise of community-based organizations. Some of the functions served by CP programs include the following: developing a Person-Centered Treatment Plan reflecting the preferences, goals, and needs of the CP enrollee; coordinating and managing care across services including medical, behavioral health, long-term services and supports, and other state agency services, as appropriate; and, importantly for adolescents and young adults, providing supports for transitions of care.

Key Question 5. How are emergency service providers trained and prepared to treat and manage Sickle Cell Disease patients presenting

with vaso-occlusive crises, and do they use validated algorithms and protocols?

It is not within MassHealth's authority, as a Medicaid and CHIP program, to train and prepare emergency service providers. We also do not have the ability to track what validated treatment algorithms they use. However, MassHealth ensures its providers meet all applicable state licensure and certification requirements and that contracted plans maintain credentialing and recredentialing programs consistent with state and federal standards

Key Question 6. How many enrollees with Sickle Cell Disease had 2 or more hospitalizations or emergency department (ED) visits due to a vaso-occlusive episode or pain crisis, and what was their average length of stay for such visits.

Table 9 describes emergency department utilization overall in the SCD population compared to those without SCD and describes ED utilization for vaso-occlusive episodes or pain crisis specifically.

Table 9. Percentages of Medicaid and CHIP Enrollees by Age, with and Without Sickle Cell Disease, With Emergency Room Visits, July 1, 2022 – June 30, 2024

Age range	% of enrollees with SCD with 2 ER visits	% of enrollees with SCD with 3-5 ER visits	% enrollees with SCD with more than 5 ER visits	% of enrollees without SCD with 2 ER visits	% of enrollees without SCD with 3-5 ER visits	% of enrollees without SCD with more than 5 ER visits	% of enrollees with SCD with 2 ER visits for pain crisis or Vaso-Occlusive episode	% of enrollees with SCD with 3-5 ER visits for pain crisis or Vaso-Occlusive episode	% of enrollees with SCD with more than 5 ER visits for pain crisis or Vaso-Occlusive episode
Ages 0-20	2.5%	3.1%	<1.0%	9.14%	7.84%	1.88%	1.24%	1.52%	0.33%
Ages 21-64	1.81%	3.40%	4.18%	6.84%	10.43%	4.70%	1.80%	3.40%	3.69%
Ages 65 or older	0.0%	0.0%	0.0%	6.9%	5.4%	1.3%	0.0%	0.0%	0.0%
Average	**1.6%**	**2.3%**	**1.5%**	**9.2%**	**8.4%**	**2.8%**	**1.0%**	**1.5%**	**1.0%**

Enrollees - Exclude TPL, exclude dual eligible, 24 months continuous enrollment except for enrollees younger than 2 years old.
An ER Visit with a Vaso-Occlusive Episode or Pain Crisis is defined as an ER claim or encounter one of the following codes as the primary, secondary or tertiary diagnosis: D5700, D5701, D5702, D5721, D57211, D57212, D57219, D57411, D57412, D57419, D57811, D57812, D57819

Tables 10 and 11 compare inpatient hospitalizations for those with SCD to those without SCD. It examines both the rate of use and the length of stay. Those with SCD are less likely to have two to five hospital stays than those without SCD, however, among enrollees who have five or more hospital stays, the percentage is higher among those with SCD. Those with SCD also

consistently have shorter hospitalizations than those enrollees without SCD, across all age groups and all categories of number of hospitalizations. These data were not tested for statistical significance.

Table 10. Percentage of MassHealth enrollees by age with and without Sickle Cell Disease with 2 or more hospitalizations, July 1, 2022 - June 30, 2024 *

Age Range	% of enrollees with Sickle Cell Disease with 2 Inpatient Stays	% enrollees with Sickle Cell Disease with 3-5 Inpatient Stays	% enrollees with Sickle Cell Disease with more than 5 Inpatient Stays	% of enrollees without Sickle Cell Disease with 2 Inpatient Stays	% enrollees without Sickle Cell Disease with 3-5 Inpatient Stays	% enrollees with Sickle Cell Disease with more than 5 Inpatient Stays
Ages 0 to 20	**1.37%**	**1.04%**	**1.77%**	**1.09%**	**0.52%**	**0.17%**
Ages 21 to 64	2.39%	2.67%	4.60%	2.30%	1.77%	1.33%
Ages 21 to 64	2.39%	2.67%	4.60%	2.30%	1.77%	1.33%
Ages 65 or older	0.0%	0.0%	0.0%	2.3%	1.8%	0.5%
Average	**1.3%**	**1.1%**	**1.4%**	**1.8%**	**1.2%**	**0.6%**

Enrollees - Exclude TPL, exclude dual eligible, 24 months continuous enrollment except for enrollees younger than 2 years old.
*Age stratification categories were compressed compared to Table 14 due to small cell sizes in these data

Table 11. Average Length of Stays for MassHealth Enrollees by Age with and without Sickle Cell Disease with 2 or More Hospitalizations July 1, 2022 - June 30, 2024

Age Range	Enrollees with Sickle Cell Disease with 2 IP visits Avg LOS	Enrollees with Sickle Cell Disease with 3-5 IP visits Avg LOS	Enrollees with Sickle Cell Disease with more than 5 IP visits Avg LOS	Enrollees without Sickle Cell Disease with 2 IP visits Avg LOS	Enrollees without Sickle Cell Disease with 3-5 IP visits Avg LOS	Enrollees without Sickle Cell Disease with more than 5 IP visits Avg LOS
Ages 0 to 5	4.38	4.00	0	7.14	11.74	26.18
Ages 6 to 12	3.60	4.00	5.44	6.51	10.03	25.63
Ages 13 to 20	6.43	5.75	10.28	7.91	10.77	22.83
Age 21 to 45	6.42	8.11	13.71	5.79	8.67	8.7
Ages 46 to 64	4.87	7.00	4.43	6.86	8.28	8.94
Ages 65 or older	0	0	0	7.78	9.34	15.71
Average	**4.28**	**4.81**	**5.64**	**7.00**	**9.81**	**18.00**

Enrollees - Exclude TPL, exclude dual eligible, 24 months continuous enrollment except for enrollees younger than 2 years old.

Key Question 7. What input was provided to MassHealth from the public and interested parties, including patients with Sickle Cell Disease and experts in Sickle Cell Disease?

A public hearing was held April 25, 2025. It was attended by parents, adults with Sickle Cell Disease (SCD), medical professionals who care for and support SCD patients, advocates, and others. Attendees shared their unique perspectives and provided well-considered comments on the care experiences and challenges that those with SCD encounter. Five themes emerged from this hearing and are summarized below. Some of the issues that were discussed were beyond our ability to impact as a health insurance provider but are included because they provide an

important perspective on how to better serve this population across all state services, not just MassHealth.

1. Need for Greater Research and Advocacy

Greater research is required to identify more effective treatments and to understand the full scope of appropriate care and support services necessary to improve outcomes for SCD patients. Additionally, more advocacy is needed to ensure that solutions discovered through research and current evidence are implemented and available to people with SCD and their families.

Hearing attendees indicated a belief that the prevalence of SCD is underreported. According to advocates present, the number of people with SCD who have co-morbidities is also not accurately reflected in the data. Research into the interplay between SCD and various comorbidities should be undertaken to ensure treatments are appropriately tailored to each patient's situation. Research needed to most effectively serve people with SCD includes an investigation into the effect of SCD on fertility and pregnancy. Furthermore, advocates indicated that research into new treatments for the physiological effects of SCD must be supplemented with research into the mental health needs of people with SCD, their immediate families, and caregivers.

Attendees indicated that the variations in SCD complications and presentations are not clearly understood by those whom a patient with SCD may encounter, even in a healthcare setting. Comprehensive patient care should include education for people with SCD to understand how it will present and what to expect throughout the developmental stages of their lives from childhood, through adolescence, and transitioning into adulthood. Informed patients are better able to self-manage their conditions outside of clinical settings and advocate for themselves when care moves to a healthcare environment.

2. Need for Expansion of Traditional and Integrative Treatments

As MassHealth continues to monitor the emergence of new treatments in the clinical pipeline, attendees indicated a need for facilitated access to and expanded coverage of traditional treatments as well as greater coverage of integrative health options.

Traditional treatments: Hearing attendees expressed a desire to see MassHealth extend coverage for new pharmacotherapies and gene therapy options as their efficacy is proven. Reproductive health services and genetic counseling, though not treatments for SCD itself, were included as services to be considered for coverage as access barriers are an equity issue. For procedures and screenings, such as hip-replacement or bone density analysis, attendees indicated that age requirements for coverage should be re-evaluated for MassHealth enrollees with SCD as age-related physiological effects are escalated in this population.

Integrative Health: Attendees with SCD cited non-traditional treatments like acupuncture, hypnotherapy, massage, prescriptive nutrition and guided exercise as being beneficial. Because these services would contribute to better condition management, coverage for these interventions may reduce reliance on more expensive clinical treatments. Some of these

services, such as acupuncture for pain, are already available to MassHealth enrollees, indicating that there is room to improve on uptake of these services. Multiple attendees indicated that, in addition to condition specific physiological treatments, mental health services should be available as a component of holistic SCD management.

3. Burden of Limited Access to Adequate Treatment

As outlined in the 2023 legislative report, SCD is primarily a disease that affects Black and brown people (Massachusetts Executive Office of Health and Human Services, Office of Medicaid 2023). Patients with SCD have access to fewer health resources and experience worse health outcomes compared to other comparable diseases. Because SCD is a complex condition, affecting multiple organ systems, optimal outcomes require coordinated care between multiple specialists. Lack of coordinated care, and the inability to access one or more specialists negatively affects quality of life and undermines the effectiveness of care regimens.

Participants reported that within Massachusetts, SCD expertise is concentrated in the greater Boston area. This hinders accessibility for patients who live outside of the area and those who have transportation barriers, creating a health equity issue. Continued effort must be put forward to assess these barriers and other social risk factors that contribute to the disparities associated with SCD. Identifying and implementing best practices for addressing the disparities is imperative.

4. Need for Culturally Sensitive Care

By definition, effective, compassionate care must include cultural competency and respect for the individual. People with SCD cannot consider care adequate if they do not feel respected. Attendees recounted incidents where healthcare providers, including physicians, nurses and pharmacists, ignored or diminished the patients' reports of pain. Mistrust on the part of healthcare providers due to a lack of understanding can delay appropriate care and prolong the suffering of people with SCD. For people with SCD, who are primarily Black and brown, access to adequate care requires appropriate training of medical staff to broaden awareness of how SCD affects these populations.

5. Need for Greater Support in Scholastic Settings

The challenges that children with SCD experience are compounded by insufficient support within educational settings.

Understanding the challenges that students with SCD experience: Educators and school staff must be trained to recognize and appropriately support students in SCD crisis. Lack of awareness may cause delays in notifying parents and helping students receive appropriate care. Additionally, staff must be sensitive to the feelings of the student who may be uncomfortable or self-conscious about experiencing a medical crisis within a school setting. Attendees indicated that faculty and staff of school systems within Massachusetts should receive appropriate training to improve awareness of the challenges experienced by pupils with SCD.

Provision of specialized support to ensure equitable treatment and access to education: Students who miss school due to pain crisis or hospitalization may fall behind their peers if they are not provided with resources to aid them in mastery of missed lesson content. Students may have difficulty acquiring new knowledge if it is built upon a foundation that falls within the students' learning gaps. Absenteeism due to SCD may be reported as truancy, creating unnecessary stress for the student and their family. Attendees suggested that support protocols and supplemental educational plans should be adopted by school systems to ensure that students with SCD are able to perform at their optimal academic level despite interruptions that health-related events necessitate.

Key Question 8. Are there any recommendations for improvements in the delivery of healthcare services to enrollees with Sickle Cell Disease?

The following recommendations were developed through consideration of available data, as reflected in this report, and needs identified or emphasized through the public hearing.

Recommendation 1: MassHealth should review its Sickle Cell Disease (SCD) provider networks to ensure enrollees have access to clinicians treating SCD. MassHealth should work with its plans and providers to identify and address any SCD provider gaps that exist for patients.

Recommendation 2: MassHealth should partner with plans and providers to support the dissemination of resources and/or ongoing education opportunities for clinicians who care for enrollees with SCD.

Recommendation 3: MassHealth should provide relevant data and informational testimony for future legislative efforts that aim to support SCD enrollees' access to care.

Recommendation 4: MassHealth should continue to support high-quality, robust SCD care through its coverage policies, contracts with plans and providers, and its quality programs.

Recommendation 5: MassHealth should continue to require its plans to engage providers in training and other programming to bolster culturally sensitive care.

Key Question 9. Are there any recommendations for adding or facilitating acess to additional medications, treatments or services for enrollees with Sickle Cell Disease?

MassHealth provides a broad spectrum of services applicable to caring for members with Sickle Cell disease. MassHealth should continue to educate plans, providers, and members on the full range of available services to ensure members with SCD receive needed care.

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Appendices

Appendix I. ICD-10 Codes for Sickle Cell Disease (SCD) used in this report

ICD-10 Code	ICD-10 Description
D57.00	Hb-SS disease with crisis, unspecified
D57.01	Hb-SS disease with acute chest syndrome
D57.02	Hb-SS disease with splenic sequestration
D57.03	Hb-SS disease with cerebral vascular involvement
D57.04	Hb-SS disease with dactylitis
D57.09	Hb-SS disease with crisis with other specified complication
D57.1	Sickle cell disease w/o crisis
D57.20	Sickle-cell/Hb-C disease without crisis
D57.211	Sickle-cell/Hb-C disease with acute chest syndrome
D57.212	Sickle-cell/Hb-C disease with splenic sequestration
D57.214	Sickle-cell/Hb-C disease with dactylitis
D57.218	Sickle-cell/Hb-C disease with other specified complication
D57.219	Sickle-cell/Hb-C disease with crisis, unspecified
D57.40	Sickle-cell thalassemia without crisis
D57.411	Sickle-cell thalassemia with acute chest syndrome
D57.412	Sickle-cell thalassemia with splenic sequestration
D57.413	Sickle-cell thalassemia, unspecified with cerebral vascular involvement
D57.414	Sickle-cell thalassemia, unspecified, with dactylitis
D57.418	Sickle-cell thalassemia, unspecified, with crisis with other specified complication
D57.419	Sickle-cell thalassemia with crisis, unspecified
D57.42	Sickle-cell thalassemia beta zero without crisis
D57.431	Sickle-cell thalassemia beta zero with acute chest syndrome
D57.432	Sickle-cell thalassemia beta zero with splenic sequestration
D57.433	Sickle-cell thalassemia beta zero with cerebral vascular involvement
D57.434	Sickle-cell thalassemia beta zero with dactylitis
D57.438	Sickle-cell thalassemia beta zero with crisis with other specified complication
D57.439	Sickle-cell thalassemia beta zero with crisis, unspecified
D57.44	Sickle-cell thalassemia beta plus without crisis
D57.451	Sickle-cell thalassemia beta plus with acute chest syndrome
D57.452	Sickle-cell thalassemia beta plus with splenic sequestration
D57.453	Sickle-cell thalassemia beta plus with cerebral vascular involvement
D57.454	Sickle-cell thalassemia beta plus with dactylitis
D57.458	Sickle-cell thalassemia beta plus with other specified complication
D57.459	Sickle-cell thalassemia beta plus with crisis, unspecified
D57.80	Other sickle-cell disorders without crisis
D57.811	Other sickle-cell disorders with acute chest syndrome
D57.812	Other sickle-cell disorders with splenic sequestration

ICD-10 Code	ICD-10 Description
D57.813	Other sickle-cell disorders with cerebral vascular involvement
D57.814	Other sickle-cell disorders with dactylitis
D57.818	Other sickle-cell disorders with crisis with other specified complication
D57.819	Other sickle-cell disorders with crisis, unspecified

Appendix II. GSN, J-code, and CPT Codes for SCD Agents used in this report

Appendix II Table 1 Hydroxyurea products

GSN Code	Description
040162	Droxia® (hydroxyurea) 200 mg capsule
040163	Droxia® (hydroxyurea) 300 mg capsule
040164	Droxia® (hydroxyurea) 400 mg capsule
008775	Hydrea® (hydroxyurea) 500 mg capsule
067584	Siklos® (hydroxyurea) 100 mg tablet
078316	Siklos® (hydroxyurea) 1,000 mg tablet
060202	Hydroxyurea powder

Appendix II Table 2 Oxbryta Products

GSN Code	Description
084244	Oxbryta® (voxelotor) 300 mg tablet
082925	Oxbryta® (voxelotor) 300 mg tablet for suspension
080506	Oxbryta® (voxelotor) 500 mg tablet
Endari	
078050	Endari® (L-glutamine) 5 gm powder packet
Adakveo GSN Code	
080477	Adakveo® (crizanlizumab-tmca)
Adakveo J-Codes	
J0791	Adakveo® (crizanlizumab-tmca)
Casgevy GSN Code	
085589	Casgevy® (exagamglogene autotemcel) vial
Casgevy J-Code	
J3392 (Unspecified codes: J3490, J3590, J9999)	Casgevy® (exagamglogene autotemcel) vial
Lyfgenia GSN Code	
085590	Lyfgenia® (lovotibeglogene autotemcel)
Lyfgenia J-Codes	
J3394 (Unspecified codes: J3490, J3590, J9999)	Lyfgenia® (lovotibeglogene autotemcel)

Appendix II Table 3 Pneumococcal Vaccines

CPT Codes	Description
90670	Prevnar 13® (pneumococcal 13-valent conjugate vaccine)
90671	Vaxneuvance® (pneumococcal 15-valent conjugate vaccine crm197 protein adsorbed injection, suspension)
90677	Prevnar 20® (pneumococcal 20-valent conjugate vaccine)