2030: SCD Pre-Infusion

SCD Pre-Infusion Data

The Sickle Cell Disease (SCD) Pre-Infusion Data Form (Form 2030) is one of the Comprehensive Report Forms. This form captures SCD-specific pre-infusion data such as: disease classification at diagnosis, transfusion status prior to the start of the preparative regimen, organ assessments prior to the start of the preparative regimen, and the indication for transplant.
This form must be completed for all recipients randomized to the Comprehensive Report Form (CRF) track whose primary disease is reported on the Pre-TED Disease Classification Form (Form 2402) as “Sickle Cell Disease (SCD).”

Links to Sections of the Form

Manual Updates:
Sections of the Forms Instruction Manual are frequently updated. The most recent updates to the manual can be found below. For additional information, select the manual section and review the updated text.

If you need to reference the historical Manual Change History for this form, please click here or reference the retired manual section on the Retired Forms Manuals webpage.

Date	Manual Section	Add/ Remove/ Modify	Description
10/	2030:	Add	Added the following guidance on answering questions 17 and 18: **Questions 17**

23/ 2020	SCD Pre-Infusion		**and 18 are currently disabled and should not be completed on this form. These data are already collected on the Baseline (2000) Form and do not need to be reported again.**
7/24/ 2020	2030: SCD Pre-Infusion	Add	Version 1 of the 2030: Sickle Cell Disease (SCD) Pre-Infusion Data section of the Forms Instruction Manual released. Version 1 corresponds to revision 3 of the Form 2030.

Last modified: Nov 11, 2020

Q1: Subsequent Transplant or Cellular Therapy

Question 1: Is this the report of a second or subsequent infusion?

Report No and go to question 2 in any of the following scenarios:

- This is the first infusion reported to the CIBMTR; or
- This is a second or subsequent infusion for a different disease (i.e., the patient was previously transplanted for a disease other than Sickle Cell Disease); or
- This is a second or subsequent infusion for the same disease subtype and this baseline disease insert was not completed for the previous transplant (i.e., the patient was on the TED track for the prior infusion, prior infusion was autologous with no consent, etc.).

Report **Yes** and go to question 6 if this is a subsequent infusion for the same disease and the baseline SCD disease insert was completed previously.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q2-5: Disease Classification at Diagnosis

Note: When reporting data on the Sickle Cell Disease (SCD) Pre-Infusion Data Form (Form 2030 – Revision 3), report all findings at any time prior to the start of the preparative regimen, unless otherwise specified. If no preparative regimen was given, report all findings at any time prior to infusion (day 0).

Question 2: Was sickle cell disease diagnosed at birth? (i.e., newborn screening)

The most common method of diagnosis for Sickle Cell Disease (SCD) is a blood screen which looks for the defective hemoglobin molecule in the circulating blood. In the United States, this blood test is available as part of routine newborn screening. Infants are often diagnosed at birth or *in utero*.

Report **Yes** if the recipient was diagnosed with Sickle Cell Disease (SCD) at birth (or *in utero*). If the recipient was not diagnosed as birth, report **No** and provide the date of diagnosis in question 3. If it is unknown whether the recipient was diagnosed at birth, report **Unknown**. This option should be used sparingly and only when no information exists regarding SCD screening as an infant.

Question 3: Date of diagnosis

Report the date of diagnosis of SCD. Enter the date the sample was collected for examination. If the diagnosis was determined at an outside facility and no documentation of the laboratory assessment is available, the dictated date of diagnosis within a physician note may be reported. Do not report the date symptoms first appeared.

If the exact pathological diagnosis date is not known, use the process described in General Instructions, Guidelines for Completing Forms.

Questions 4 – 5: What is the recipient's sickle cell disease genotype?

Genetics play a critical role in the development of sickle cell disorders. Clinical symptoms vary depending on which gene variants are inherited. Accurate identification of the recipient's sickle genotype may help guide clinical management of symptoms.

Specify the recipient's sickle cell disease genotype. If the recipient exhibits a sickle cell genotype that is not listed, select **Other genotype** and specify the sickle cell genotype in question 5.

See *Table 1. Sickle Cell Genotypes* below for a description and common characteristics of each genetic variant.

Table 1. Sickle Cell Genotypes

Genotype	Description

Hb SC	One sickle gene is inherited from one parent and one abnormal hemoglobin-producing “C” gene is inherited from the other parent. Typically characterized by mild symptoms but increased likelihood of proliferative sickle retinopathy has been observed.
Hb SD	One sickle gene is inherited from one parent and one abnormal hemoglobin-producing “D” gene is inherited from the other parent. The severity of symptoms varies for recipients with this genotype.
Hb SO Arab	A rare, compound, heterozygous hemoglobinopathy characterized by inheritance of one sickle gene from one parent and one abnormal hemoglobin-producing “O” gene inherited from the other parent. Severity is similar to those of homozygous SCD.
Hb SS	Most common type of sickle cell disease and is often called homozygous sickle cell anemia. One sickle gene is inherited from each parent. Often characterized by higher prevalence of hemolysis and lower hemoglobin values compared to Hb SC or beta+ thalassemia. Incidence of leg ulcers and episodes of priapism are increased. Regarded as a severe form of SCD.
Hb S beta^0 thalassemia	A more severe form of Sickle Cell Disease (SCD) characterized by crescent-shaped red blood cells (RBC) (e.g., sickle cells) that break down prematurely as well as populations of smaller RBCs, simultaneously.
Hb S beta[+] thalassemia	A mild form of Sickle Cell Disease (SCD) characterized by crescent-shaped red blood cells (RBC) (e.g., sickle cells) that break down prematurely as well as populations of smaller RBCs, simultaneously.
Hb S delta beta^0 thalassemia	A rare, homozygous hemoglobinopathy characterized by decreased production of the delta- and beta-globin chains. There is a compensatory increase in the production and expression of Hb F in affected individuals.

Note: For question 6-116, report any findings at any time prior to the start of the preparative regimen / infusion unless otherwise specified. If more than one assessment was performed prior to the start of the preparative regimen / infusion, report the most recent assessment, unless otherwise specified.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q6-18: Transfusion Therapy

Question 6: Were any red blood cell (RBC) transfusions administered?

Red blood cell (RBC) transfusions are often given as supportive care to lower hemoglobin S for recipients diagnosed with Sickle Cell Disease (SCD). If the recipient received any RBC transfusions between diagnosis and the start of the preparative regimen / infusion, select **Yes**. If the recipient did not receive any RBC transfusions or no information is available to determine if the recipient received RBC transfusions, report **No** and go to question 17.

Question 7: Number of RBC transfusion events within the last 12 months

Transfusions may be referred to as “simple” or “exchange” transfusions. A simple transfusion refers to a direct infusion of a blood product. An exchange transfusion refers to the slow removal and replacement of the recipient’s blood with that of a healthy donor’s blood. A transfusion event consists of one or more RBC unit(s) given in a day.

Indicate the total number of RBC transfusion events the recipient received within 12 months prior to the start of the preparative regimen / infusion to prevent sickle-related vaso-occlusive events.

Example: The progress notes state a recipient was transfused with one RBC unit for each month, for six months. The number of transfusions increased, and the recipient receives two RBC units on the same day, each month, for the following six months prior to the start of the preparative regimen. The total number of RBC transfusion events within the last 12 months would be reported as “12.”

Question 8: Date of last transfusion administered

Report the date of the *most recent* RBC transfusion administered prior to the start of the preparative regimen / infusion.
If the last administration date is partially known (i.e., the recipient received their last RBC transfusion in mid-July 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Question 9: Was a transfusion administered to PREVENT sickle cell related events? (includes simple or exchange transfusions)

Transfusions administered routinely to offset the effects of sickle cell-related events are often called “chronic transfusions” within progress notes. In the context of reporting, “chronic transfusions” are defined as eight or more transfusion events per year, for at least a year, or a lifetime cumulation of ≥ 20 transfusion events between diagnosis and referral for transplant.

If any of the red blood cell transfusions were administered to prevent sickle cell related events, report **Yes**.

Report **No** in the following scenarios:

- If the recipient did not receive transfusions to prevent sickle cell related events.
- There is no information available to determine if the recipient received transfusions to prevent sickle cell-related events.
- If the recipient is receiving transfusion therapy for reasons other than to prevent sickle cell-related events.

Questions 10 – 11: Date transfusion started

Indicate if the date transfusion(s) administered to prevent sickle cell related events began is **Known** or **Unknown**. If **Known**, enter the date when the first transfusion began in question 11. If transfusions were given over multiple days, report the first date of administration where the intent of transfusion was to offset or prevent the effects of sickle cell-related events. The reported start date should align with the recipient's sickle cell-related event for which the transfusion was administered and may not be the same transfusion event reported in question 8. If the reported transfusion start date is an estimated date, also select **Date estimated**.

If the therapy start date is not known, report **Unknown** and go to question 12.

If the start date is partially known (i.e., the recipient started treatment in mid-July 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Questions 12 – 13: Date therapy stopped

Indicate if the transfusion therapy stop date is **Known** or **Unknown**. If the therapy stop date is **Known**, enter the date when the transfusion(s) to prevent sickle cell related events stopped in question 13. If the reported transfusion start date is an estimated date, also select **Date estimated**.

Report Unknown if the stop date is not known and go to question 14.

If the recipient is still receiving transfusions to prevent sickle cell related events at the start of the preparative regimen / infusion, report **Not applicable** and go to question 14.

If the stop date is partially known (i.e., the recipient stopped treatment in mid-September 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Question 14: Are the RBC units used for transfusion of an extended phenotype match (D, C, c, E, e, K)? (includes partial extended phenotype matches)

Extended phenotype testing may be performed on RBC units prior to transfusion to ensure donor and recipient matches are confirmed beyond the standard ABO compatibility matching to decrease the risk of alloimmunization. This information is typically found within the blood bank section of the medical record.

Report **Yes** if the RBC unit(s) used for transfusion are of an extended phenotype match (particularly D, C, c, E, e, or K). If the RBC unit(s) used for transfusion were not matched for extended phenotype D, C, c, E, e, or K or it is unknown if matched, report **No**.

Questions 15 – 16: Are RBC alloantibodies present?

The presence of RBC alloantibodies may cause serologic incompatibility and make the selection of RBC units for future transfusions difficult. RBC alloantibodies are typically present once alloimmunization has occurred.

If RBC alloantibodies are present prior to the start of the preparative regimen / infusion, report **Yes** and specify the number of alloantibodies identified in question 16. If testing for RBC alloantibodies were performed multiple times prior to the start of the preparative regimen / infusion, report the most recent assessment.

If RBC alloantibodies were not present prior to the start of the preparative regimen / infusion, report **No** and go to question 17.

Report **Unknown** if testing was not performed or it is not known if alloantibodies were present and go to question 17.

> ! Questions 17 and 18 are currently disabled and should not be completed on this form. These data are already collected on the Baseline (2000) Form and do not need to be reported again.

Questions 17 – 18: Does the recipient have donor-specific antibodies present to the donor chosen for transplant? (Mean fluorescence intensity (MFI) > 1000 for HLA-A, HLA-B, and DRB1; and MFI > 2000 for HLA-C, DQB1, and DPB1 or positive virtual cross match)

Mean fluorescence intensity (MFI) is often used to determine the mean intensity and level of antibody expression within a sample. Donor-specific antibodies may be quantified through fluorescing techniques such as flow cytometry. This information may be found on an HLA report or within the blood bank section of the medical record.

Report **Yes** if the MFI > 1000 for HLA-A, HLA-B, and DRB1 or MFI > 2000 for HLA-C, DQB1, and DPB1 at any time prior to the start of the preparative regimen / infusion. If **Yes**, indicate if measures were taken to lower the MFI for the presence of donor antibodies prior to the start of the preparative regimen / infusion.

If testing was performed multiple times prior the start of the preparative regimen / infusion, report the most recent assessment.

Report **No** if the MFI ≤ 1000 for HLA-A, HLA-B, and DRB1 or MFI ≤ 2000 for HLA-C, DQB1, and DPB1 at any time prior to the start of the preparative regimen / infusion.

If testing was not performed to determine presence or absence of donor-specific antibodies, indicate **Not tested**. The **Unknown** option should be used sparingly and only when no information is available to determine if donor-specific antibody testing was conducted at any time between diagnosis and the start of the preparative regimen / infusion.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q19-21: Iron Therapy

Question 19: Was iron chelation therapy received at any time?

Iron chelation therapy is used to prevent or reduce iron overload. Examples include Deferoxamine (Desferal) and Deferasirox (Jadenu, Exjade).

Select **Yes** if iron chelation therapy was performed at any time prior to the start of the start of the preparative regimen / infusion. If iron chelation therapy was not given or it is unknown whether iron chelation therapy was given, select **No** or **Unknown** and go to question 22.

Questions 20 – 21: Specify therapy (check all that apply)

Specify the iron chelation therapy(ies) administered to reduce iron overload. Select all that apply. If the administered agent is not listed, select **Other** and specify the agent in question 21.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q22-26: Pulmonary Assessments

Questions 22 – 23: Were pulmonary function tests (PFT) performed? (If PFT tests were conducted we ask that you attach the most recent report)

Indicate if pulmonary function tests (PFTs) were performed prior to the start of the preparative regimen / infusion. If pulmonary function tests were performed, report **Yes** and specify if the PFT report is attached. If multiple PFTs were performed, attach the most recent report. Attaching PFT reports will prevent future requests to submit additional data for research studies.

If pulmonary function tests were not performed between diagnosis and the start of the preparative regimen / infusion, select **No** and go to question 24.

For instructions on how to attach documents in FormsNet3[SM], refer to the Training Guide.

Question 24: For children unable to perform a PFT, was oxygen saturation on room air > 95%?

Indicate if oxygen saturation on room air was > 95%. If oxygen saturation is > 95%, report **Yes**. If the oxygen saturation on room air was ≤ 95%, report **No**. If oxygen saturation was assessed multiple times, report the most recent assessment.

If oxygen saturation was not assessed, report **Not tested**.

This question is only applicable for children ≤ 5 years of age.

Questions 25 – 26: Was a 6-minute walk test performed?

A 6-minute walk test is used to assess total distance walked within 6 minutes to determine aerobic capacity and endurance. Indicate if a 6-minute walk test was performed at any time between diagnosis and the start of the preparative regimen / infusion. If **Yes**, report the total distance walked and specify the unit of measure.

If a 6-minute walk test was not performed, report **No**. If the recipient is unable to walk or cannot perform the 6-minute walk test due to their current clinical status, report **No**.

If multiple walk tests were performed prior to the start of the preparative regimen / infusion, report the results of the most recent assessment.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q27-37: Cardiovascular Assessments

Question 27: Was an echocardiogram performed?

Indicate if an echocardiogram was performed at any time between diagnosis and the start of the preparative regimen / infusion. If an echocardiogram was performed, report **Yes**. If multiple echocardiograms were performed, complete questions 28 – 33 using the most recent report.

If an echocardiogram was not performed, report **No** and go to question 34.

The **Unknown** option should be selected sparingly and only when no information is available to determine if an echocardiogram was performed at any time prior to the start of the preparative regimen / infusion.

See Figure 1 below for an example of an echocardiogram report.

Figure 1: Echogcardiogram

M-MODE					
LV Diastolic Diameter	23.8 mm	37-56	Posterior wall	4.3 mm	8-12
LV Systolic Diameter	13.7 mm		LV_Mass	16.7 g	
LV Ejection Fraction Teich	76 %		Aortic Sinuses	10.6 mm	=<37
Interventricular septum	3.9 mm	8-12	LA Systolic Diameter	16.4 mm	=<40
DOPPLER					
AV Peak Velocity	114 cm/s		PV Peak Velocity	99.1 cm/s	
AV Peak Gradient	5.2 mmHg		PV Peak Gradient	3.9 mmHg	
LVOT Peak Velocity	108 cm/s				

LV: There is normal situs. Normal LV size and systolic function. The heart is displaced inferiorly but structurally normal. The ventricular septum appears intact and there is no shunting noted. The LVEDD normal range is 2.11 - 2.92 Z is -0.64. IVS normal range is 0.36 - 0.63 Z is -1.56. PW normal range is 0.35 - 0.58 Z is -0.60.

RV: Normal RV size and systolic function.

Atria: The atria are of normal size. The atrial septum appears intact and there is no shunting noted.

AV: The aortic valve is tricuspid and normal.

MV: Structurally normal mitral valve.

TV&PV: The tricuspid valve is normal. There is trace tricuspid regurgitation. The pulmonary valve is normal with normal doppler flow.

Aorta: Normal sized aortic sinuses and proximal ascending aorta. The arch, and descending aorta are normal. Th AoR normal range is 0.93 - 1.43 Z is -1.07

Peri: No pericardial effusion.

IVC: Normal

Questions 28 – 29: Was tricuspid regurgitant jet velocity (TRJV) measured?

Tricuspid regurgitant jet velocity (TRJV) measurements are used in determining the pulmonary artery pressure for recipients with sickle cell and other hemolytic disorders. An elevated TRJV is an indication of pulmonary hypertension, a condition common in adults with hemolytic diseases. TRJV is typically documented in the echocardiogram report.

Report **Yes** if TRJV was measured at any time prior to the start of the preparative regimen / infusion and provide the TRJV value as documented on the echo report. If the TRJV was measured multiple times prior to the start of the preparative regimen / infusion, report the most recent value. Report **No** if TRJV was not assessed or is not documented on the echo report.

Questions 30 – 32: Was left ventricular ejection fraction (LVEF) or left ventricular shortening fraction reported?

The left ventricular ejection fraction (LVEF) is a percentage that represents the volume of blood pumped from the left ventricle into the aorta (also known as stroke volume) compared to the volume of blood in the

ventricle just prior to the heart contraction (also known as end diastolic volume). The left ventricular shortening fraction is the percentage change in cavity dimensions of the left ventricle with systolic contraction.

Report **Yes** if either LVEF or left ventricular shortening fraction was assessed at any time prior to start of the preparative regimen / infusion and provide the percentage(s). If the LVEF and left ventricular shortening fraction were assessed, report the results of both. If the LVEF or left ventricular shortening fraction were assessed multiple times prior to the start of the preparative regimen / infusion, report the most recent value(s).

Report **No** if the LVEF and left ventricular shortening fraction were not assessed.

Question 33: Is a copy of the echocardiogram report attached?

Indicate whether the echocardiogram report is attached to this form. For instructions on how to attach documents in FormsNet3SM, refer to the Training Guide.

Questions 34 – 35: Was brain natriuretic peptide (BNP) assessed?

Brain natriuretic peptide (BNP) is a hormone secreted by cardiac ventricle cells in response to increased ventricular blood volume. BNP is typically measured using various immunoassay techniques. Confirm with the attending physician on where to locate immunoassay results measuring BNP, if available.

Indicate if the BNP was assessed at any time between diagnosis and the start of the preparative regimen. If **Yes**, report the value as documented on the laboratory report (in pg / mL). If BNP was assessed multiple times, report the results of the most recent test. If BNP was not assessed or if no information is available to determine if BNP was tested, report **No** or **Unknown**, respectively and go to question 36.

Questions 36 – 37: Is there evidence of pulmonary hypertension?

Pulmonary hypertension (PH) refers to elevated pulmonary arterial pressure and is diagnosed either by an echocardiogram or right heart catherization. PH can be due to a primary elevation of pressure in the pulmonary arterial system alone (pulmonary arterial hypertension), or secondary to elevations of pressure in the pulmonary venous and pulmonary capillary systems (pulmonary venous hypertension; post-capillary PH).

Indicate **Yes** if the recipient had evidence of PH at any time between diagnosis and the start of the preparative regimen and indicate which method was used to diagnose PH. Report **No** if the recipient did not have evidence of PH at any time between diagnosis and the start of the preparative regimen.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q38-46: Hepatic Assessments

Question 38: Was a liver MRI conducted?

Indicate if a liver MRI was conducted at any time between diagnosis and the start of the preparative regimen / infusion. If a liver MRI was performed, report **Yes**. If multiple liver MRIs were performed, report the most recent results. If a liver MRI was not conducted or if no information is available to determine if a liver MRI was performed, report **No** or **Unknown**, respectively and go to question 41.

Questions 39 – 40: What was the liver iron content (LIC)?

Transfusions for hemolytic diseases such as Sickle Cell Disease (SCD), can often lead to iron build up or accumulation in the liver and other target organs. Liver iron content (LIC) is commonly used to measure total iron storage. Common methods of assessment include, but are not limited to, liver biopsy, T2 MRI, and FerriScan.

If liver iron content (LIC) was measured by the liver MRI reported above, report **Known** and provide the liver iron content value and unit of measure as documented on the MRI. If LIC testing was not performed or no information is available to determine if LIC testing was performed, report **Unknown** and go to question 41.

LIC results should be reported in mg Fe / g liver dry weight, g Fe / kg liver dry weight, or µm Fe / g liver dry weight. If laboratory reports at your center provides LIC results in any other units of measure, ensure appropriate conversions are conducted.

Questions 41 – 42: Was a liver biopsy performed?

Evaluation of liver tissue may be necessary to determine the extent of the recipient's disease. Indicate if a liver biopsy was performed at any time between diagnosis and the start of the preparative regimen / infusion. If a liver biopsy was performed, report **Yes** and provide the date of the most recent liver biopsy. This date should reflect the date the sample was collected for analysis. If a liver biopsy was not performed or if no information is available to determine if a liver biopsy was performed, report **No** or **Unknown** and go to question 47.

> **Note: Hepatic Assessments**
> Questions 43 – 46 should be answered based on the same liver biopsy reported in question 42.

Questions 43 – 44: Was there evidence of fibrosis?

Indicate if there was evidence of fibrosis from the liver biopsy reported above. If **Yes**, indicate the type of fibrosis.

- Bridging fibrosis: Bands of fibrous tissue and collagen which span portal spaces and / or centrilobular spaces creating a "bridge-like" appearance

- Periportal fibrosis: Fibrous expansion of portal fields with fibrosis extending along the terminal portal veins.

Report **No** in the following scenarios:

- There was no evidence of fibrosis from the reported liver biopsy
- Fibrosis was identified but the type was not bridging fibrosis or periportal fibrosis.

If documentation is unclear if fibrosis was present or the type of fibrosis identified, seek physician clarification.

Question 45: Was there evidence of cirrhosis?

Indicate if there was evidence of cirrhosis from the liver biopsy reported above. If cirrhosis was identified, report **Yes**. If cirrhosis was not identified or no information is available to determine if cirrhosis was present, report **No**.

Question 46: Is a copy of the biopsy report attached?

Indicate whether the liver biopsy report is attached to this form. For instructions on how to attach documents in FormsNet3[SM], refer to the Training Guide.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q47-51: Renal Assessments

Questions 47 – 48: Urine albumin

Indicate whether urine albumin was measured prior to the start of the preparative regimen / infusion. If measured, select **Known** and report the laboratory value and unit of measure documented on the laboratory report. If urine albumin was assessed on multiple dates, report the most recent results. If urine albumin was not measured or if no information is available to determine if urine albumin was measured, report **Unknown** and go to question 49.

If the urine albumin is < 0.1 mg / L, report the urine albumin value as “0 mg / L.”

Question 49: Serum creatinine

Indicate the most recent serum creatinine value prior to the start of the preparative regimen / infusion. Report the laboratory value and unit of measure documented on the laboratory report.

> **Glomerular Filtration Rate (GFR):**
> Questions 50 – 51 are only enabled for adult recipients (> 18 years of age). The GFR is collected for pediatric recipients (≤ 18 years of age) on the Pre-TED (2400) Form.

Questions 50 – 51: Glomerular Filtration Rate (GFR)

The glomerular filtration rate (GFR) estimates how much blood passes through the glomeruli each minute and is used to check how well the kidneys are working. Indicate whether the GFR was measured prior to the start of the preparative regimen / infusion. If measured, select **Known** and report the laboratory value and unit of measure documented on the laboratory report. If testing was performed multiple times, report the most recent laboratory value obtained. If the GFR was not measured or if no information is available to determine if the GFR was assessed, report **Unknown** and go to question 52.

GFR may be reported to the CIBMTR as “actual” or “calculated.” If your center’s laboratory does not calculate the actual GFR value, use the Cockcroft-Gault equation (see equation below) to determine the calculated value.

Cockcroft-Gault Equation

GFR = ((140-age)x Wt)/(72 x Cr)

- GFR_cg = Glomerular Filtration Rate (Cockcroft) (mL / min)
- Age = Patient Age (years)
- Sex = Gender (Male)
    - If female, multiply result by 0.85
- Wt = Body Weight (kg)
- Cr = Creatinine (S, mg / dL)

If the laboratory report indicates the GFR as a range, report the average. Example, if the laboratory report indicates GFR is 80 – 120, report “100.”

For values expressed as g “> X,” report the value as “X+1.” Example, if the laboratory report indicates the GFR is greater than 120, report “121.”

If the laboratory report indicates the GFR “< X,” report the value as “X-1.” Example, if f the GFR is reported as < 80, report “79.”

Section Updates:

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Last modified: Dec 22, 2020

Q52-56: Splenic Assessments

Question 52: Was splenic function assessed?

Evaluation of splenic tissue may be necessary to determine the extent of the recipient's disease. Splenic assessments include the following:

- Complete RBC: Also called an erythrocyte count, this assessment is used to determine how many red blood cells are present. A test included in a CBC.
- Pitted RBC score: As red blood cells (RBC) age, membrane vacuoles ("pits") occur. Pitted RBCs may be listed on laboratory reports as a "PIT count."
- Splenic scan: Radionuclide spleen scans (liver-spleen scans) are nuclear scan utilizing a radioactive tracer substance that is administered intravenously. The tracer collects in large amounts and shows as bright spots on imaging results. One of the most common methods used is single photon emission computed tomography (SPECT / CT).

Indicate **Yes** if splenic function was assessed by a complete RBC, pitted RBC score, or splenic scan at any time between diagnosis and the start of the preparative regimen / infusion.

If splenic function was not assessed or no information is available to determine if splenic function was assessed at any time between diagnosis and the start of the preparative regimen / infusion, select **No** or **Unknown**, respectively and go to question 57. **Unknown** should be used sparingly.

Report **Not applicable** if the recipient had a prior splenectomy or was born without a spleen (congenital asplenia) and go to question 57.

Questions 53 – 56: Select which splenic tests was completed

Indicate which splenic test (completed RBC, pitted RBC score, and/or splenic scan) was completed.

If the assessment was performed multiple times prior to the start of the preparative regimen / infusion, report the most recent results.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q57-61: Acute Chest Syndrome

Question 57: Has acute chest syndrome (ACS) occurred in the last two years?

Acute chest syndrome (ACS) is a term used to identify symptoms of chest pain, cough, fever, decreased oxygen (hypoxia), and lung infiltrates. Due to the sickling nature of red blood cells as a result of sickle cell disease, ACS may result in pulmonary infarction / emboli or viral / bacterial pneumonia. Diagnosis of ACS should be made based on clinical judgement.

Indicate if the recipient was clinically diagnosed with ACS in the last two years. If diagnosed, report **Yes**. If not clinically diagnosed or was diagnosed more than two years prior to the start of the preparative regimen / infusion, report **No** and go to question 62. If no information is available to determine if ACS was clinically diagnosed, report **Unknown** and go to question 62.

Questions 58 – 59: Total number of episodes within the last two years

Indicate if the total number of ACS episodes in the last two years is **Known** or **Unknown**. If **Known**, specify the number of episodes. If the number of ACS episodes are not known, select **Unknown**.

In this context, an “episode” is defined as having clinical symptoms requiring intervention (i.e., antibiotics, steroids, etc.) followed by resolution of symptoms and discontinuation of intervention. This should not be interpreted as the number of days the recipient was receiving treatment or had active symptoms. An episode may also be referred to as an “event.”

Question 60: Were red blood cell transfusions required for treatment of ACS in the last two years? (report any simple or exchanged transfusions prior to infusion)

Report **Yes** if RBC transfusion support was required to offset the clinical symptoms of ACS for any episode(s) within the last two years. This includes both simple and exchange transfusions. If RBC transfusions were not required in the last two years, report **No**. If no information is available to determine if RBC transfusion were required, report **Unknown**.

Question 61: Was intubation / mechanical ventilation required for treatment of ACS in the last two years?

A history of intubation and/or mechanical ventilation may impact the recipient’s pulmonary function post-HCT.

If the recipient was intubated and/or placed on mechanical ventilation due to ACS within the last two years, report **Yes**. If the recipient was not intubated and/or placed on mechanical ventilation within the last two years, report “No.” If no information is available to determine if the recipient was intubated and/or placed on mechanical ventilation, report **Unknown**.

Do not report **Yes** if the recipient uses a BIPAP or CPAP machine for sleep apnea.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q62-64: Pain

Question 62: Have vaso-occlusive pain episodes occurred that required hospitalization or treatment within the last 2 years? (treatment that is in a hospital or clinic setting)

Vaso-occlusive pain, sometimes called a pain crisis, is a common painful complication of sickle cell disease in adolescents and adults. Recurrent episodes may cause irreversible organ damage.

Report **Yes** if the recipient experienced vaso-occlusive pain requiring hospitalization or treatment (i.e., ER admission, day hospital, inpatient admission, etc.) within the last two years. If the recipient did not experience vaso-occlusive pain requiring hospitalization or treatment, or if no information is available to determine if the recipient required hospitalization for vaso-occlusive pain in the past two years, report **No** or **Unknown** and go to question 65.

Questions 63 – 64: Number of episodes in the last two years:

Indicate if the number of vaso-occlusive pain episodes the recipient experienced in the last two years is **Known** or **Unknown**. If **Known**, report the number of vaso occlusive pain episodes requiring hospitalization or treatment within the past two years. If the number of vaso-occlusive pain episodes requiring hospitalization or treatment is not known within the past two years, select **Unknown**.

In this context, an “episode” is defined as being admitted to a hospital setting (i.e., ER admission, day hospital, inpatient admission, etc.) followed by a discharge. This should not be interpreted as the number of days for which the recipient was hospitalized.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q65-67: Avascular Necrosis

Question 65: Has avascular necrosis occurred?

Avascular necrosis is the death of bone tissue due to a lack of adequate blood supply. It is sometimes called osteonecrosis. Avascular necrosis can lead to minute fractures in the bone followed by eventual collapse.

Report **Yes** if the recipient developed avascular necrosis at any time between diagnosis and the start of the preparative regimen / infusion. If avascular necrosis did not occur or no information is available to determine if avascular necrosis occurred at any time between diagnosis and the start of the preparative regimen / infusion, report **No** or **Unknown** and go to question 68.

Questions 66 – 67: Specify joint(s) affected (check all that apply)

Specify the joint affected by avascular necrosis. If more than one joint was affected, select all that apply. If avascular necrosis affected a joint that is not listed, report **Other** and specify the affected joint in question 67.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q68-76: Central Nervous System

Question 68: Has a central nervous system (CNS) event occurred?

A CNS event is the development of different neurologic signs and symptoms that occur in recipients with sickle cell disease. See question 69 for a list of CNS events.

Report **Yes** if the recipient experienced a CNS event at any time between diagnosis and the start of the preparative regimen / infusion. If a CNS event did not occur or no information is available to determine if a CNS event occurred, report **No** or **Unknown**, respectively and go to question 77.

> **Note: CNS Events – Reporting Multiple Events**
> **FormsNet3 SM application**: Complete questions 69 – 76 for each CNS event the recipient experienced by adding an additional instance in the FormsNet3 SM application. Only report the initial event and applicable information at the time of onset. Do **not** report follow-up scans.
> **Paper form submission**: Copy questions 69 – 76 and complete for each CNS event the recipient experienced. Only report the initial event and applicable information at the time of onset. Do **not** report follow-up scans.

Question 69: Specify type of CNS event

Indicate the type of CNS event that occurred. If multiple events occurred, report each event as a separate instance, even if it is the same event experienced at different times.

- **Cerebral venous thrombosis**: A blood clot in the cerebral vein in the brain.
- **Hemorrhagic stroke**: Blood vessels break and bleeds in the brain.
- **Ischemic stroke**: The most common type of stroke. Occurs when a blood vessel in the brain is blocked or narrowed, causing reduced blood flow.
- **Moyamoya**: A rare condition where the carotid artery is blocked or narrowed which reduces the blood flow to the brain.
- **Overt stroke**: A focal neurological deficit lasting more than 24 hours. If the type of CNS event is not documented and only noted as a “stroke,” select this option.
- **Seizure**: Uncontrolled electrical activity in the brain, which may produce a physical convulsion, minors physical sings, thought disturbances or a combination of symptoms.
- **Silent stroke**: Asymptomatic stroke.
- **Transient ischemic stroke**: A temporary period of mild stroke symptoms that lasts only a few minutes and does not result in permanent damage. This is also known as transient ischemic attack or a ministroke.

Questions 70 – 71: Year of onset

Indicate if the year of onset of the CNS event reported is **Known** or **Unknown**. If **Known**, report the year of onset in question 71. If the year of onset is not known, select **Unknown**.

Questions 72 – 73: Was an MRI / MRA of the brain performed for the diagnosis of this reported CNS event?

Magnetic resonance imaging (MRI) is an imaging technique used to form pictures of the anatomy and the physiological processes of the body. Magnetic resonance angiography (MRA) is similar to MRI but is used to specifically examine blood vessels.

Indicate if an MRI or MRA was performed to diagnose the reported CNS event. If **Yes**, indicate if a copy of the *diagnostic* MRI / MRA report is attached. Only attach the MRI / MRA report performed "at diagnosis" of the CNS event – do not attach an MRI / MRA report performed at any other time-point. The diagnostic MRI / MRA report may not be the most recent scan performed prior to the start of the preparative regimen.

For instructions on how to attach documents in FormsNet3 ^{SM}, refer to the Training Guide.

If an MRI / MRA was not performed to diagnose the reported CNS event or if no information is available to determine if an MRI / MRA was performed at diagnosis of the CNS event, report **No** or **Unknown**, respectively.

Questions 74 – 76: Was transcranial doppler velocity assessed for this reported CNS event?

Transcranial doppler and transcranial color doppler are types of ultrasonography that measure the velocity of blood flow through the brain's blood vessels by measuring the echoes of ultrasound waves moving trans-cranially.

Indicate if transcranial doppler velocity was assessed at the time of diagnosis for the reported CNS event. If **Yes**, report the date of the assessment and the transcranial doppler velocity value in cm / sec. If transcranial doppler velocity was not assessed or if no information is available to determine if transcranial doppler velocity was assessed at the time of diagnosis for the reported CNS event, report **No** or **Unknown**, respectively and go to question 77.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q77-85: Other Symptoms

Priapism: Questions 77 – 78 are applicable to only biologically male recipients.

Question 77: Did one or more episodes of priapism occur? (to be answered for males only)

Priapism is defined as prolonged erection of the penis, usually without sexual arousal.

Report **Yes** if the recipient experienced one or more episodes of priapism (with or without treatment) at any time between diagnosis and the start of the preparative regimen. If the recipient did not experience priapism or no information is available to determine if the recipient experienced priapism, report **No** or **Unknown**, respectively and go to question 79.

Question 78: Was surgery performed at any time to correct blood flow?

If the recipient experienced an episode(s) of priapism, indicate if surgery was required at any time to correct the blood flow. Report **Yes** if surgery was performed at any between diagnosis and the start of the preparative regimen / infusion to correct blood flow. If surgery was not performed or if no information is available to determine if surgery was performed to correct blood flow as a result of priapism, report **No** or **Unknown**, respectively.

Question 79: Has sickle cell retinopathy developed?

Sickle cell retinopathy is an ocular manifestation of sickle cell disorders characterized by ocular damage due to trapping of sickle-shaped cells in the small blood vessels of the eye. Diagnosis of sickle cell retinopathy should be made by an ophthalmologist and is typically documented within the recipient's medical record.

Indicate **Yes** if the recipient developed sickle cell retinopathy at any time between diagnosis and the start of the preparative regimen / infusion. Report **No** if there is no evidence of sickle cell retinopathy. The **Unknown** option should be selected sparingly and only when no information is available to determine if sickle cell retinopathy was diagnosed.

Question 80: Have chronic leg ulcers developed?

Chronic leg ulcers are defined as a defect of the skin below the level of the knee persisting for more than six weeks with no tendency to heal after three or more months.

Indicate whether the recipient developed chronic leg ulcers at any time between diagnosis and the start of the preparative regimen / infusion. If chronic leg ulcers developed, report Yes. If chronic leg ulcers did not develop or if no information is available to determine if chronic leg ulcers developed, report **No** or **Unknown**, respectively.

Question 81: Is there a diagnosis of asthma or a reactive airway disease?

Asthma is a condition where the airways narrow, swell, and produce extra mucus which results in breathing difficulty, coughing, wheezing, and shortness of breath. Reactive airway disease (RAD) is a general term used to describe coughing, wheezing or shortness of breath when a specific diagnosis has not been made (i.e., asthma, chronic obstructive pulmonary disease, etc.).

Indicate if there was a diagnosis of asthma or a reactive airway disease prior to the start of the preparative regimen / infusion. If the recipient has a diagnosis of asthma or a reactive airway disease, report **Yes**. If the recipient was not diagnosed with or if no information is available to determine if there was a diagnosis of asthma or reactive airway disease, report **No** or **Unknown**, respectively.

Questions 82: Has a venous thrombosis embolism developed?

Venous thrombosis embolism, also called a venous thromboembolism, is a condition characterized by formation of blood clots in deep veins of the body. These clots typically manifest in the lower leg, thigh, or pelvis, but have been noted to occur in the arm.

Indicate if the recipient developed a venous thrombosis embolism prior to the start of the preparative regimen / infusion. If a venous thrombosis embolism developed, report **Yes** continue with question 83. If a venous thrombosis embolism did not develop or if no information is available to determine if a venous thrombosis embolism developed, select **No** or **Unknown**, respectively and go to question 84.

Question 83: Was it associated with an indwelling (central line) catheter?

There are several types of long term indwelling central line catheters used to access veins. Examples include Hickman, Broviac, PICC, etc. which carry a risk of developing a blood clot.

Indicate **Yes** or **No** if the venous thrombosis embolism was associated with the recipient’s indwelling (central line) catheter.

Questions 84: Has a pulmonary embolism developed?

Pulmonary embolism is a medical condition where a blood clot is lodged in an artery of the lung, blocking blood flow to that area.

Indicate if the recipient developed a pulmonary embolism between diagnosis and the start of the preparative regimen / infusion. If a pulmonary embolism developed, report **Yes** and continue with question 85. If a pulmonary embolism did not develop or if no information is available to determine if a pulmonary embolism developed, select **No** or **Unknown**, respectively and go to question 86.

Question 85: Was it associated with an indwelling catheter?

There are several types of long term indwelling central line catheters used to access veins. Examples include Hickman, Broviac, PICC, etc. which carry a risk of developing a blood clot.

Indicate **Yes** or **No** if the pulmonary embolism was associated with the recipient’s indwelling (central line)

catheter.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q86-92: Disease Modifying Therapies

Question 86: Were disease modifying therapies given? (excludes blood transfusions)

Indicate if the recipient received disease modifying therapies (see question 87 for a list of common disease modifying therapies) at any time between diagnosis and the start of the preparative regimen / infusion; excluding blood transfusion(s). If the recipient received disease modifying therapies, report **Yes**. If the recipient did not receive disease modifying therapies or if no information is available to determine if the recipient received disease modifying therapies, select **No** or **Unknown**, respectively and go to question 93.

> **Note: Disease Modifying Therapies**
> **FormsNet3 SM application:** Complete questions 87 – 92 for each disease modifying therapy administered by adding an additional instance in the FormsNet3 SM application.
> **Paper form submission:** Copy questions 87 – 92 and complete for each disease modifying therapy administered.

> **Note: Same Therapy Restarted**
> If the same therapy was started and stopped multiple times prior to the start of the preparative regimen, only one instance needs to be reported.

Questions 87 – 88: Specify the disease modifying therapy:

Select the disease modifying therapy administered as part of the line of therapy being reported. If the recipient received a therapy which is not listed, select "**Other**" and specify the treatment in question 88. Report the generic name of the agent, not the brand name.

- **Crizanlizumab (Adakveo)**: A monoclonal antibody given to reduce the frequency of vaso-occlusive crises.
- **Hydroxyurea**: A type of chemotherapy. Common brand names include Droxia and Hydrea.
- **L-Glutamine (Endari)**: An amino acid in the form of an oral powder given to reduce the complications of sickle cell disease.
- **Voxelotor (Oxbryta)**: An oral medication given to inhibit sickle hemoglobin polymerization.

Questions 89 – 90: Date therapy started:

Indicate whether the therapy start date is **Known** or **Unknown**. If the therapy start date is **Known**, report the date the recipient began this line of therapy. If the start date is partially known (i.e., the recipient started treatment in mid- July 2010), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

If the therapy start date is not known, report **Unknown**.

Questions 91 – 92: Date therapy stopped

Indicate if the stop date is **Known** or **Unknown**. If the therapy is being given in cycles (i.e., Crizanlizumab), report the date the recipient started the last cycle for this line of therapy. Otherwise, report the final administration date for the therapy being reported. If the stop date is partially known, use the process for reporting partial or unknown dates as described in the General Instructions, Guidelines for Completing Forms.

If the disease modifying therapy stop date is not known, select **Unknown**.

Report **Not applicable** if the recipient is still receiving therapy at the start of the preparative regimen / infusion.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q93-119: Other Laboratory Studies

Questions 93 – 94: Was hemoglobin electrophoresis performed?

Indicate if hemoglobin electrophoresis studies were performed prior to the start of the preparative regimen / infusion. If hemoglobin electrophoresis studies were performed, report **Yes** and provide the date of the most recent hemoglobin electrophoresis study performed prior to the start of the preparative regimen / infusion.

If hemoglobin electrophoresis studies were not performed or if no information is available to determine if hemoglobin electrophoresis studies were performed prior to the start of the preparative regimen or infusion, report **No** or **Unknown**, respectively and go to question 108.

If RBC transfusion(s) were given within four weeks of the hemoglobin electrophoresis, report **Not applicable**.

Questions 95 – 107: Specify the hemoglobin allele types based on the reported sample

Specify the hemoglobin allele types identified in the reported hemoglobin electrophoresis study (reported above in question 94). If the hemoglobin allele type was identified, report **Yes** and specify the percentage. If additional sickle related hemoglobin allele types are identified and not listed as options on the form, report **Yes** for *Other sickle related hemoglobin allele type* in question 105, specify the other hemoglobin allele type, and provide the percentage.

Report **No** if the specified hemoglobin allele type was not assessed.

Questions 108 – 110: Were red blood cell counts tested?

Red blood cell counts are part of a complete blood count panel. Indicate if red blood cell counts were assessed prior to the start of the preparative regimen / infusion. If red blood cell (RBC) counts were assessed, report **Yes**, provide the RBC cell count in cells / µL and specify the date the sample was collected for examination. If the RBC count was assessed multiple times prior to the start of the preparative regimen / infusion, report the value and date of the most recent assessment.

If RBC counts were not assessed or if no information is available to determine if RBC counts were assessed, select **No** or **Unknown**, respectively and go to question 111.

If the sample collection date is partially known (i.e., the recipient's RBC counts were measured in mid-July 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Questions 111 – 113: Were reticulocyte counts tested?

Indicate if reticulocyte counts were assessed prior to the start of the preparative regimen / infusion. If reticulocyte counts were assessed, report **Yes**. Provide the reticulocyte cell count in cells / µL and specify date the sample was collected for examination. If the reticulocyte count was assessed multiple times prior to

the start of the preparative regimen / infusion, report the value and date of the most recent assessment.

If reticulocyte counts were not measured or if no information is available to determine if reticulocyte counts were assessed, select **No** or **Unknown**, respectively.

If the sample collection date is partially known (i.e., the recipient's RBC counts were measured in mid-July 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Questions 114 – 116: Were soluble transferrin receptors (sTfR) tested?

Soluble transferrin receptors (sTfR) are proteins found in the blood and used as a measure of functional iron status. These levels are typically elevated in individuals with an iron deficiency (i.e., iron deficiency anemia). This assessment is a blood test and may be performed at the transplant center or by an outside facility.

Indicate if sTfR was tested prior to the start of the preparative regimen / infusion. If sTfR counts were assessed, report **Yes**, provide the sTfR value in mg / L, and specify the date the sample was collected for examination. If the sTfR was assessed multiple times prior to the start of the preparative regimen / infusion, report the value and date of the most recent assessment.

If the sTfR was not measured or if no information is available to determine if sTfR was assessed, select **No** or **Unknown**, respectively and go to question 117.

If the sample collection date is partially known (i.e., the recipient's RBC counts were measured in mid-July 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Questions 117 – 119: Was an erythropoietin (EPO) level obtained?

Erythropoietin (EPO) is a hormone predominantly produced in the kidneys which plays a critical role in the production of red blood cells.
Indicate if an EPO level was obtained prior to the start of the preparative regimen / infusion. If EPO levels were assessed, report **Yes**, specify the EPO level in IU / L, and report the date the sample was collected for examination. If the EPO was assessed multiple times prior to the start of the preparative regimen / infusion, report the value and date of the most recent assessment.

If EPO levels were not measured or if no information is available to determine if EPO levels were assessed, select **No** or **Unknown**, respectively go to question 120.

If the sample collection date is partially known (i.e., the recipient's RBC counts were measured in mid-July 2019), use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020

Q120-121: Reason for Transplant

Questions 120 – 121: What was the PRIMARY reason for infusion?

Specify the recipient's *primary* reason for the infusion. If the indication for transplant is not listed, report **Other** and specify the reason in question 121.

If there are multiple indications for which the recipient is receiving the infusion, confirm with the physician the primary reason; only one indication may be reported.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
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Last modified: Dec 22, 2020