2016: PCD Pre-Infusion

The Plasma Cell Disorder Pre-Infusion Data Form (Form 2016) is one of the Comprehensive Report Forms. This form captures PCD-specific pre-infusion data such as: disease classification at diagnosis, hematologic findings at the time of diagnosis and prior to the start of the preparative regimen, amyloidosis organ involvement at diagnosis and prior to the start of the preparative regimen, pre-HCT treatments administered and the best response to each line of therapy, and disease status prior to the start of the preparative regimen.

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 "Multiple myeloma/plasma cell disorder (PCD)."

Subsequent Transplant

Report "no" and go to question 1 in any of the following scenarios:

- This is the first infusion reported to the CIBMTR; or
- This is a second, or subsequent, transplant for a different disease (e.g., the patient was previously transplanted for a disease other than a Plasma Cell Disorder/Multiple Myeloma); or
- This is a second, or subsequent, infusion for the <u>same disease subtype</u> and this <u>baseline disease insert was not completed for the previous transplant</u> (e.g., 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 157 in any of the following scenarios:

- This is a second, or subsequent, transplant for <u>relapse or progression of the same disease</u>; or
- This is an infusion for the <u>same disease</u>, and this <u>baseline PCD disease insert was completed previously</u>.

<u>Links to Sections of the Form</u>
[Q1-2: Disease Assessment at Diagnosis](#)
[Q3-60: Laboratory Studies at Diagnosis](#)
[Q61-124: Amyloidosis Organ Involvement at Diagnosis](#)
[Q125-156: POEMS Syndrome Assessment at Diagnosis](#)
[Q157-187: Pre-HCT Therapy](#)
[Q188-255:Laboratory Studies at Last Evaluation Prior to the Start of the Preparative Regimen](#)
[Q256-290: Amyloidosis Organ Involvement at Last Evaluation Prior to the Start of the Preparative Regimen](#)
[Q291-296:Disease Status at Last Evaluation Prior to the Start of the Preparative Regimen](#)

<u>Manual Updates:</u>
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
10/23/2020	2016: PCD Pre-Infusion	Modify	Provided clarification and additional examples on how to report next generation flow (NGF) in questions 225-228.
10/7/2020	2016: PCD Pre-Infusion	Modify	Clarification updated to provide instructions on how to report lines of therapy for subsequent infusions to be consistent: ~~If this form is being completed for a second or subsequent transplant for relapse or progression of the same disease, report all therapy given for relapse or progression of disease. Do not report maintenance therapy given after the prior transplant, as this will be captured on the post-transplant disease inserts associated with the prior transplant.~~ **Lines of Therapy and Subsequent Infusions** *If this is a subsequent infusion and a 2016 was completed for the previous infusion, lines of therapy do not need to be reported in duplication on the subsequent 2016. Please report from post previous infusion to time of preparative regimen / infusion for the current infusion. If a 2016 was not previously completed, all lines of therapy from diagnosis to the current preparative regimen / infusion must be completed.*
5/8/2020	2016: PCD Pre-Infusion	Add	Added guidance for question 139-140 to document unit of measure to the nearest tenth.
5/8/2020	2016: PCD Pre-Infusion	Add	Added guidance for question 142-143 to document unit of measure to the nearest tenth.
5/7/2020	2016: PCD Pre-Infusion	Add	Added guidance for question 192: "**Question 192 is disabled and should *not* be answered. This question will be removed when the form is next revised**".
3/27/2020	2016: PCD Pre-Infusion	Modify	Modified sentence referring reader to question 188 for POEMS syndrome to recipient having a primary disease of monoclonal gammopathy of renal significance (MGRS) in the section Q157-187: Pre-HCT Therapy.
3/23/2020	2016: PCD Pre-Infusion	Add	Added guidance on LV straing percentage to questions 77-78 and 262-263.
1/24/2020	2016: PCD Pre-Infusion	Modify	Version 3 of the 2016: Plasma Cell Disorders (PCD) Pre-Infusion Data section of the Forms Instruction Manual released. Version 3 corresponds to revision 4 of the Form 2016.

Last modified: Nov 11, 2020

Q1-2: Disease Assessment at Diagnosis

Question 1: Specify the multiple myeloma / plasma cell disorder (PCD) classification:

Specify the indication for transplant. This question will be auto-populated from the Pre-TED Disease Classification and Characteristics (2402) Form. See below for characteristics of each disease.

Plasma Cell Disorders and Characteristics

Multiple Myeloma (symptomatic)[1]

Diagnostic criteria for symptomatic multiple myeloma require clonal bone marrow plasma cells in ≥ 10% or biopsy proven bony or extramedullary plasmacytoma and any one or more of the following myeloma-defining events:

1. Evidence of end organ damage (i.e., CRAB features) that can be attributed to the underlying plasma cell proliferative disorder, specifically:
   - Hypercalcemia: serum calcium >1 mg/dL (> 0.25 mmol/L) higher than the ULN or > 11 mg/dL (> 2.75 mmol/L)
   - Renal insufficiency: creatinine clearance < 40 ml/min or serum creatinine > 2 mg/dL (> 177 µmol/L)
   - Anemia: hemoglobin > 2 g/dL (> 20 g/L) below the LLN or a hemoglobin < 10 g/dL (< 100 g/dL)
   - Bone lesions: one or more osteolytic lesions on skeletal x-ray, CT or PET-CT
2. Any one or more of the following biomarkers of malignancy:
   - Clonal bone marrow plasma cell percentage ≥ 60%
   - Involved : uninvolved serum free light chain ratio ≥ 100
   - > 1 focal lesion on MRI studies (each lesion must be ≥ 5 mm in size)

[1] (2015, October 29). International Myeloma Working Group (IMWG) Criteria for the Diagnosis of Multiple Myeloma. Retrieved February 15, 2017, from http://imwg.myeloma.org/international-myeloma-working-group-imwg-criteria-for-the-diagnosis-of-multiple-myeloma/

Plasma Cell Leukemia

- Peripheral blood absolute plasma cell count of at least 2.0 × 109/L (2,000 cells/mm3)
- ≥ 20% plasma cells in the peripheral differential white blood cell count.1

Solitary Plasmacytoma (in absence of bone marrow findings diagnostic for Multiple Myeloma or Plasma Cell Leukemia)

Extramedullary:

- A small M-protein may be present in serum and/or urine; most commonly IgA
- Extramedullary tumor of clonal plasma cells

- Normal bone marrow
- Normal skeletal survey
- No related organ or tissue impairment (end organ damage including bone lesions)

Bone Derived:

- A small M-protein may be present in serum and/or urine
- Single area of bone destruction due to clonal plasma cells
- Bone marrow not consistent with multiple myeloma
- Normal skeletal survey (and MRI of spine and pelvis if done)
- No related organ or tissue impairment (no end organ damage other than solitary bone lesion)[1]

Note: if the recipient has greater than one plasmacytoma but has not been diagnosed with another plasma cell disorder, select "other plasma cell disorder" and specify how many plasmacytomas are present and if each is bone derived or extramedullary.

Smoldering Myeloma (asymptomatic)

Smoldering myeloma is diagnosed in persons who meet the following criteria:

- Serum monoclonal (M) protein >/= 3 g/dL and/or 10-60% clonal plasma cells in the bone marrow.
- Absence of myeloma defining events
    - No end organ damage (e.g., hypercalcemia, renal insufficiency, anemia, and bone lesions; CRAB criteria) that can be attributed to the plasma cell proliferative disorder.
    - Absence of biomarkers associated with malignancy (i.e., >/= 60% clonal plasma cells in the marrow; involved : uninvolved free light chain ratio >/= 100, or more than one focal bone lesion on MRI).

Amyloidosis

Amyloidosis is the buildup of abnormally folded proteins in various tissues of the body. Affected tissues may include the kidneys, heart, liver, gastrointestinal tract, etc. In the most common type of amyloidosis, "AL amyloidosis," light chains from antibodies function as the amyloid protein, building up within organs and disrupting organ function. Serum and urine tests are useful for evaluating amyloidosis, but a tissue biopsy is the best way to diagnose the condition.

Osteosclerotic Myeloma/ POEMS Syndrome

POEMS syndrome is poorly understood, but generally refers to **p** olyneuropathy, **o** rganomegaly, **e** ndocrinopathy, **M** protein, and **s** kin changes. Diagnosis may be made using the following diagnostic criteria: Mandatory Criteria (both of the following):

- Polyneuropathy (typically demyelinating)

- Monoclonal plasma cell proliferative disorder

Major Criteria (at least one of the following required)

- Castleman disease
- Osteosclerotic bone lesions
- VEGF elevation

Minor Criteria (at least one of the following required):

- Organomegaly (splenomegaly, hepatomegaly, lymphadenopathy)
- Edema (edema, pleural effusion, or ascites)
- Endocrinopathy (adrenal, thyroid‡, pituitary, gonadal, parathyroid, pancreatic‡)
- Skin changes (hyperpigmentation, hypertrichosis, plethora, hemangiomata, white nails)
- Papilledema
- Thrombocytosis

† Osteosclerotic lesion or Castleman disease is usually present.

‡ Because of the high prevalence of diabetes mellitus and thyroid abnormalities, this diagnosis alone is not sufficient to meet this minor criterion.[2]

[1] The International Myeloma Working Group. Criteria for the classification of monoclonal gammopathies, multiple myeloma, and related disorders: a report of the international myeloma working group. Brit J Haematol. 2003;121(5):749-57.

[2] Dispenzieri A, Kyle RA, Lacy MQ, et al. POEMS syndrome: definitions and long-term outcome. Blood. 2003;101(7):2496-506.

[3] UNC Kidney Center, University of North Carolina. Light Chain Deposition Disease. 5 Apr. 2013. Accessed at: http://www.unckidneycenter.org/kidneyhealthlibrary/lightchain.html Accessibility verified on October 21, 2013

Monoclonal Gammopathy of Renal Significance (MGRS)

Monoclonal gammopathy of renal significance (MGRS), similar to monoclonal gammopathies of unknown significance (MGUS), represent a group of disorders in which a monoclonal immunoglobulin is secreted by a non-malignant or pre-malignant B cell or plasma cell clone. MGRS is characterized by demonstrated renal damage attributable to the underlying M-protein, unlike MGUS patients who exhibit no end-organ damage. By definition and classification criteria, these disorders differ from symptomatic myeloma and lymphoproliferative disorders. Patients diagnosed with MGRS are at risk of developing progressive renal disease in addition to other hematologic disorders[4].

Monoclonal Gammopathy of Undetermined Significance (MGUS)

MGUS is a clinically asymptomatic premalignant clonal plasma cell or lymphoplasmacytic proliferative disorder. It is defined by the presence of a serum monoclonal protein (M protein) at a concentration <3 g/dL, a bone marrow with < 10% monoclonal plasma cells and absence of end-organ damage (lytic bone lesions, anemia, hypercalcemia, renal insufficiency, hyperviscosity) related to the proliferative process.

[1] The International Myeloma Working Group. Criteria for the classification of monoclonal gammopathies, multiple myeloma, and related disorders: a report of the international myeloma working group. Brit J Haematol. 2003;121(5):749-57.

[2] The Hematologist: ASH News and Reports. Monoclonal Gammopathy of Renal Significance. 16 Oct. 2018. Accessed at: https://www.hematology.org/Thehematologist/Ask/9059.aspx Accessibility verified on November 4, 2019.

Question 2: Specify preceding / concurrent disorder (check all that apply):

Indicate if the recipient had a concurrent or preceding plasma cell disorder. Many recipients progress to symptomatic myeloma from a preceding condition or have a concurrent plasma cell disorder, such as amyloidosis. See the Plasma Cell Characteristics information above for descriptions of disease and below for examples of situations with preceding or concurrent disorders. If the recipient has a preceding or concurrent plasma cell disorder that is not listed, select "other plasma cell disorder (PCD)."

Example 1. If a recipient has smoldering myeloma (asymptomatic) and then develops symptomatic multiple myeloma, "multiple myeloma (symptomatic)" should be reported as the primary diagnosis in question 1 and "smoldering myeloma (asymptomatic)" should be reported in question 2.

Example 2. If a recipient has smoldering myeloma (asymptomatic) and amyloidosis, "amyloidosis" should be reported as the primary diagnosis in question 1 and "smoldering myeloma (asymptomatic)" should be reported in question 2.

Example 3. If the recipient has symptomatic multiple myeloma and amyloidosis, "multiple myeloma (symptomatic)" should be reported as the primary diagnosis in question 1 and "amyloidosis" should be reported as a concurrent diagnosis is question 2.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Last modified: Dec 22, 2020

Q3-60: Diagnostic Studies (Measured Prior to Any Disease Treatment)

For questions 3-60, report values obtained at diagnosis or prior to the first treatment for the plasma cell disorder for which the transplant was performed. If testing is performed multiple times prior to the start of the first treatment, report the last test before the start of treatment.

Questions 3-4: Hemoglobin:

Indicate whether the hemoglobin was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 4. If "unknown" continue with question 5.

Questions 5-6: Serum calcium:

Indicate whether the serum calcium was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 6. If "unknown," continue with question 7.

Questions 7-8: Serum creatinine:

Indicate whether the serum creatinine was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 8 and continue with question 9. If "unknown," continue with question 10.

Questions 9: Upper limit of serum creatinine:

Indicate the upper limit of normal for serum creatinine value from the laboratory report.

Questions 10-11: Serum monoclonal protein (M-spike) (only from electrophoresis):

Monoclonal gammopathy is defined as the increased production of abnormal immunoglobulins. The abnormal protein produced is called paraprotein or M-protein. Indicate whether the serum monoclonal immunoglobulin was "known" or "unknown" at the time of the plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 11. If "unknown" or "not applicable," continue with question 12. Report "not applicable" for recipients with non-secretory myeloma.

Do not report immunofixation results here.

Questions 12-13: Serum immunofixation:

Indicate whether the serum paraprotein was detected on serum immunofixation. If detected, report "known" in question 12 and indicate the M-spike type, including both the heavy and light chain distinctions, in

question 13. The involved heavy chain and light chain can be identified but not quantified using this test. If the heavy chain is IgM, ensure that the disease subtype is not Waldenstrom's Macroglobulinemia. If the disease subtype is Waldenstrom's Macroglobulinemia, complete Form 2019 and update the Pre-TED form to indicate that Waldenstrom's is the transplant indication. If multiple M-spike types are involved, select each that are present in question 13 (e.g. IgG Kappa and IgA Lambda). Report "no bands present" if serum immunofixation was performed but no paraprotein was identified. Report "Not applicable" for recipients with non-secretory myeloma.

Table 2. Concept of Clonality in Multiple Myeloma

Type of Myeloma	M-Proteins Expressed
Plasma Cell Myeloma	One heavy chain (IgG, IgA, etc.) and one light chain (either kappa or lambda)
Bi-Clonal Myeloma	Two different M-proteins (e.g., IgG Kappa and IgA Lambda)

Questions 14-15: Serum free light chains – κ (kappa):

Indicate whether the serum κ (kappa) free light chain level was "known" or "unknown" at the time of plasma cell disorder diagnosis. This value should reflect the quantity of serum free light chains, not a quantification of total light chains. If "known," report the value and unit of measure documented on the laboratory report in question 15 and continue with question 16. If "unknown" or "not applicable," continue with question 17. Report "Not applicable" for recipients with non-secretory myeloma. Do not report total light chains as serum free light chains.

Question 16: Upper limit of normal for κ free light chain:

Indicate the upper limit of normal for κ (kappa) free light chain value and the unit of measure from the laboratory report.

Questions 17-18: Serum free light chains – λ (lambda):

Indicate whether the serum λ (lambda) free light chain level was "known" or "unknown" at the time of plasma cell disorder diagnosis. This value should reflect the quantity of serum free light chains, not a quantification of total light chains. If "known," report the value and unit of measure documented on the laboratory report in question 18 and continue with question 19. If "unknown" or "not applicable," continue with question 20. Report "Not applicable" for recipients with non-secretory myeloma.

Question 19: Upper limit of normal for λ free light chains:

Indicate the upper limit of normal for λ (lambda) free light chain value and the unit of measure from the laboratory report.

Questions 20-21: IgG:

Indicate whether the IgG level was "known" or "unknown" at the time of plasma cell disorder diagnosis. If

"known," report the value and unit of measure documented on the laboratory report in question 21 and continue with question 22. If "unknown," continue with question 23.

Question 22: Upper limit of normal for IgG:

Indicate the upper limit of normal for IgG value from the laboratory report.

Questions 23-24: IgA:

Indicate whether the IgA level was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 24 and continue with question 25. If "unknown," continue with question 26.

Question 25: Upper limit of normal for IgA:

Indicate the upper limit of normal for IgA value from the laboratory report.

Questions 26-27: IgM:

Indicate whether the IgM level was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 27 and continue with question 28. If "unknown," continue with question 29.

Question 28: Upper limit of normal for IgM:

Indicate the upper limit of normal for IgM value from the laboratory report.

Questions 29-30: IgD:

Indicate whether the IgD level was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 30 and continue with question 31. If "unknown," continue with question 32.

Question 31: Upper limit of normal for IgD:

Indicate the upper limit of normal for IgD value from the laboratory report.

Questions 32-33: IgE:

Indicate whether the IgE level was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 33 and continue with question 34. If "unknown," continue with question 35.

Question 34: Upper limit of normal for IgE:

Indicate the upper limit of normal for IgE value from the laboratory report.

> **!** **Urinary Monoclonal Protein**
> Questions 35-36 are intended to capture the 24-hour urine monoclonal protein results, not the 24-hour protein excretion (questions 38-39 capture the total protein secretion/24 hours). The results will be reported as XX g or XX g/dL. If the value is reported in XX g/dL, multiply it by the volume of the urine to determine the 24-hour urine monoclonal protein. Do not report immunofixation results here.

Questions 35-36: Urinary monoclonal protein (M-spike) / 24 hours:

Indicate whether the amount of urinary monoclonal protein was "known" or "unknown" at the time of plasma cell disorder diagnosis. The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 36. If "unknown" or "not applicable," continue with question 37. Report "not applicable" for recipients with non-secretory myeloma.

Example:
(total in g/dL of monoclonal protein) x (total urine volume) = **urinary M-protein/24 hours**
(0.145 g/dL of monoclonal protein) x (1500 mL total urine) x (1 dL/100 mL)= **2.175 g/24 hours**

Question 37: Urine light chain:

Indicate the involved light chain in the plasma cell disorder detected on urine immunofixation. The involved light chain can be identified, but not quantified, using this test. Select "not applicable" for recipients with non-secretory myeloma.

Questions 38-39: Total urine protein in 24 hours:

Indicate whether the total amount of urinary protein was "known" or "unknown" at the time of plasma cell disorder diagnosis. The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 39. If "unknown," continue with question 40. Report "not applicable" for recipients with non-secretory myeloma.

Questions 40-41: Urine albumin / creatinine ratio:

Indicate whether the urinary albumin / creatinine ratio was "known" or "unknown" at the time of plasma cell disorder diagnosis. The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 41. If "unknown," continue with question 42. This question is only required if the primary disease (question 1) is MGRS or Amyloidosis or if there is evidence / history of (question 2) MGRS or Amyloidosis.

Questions 42-43: Urine protein / creatinine ratio:

Indicate whether the urinary protein / creatinine ratio was "known" or "unknown" at the time of plasma cell disorder diagnosis. The value reported here should be based on a 24-hour urine collection. If "known,"

report the laboratory value and unit of measure documented on the laboratory report in question 43. If "unknown," continue with question 44. This question is only required if the primary disease (question 1) is MGRS or Amyloidosis or if there is evidence / history of (question 2) MGRS or Amyloidosis.

Questions 44-45: Plasma cells in bone marrow aspirate by flow cytometry:

Indicate whether the percentage of plasma cells in the bone marrow aspirate by flow cytometry was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the percentage of plasma cells in the bone marrow aspirate documented on the flow cytometry pathology report in question 45. If "unknown," continue with question 46.

Questions 46-47: Plasma cells in bone marrow aspirate by morphologic assessment:

✱ Under normal circumstances, a marrow aspirate is used to obtain the differential cell count, review morphology of the cells, and perform cytogenetic studies, flow cytometry, etc. A biopsy is obtained to evaluate the overall cellularity of the marrow. In the case of myeloma, the marrow plasma cells tend to be a patchy infiltrate rather than a diffuse infiltrate as in the case of acute leukemia. Therefore, it is possible that the plasma cell numbers may vary between the aspirate and the biopsy. For this reason, this form captures the plasma cell percentage by both methods in questions 46-49.

✱ • If the bone marrow pathology report states a range for plasma cells, enter the average of the range rounded to the nearest whole number (e.g., if 0-5%, enter 3%).
• If the report states > 90% plasma cells, enter 91% on the form.
• If the report states a marrow packed with plasma cells or sheets of plasma cells, report 99% on the form.
• If the report states < 5% plasma cells, enter 4% on the form

Indicate whether the percentage of plasma cells in the bone marrow aspirate was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the percentage of plasma cells in the bone marrow aspirate documented on the pathology report in question 47. If "unknown," continue with question 48.

Questions 48-49: Plasma cells in bone marrow biopsy:

Indicate whether the percentage of plasma cells in the bone marrow biopsy was "known" or "unknown" at the time of plasma cell disorder diagnosis. If "known," report the percentage of plasma cells in the bone marrow biopsy in question 49. If "unknown," continue with question 50.

Questions 50-52: Were immunohistochemical stains obtained (bone marrow biopsy)?

Immunohistochemical staining (IHC) is a process where tissue samples are treated with antibodies and dye. The antibodies bind to specific antigens on the surface of the cells, allowing for the identification of those cell surface markers under microscopy. Testing is often documented in the pathology report from the tissue

sample on which IHC was used.

Indicate whether immunohistochemical stains were obtained in question 50. Report "positive," "negative," or "unknown" for each marker in questions 51-52. If the report documents "dim" for a particular marker, report this as "positive." Report "unknown" for markers which were not tested or were tested, but the results are not known.

Question 53: Was a gene expression profile performed?

Gene expression profiling (GEP) allows for the analysis of thousands of genes at once, creating a global picture of cell function. GEP can distinguish cells that are actively dividing and show how cells react to specific treatments.[2]

If gene expression profiling was performed at the time of plasma cell disorder diagnosis or prior to the start of first therapy, indicate "yes" and continue with question 54. If gene expression was not performed, select "no" and continue with question 56.

[2] Brunner J, Dispenzieri A. "Forms Revision: Myeloma Changes." 2013 Tandem Meetings: CIBMTR Clinical Research Professionals/Data Manager Annual Meeting. Accessed at http://www.cibmtr.org/Meetings/ Materials/CRPDMC/Documents/2013/Feb2013/Feb13FormRevMM-6up.pdf.

Question 54: Were results considered high-risk myeloma?

Based on the opinion of a physician, indicate if the results of the gene expression profile are considered high-risk myeloma. Indicate "yes" or "no."

Question 55: Was documentation submitted to the CIBMTR (e.g., gene expression profile report)?

Indicate if a copy of the gene expression profile report is attached to support the data reported in questions 53-54. Attaching a copy of the report may prevent additional queries. For further instructions on how to attach documents in FormsNet3[SM], refer to the Training Guide .

Question 56: Was a PET / CT scan performed?

A PET / CT combines the results of the PET (Positron Emission Tomography) scan along with the results of a CT (Computed Tomography) scan. If a PET / CT scan was performed at the time of plasma cell diagnosis or prior to the start of first therapy, indicate "yes" and continue with question 57. If a PET / CT scan was not performed, select "no" and continue with question 61.

Questions 57-58: Was the PET / CT scan positive for myeloma involvement at any disease site?

Indicate if the PET / CT scan was positive for myeloma involvement at any disease site. If positive at any site, report "yes" for question 57 and specify which area(s) show involvement in question 58 .
If the PET / CT scan was negative for myeloma involvement, report "no" and continue with question 59.

Questions 59-60: Date of PET / CT scan:

Indicate if the date of the PET / CT scan was "known" or "unknown" at the time of plasma cell diagnosis or prior to the start of first therapy. If "known," report the assessment date in question 60. If "unknown," continue with question 61.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Last modified: Dec 22, 2020

Q61-124: Amyloidosis Organ Involvement at Diagnosis

> ❗ Complete questions 61-124 for patients with amyloidosis. If amyloidosis was not reported as the primary disease for transplant (question 1) or as a preceding / concurrent disorder (question 2), skip to question 125.

Question 61: Site(s) of tissue with pathologic diagnosis of amyloidosis (check all that apply):

Abdominal fat is the most common initial biopsy site when amyloidosis is suspected but other tissue sources may be examined. Most tissue samples are taken by needle aspiration and stained with Congo red dye. Samples that are positive have their normal architecture disrupted by amyloid deposits, which appear red under microscopy due to Congo red stain. Under polarized light microscopy, amyloid deposits stained with Congo red appear green (birefringence). Indicate which tissue biopsies were performed at diagnosis (or prior to the first therapy) confirming a pathologic diagnosis of amyloidosis. If the tissue source analyzed is not listed, indicate "other" and report the other tissue site in question 62.

Question 63: Was amyloid subtyping performed?

Correct identification of the amyloidosis-causing protein is critical for proper clinical management and disease prognosis. The most common methods of determining amyloid subtype are immunohistochemistry, mass spectrometry, or immunofluorescence. Indicate "yes" if amyloid subtyping was performed at diagnosis of amyloidosis or prior to the start of first therapy and continue with question 64. If subtyping analysis was not performed, report "no" and continue with question 67.

Questions 64-66: Indicate amyloid subtype:

Specify the results as determined by amyloid subtyping and indicate the testing method utilized in question 65. If a different method was used (e.g., laser microdissection of Congo red-positive deposits followed by liquid chromatography) report "other" in question 65 and specify the method used in question 66.

Question 67: Was a cardiac imaging procedure performed?

Cardiographic imaging may show amyloid infiltration in heart tissue. Cardiac MRI, echocardiogram, sometimes referred to as an echo, (do not report an ECG or EKG, which refer to electrocardiogram)], or Multiple Gate Acquisition (MUGA) scans may be performed to assess heart involvement. Indicate if cardiographic imaging was performed at diagnosis or prior to the first therapy. If "yes," continue with question 68. If "no," continue with question 79.

Question 68: Was a cardiac MRI done?

Cardiac MRI may be used to differentiate amyloid involvement from other cardiopathologies. Indicate if a

cardiac MRI was performed at diagnosis or prior to the first therapy. If "yes," continue with question 69. If "no," continue with question 71.

Question 69: Specify cardiac MRI results:

Characteristics of amyloid involvement in cardiac tissue include impaired ventricular systolic function, thickened valves, increased atrial septal thickness and left ventricular mass, pleural and pericardial effusions, and subendocardial hyperenhancement.[1] Indicate if the results of cardiac MRI were "normal," "abnormal," or "unknown ," and continue with question 70.

[1] Penugonda N. Cardiac MRI in infiltrative disorders: A concise review. Curr Cardiol Rev. 2010;6(2):134-136.

Question 70: Was documentation submitted to the CIBMTR (e.g., MRI report)?

Indicate if a copy of the cardiac MRI report is attached to support the data reported in questions 68-69. Attaching a copy of the report may prevent additional queries. For further instructions on how to attach documents in FormsNet3[SM], refer to the [Training Guide](#) .

Question 71: Was the left ventricular ejection fraction measured?

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). Indicate if the left ventricular ejection fraction (LVEF) was measured. If "yes," continue with question 72. If "no," continue with question 74.

Question 72: Specify the left ventricular ejection fraction:

Indicate the left ventricular ejection fraction at diagnosis or prior to the first therapy. Most imaging reports will report the LVEF. If the LVEF is not explicitly documented it should be determined by dividing the stroke volume (SV, the volume of blood pumped into the aorta from the left ventricle) by the end diastolic volume (EDV, the volume of blood in the left ventricle just prior to contraction) of the left ventricle . For example, if the stroke volume was 75 ml and the end diastolic volume was 150ml, the ejection fraction would be 50%.

If the recipient had multiple assessments using different methods, report the most recent assessment prior to the initiation of treatment.

Question 73: Specify the method used to determine the left ventricular ejection fraction:

Indicate the method used to determine the LVEF value.

Question 74: Was diastolic dysfunction present?

Diastole is the period in which chambers of the heart fill with blood. Diastolic dysfunction may be

characterized by the difficulty of the ventricles to expand and contract appropriately due to stiffening of the heart walls by amyloid deposits. Indicate if diastolic dysfunction was present. Specify "yes," "no," or "unknown," and continue with question 75.

Questions 75-76: Specify the intraventricular septal wall thickness measured by echocardiogram:

The heart is divided into the right and left sides by the septum. The area between the left and right ventricles is the intraventricular septum. Indicate if the intraventricular septal thickness is "known" or "unknown." If "known," based on evaluation by echocardiogram, indicate the thickness of the intraventricular septal wall in question 76. If "unknown," or not measured by echocardiogram, continue with question 77.

Questions 77-78: Specify left ventricular (LV) strain percentage:

A strain pattern, as determined by electrocardiography, is a well-recognized marker of hypertrophy of the left ventricular (LVH) and is characterized by ST depression and T wave inversion on a resting ECG / EKG. The LV strain percentage is typically a negative percentage. The normal range for the LV global longitudinal strain (LV GLS) is -15.9% to -22.1%. Indicate if the left ventricular strain percentage is "known" or "unknown." If "known," based on evaluation by electrocardiogram, indicate the strain percentage in question 78. If "unknown," or not measured by electrocardiogram, continue with question 79.

Questions 79-80: Were any serum cardiac biomarkers assessed?

Assessment of cardiac biomarkers helps determine if injury to cardiac tissue has occurred. Cardiac biomarkers include brain natriuretic peptide (BNP), N-terminal prohormone brain natriuretic peptide (NT-proBNP), troponin I, troponin T, and high-sensitivity troponin T. Indicate if serum cardiac biomarkers were assessed at diagnosis or prior to first therapy. If "yes," report the date assessed in question 80 and continue with question 81. If "no" or "unknown," continue with question 96.

Questions 81-82: Brain natriuretic peptide (BNP):

Indicate if the BNP was assessed at the time of amyloidosis diagnosis. If "yes," report the value (in pg/mL) in question 82 and continue with question 83. If "no," continue with question 84.

Question 83: Upper limit of normal for BNP:

Indicate the upper limit of normal for BNP (in pg/mL) from the laboratory report.

Questions 84-85: N-terminal prohormone brain natriuretic peptide (NT-proBNP):

Indicate if the NT-proBNP was assessed at the time of amyloidosis diagnosis. If "yes," report the value (in pg/mL) in question 85 and continue with question 86. If "no," continue with question 87.

Question 86: Upper limit of normal for NT-proBNP:

Indicate the upper limit of normal (in pg/mL) for NT-proBNP from the laboratory report.

Questions 87-88: Troponin I:

Indicate if the Troponin I was assessed at the time of amyloidosis diagnosis. If "yes," report the value (in µg/ L) in question 88 and continue with question 89. If "no," continue with question 90.

Question 89: Upper limit of normal for troponin I:

Indicate the upper limit of normal (in µg/L) for Troponin I from the laboratory report.

Questions 90-91: Troponin T:

Indicate if the Troponin T was assessed at the time of amyloidosis diagnosis. If "yes," report the value (in µg/L) in question 91 and continue with question 92. If "no," continue with question 93.

Question 92: Upper limit of normal for Troponin T:

Indicate the upper limit of normal (in µg/L) for Troponin T from the laboratory report.

Questions 93-94: High-sensitivity troponin T:

Indicate if the high-sensitivity troponin T was assessed at the time of amyloidosis diagnosis. If "yes," report the value (in ng/L) in question 94 and continue with question 95. If "no," continue with question 96.

Question 95: Upper limit of normal for high-sensitivity troponin T:

Indicate the upper limit of normal (in ng/L) for high-sensitivity troponin T from the laboratory report.

Questions 96-97: 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 diagnosis or prior to the first therapy. If "yes," report the total distance walked and specify the unit of measure in question 97. If "no," continue with question 98.

Question 98: Specify the recipient's New York Heart Association functional classification of heart failure: (Symptoms may include dyspnea, chest pain, fatigue, and palpitations; activity level should be assessed with consideration for patient's age group)

Indicate the recipient's New York Heart Association functional classification at diagnosis or prior to the first therapy using the following guidelines:

- Class I – Able to perform ordinary activities without symptoms; no limitation of physical activity
- Class II – Ordinary physical activity produces symptoms; slight limitation of physical activity
- Class III – Less-than-ordinary physical activity produces symptoms; moderate limitation of physical activity
- Class IV – Symptoms present even at rest; severe limitation of physical activity

If the recipient's NYHA functional classification it not known, select "unknown."

Question 99: Recipient blood pressure:

Indicate if the recipient's blood pressure was assessed at diagnosis of amyloidosis. If "known," continue with question 100. If "unknown," continue with question 102.

Questions 100-101: Recipient blood pressure results:

Report the recipient's blood pressure at diagnosis of amyloidosis in question 100 and indicate in which body position the measurement was taken in question 101. If testing is performed multiple times prior to the start of the first treatment, report the last test before the start of treatment .

Question 102: Did the recipient develop pericardial effusion?

Indicate if the recipient developed pericardial effusion and continue with question 103.

Question 103: Was hepatomegaly present on radiographic imaging (liver span > 15 cm) or on examination (liver edge palpable > 3 cm below right costal margin)?

At the time of diagnosis or prior to first therapy, indicate if the liver spanned more than 15 cm (by radiographic imaging) or the edge of the liver was palpable more than 3 cm (by physical examination). Indicate "yes" if hepatomegaly was present. Indicate "no" if hepatomegaly was not present. Indicate "unknown" if it was not possible to determine the presence or absence of hepatomegaly.

Questions 104-105: Specify the level of serum alkaline phosphatase:

Indicate whether the alkaline phosphatase (ALP) level at the time of amyloidosis diagnosis or prior to first treatment is "known" or "unknown." If "known," report the laboratory value and unit of measure documented on the laboratory report in question 105 and continue with question 106. If "unknown," continue with question 107.

Question 106: Upper limit of normal for alkaline phosphatase:

Report the upper limit of normal for ALP from the laboratory report.

Question 107: Was there clinical suspicion of gastrointestinal (GI) involvement?

GI involvement by amyloidosis is usually proven by biopsy; however, clinical symptoms of gastrointestinal involvement may include esophageal reflux, constipation, nausea and abdominal pain, diarrhea, weight loss, or early satiety (fullness).[2] Indicate if there was any clinical suspicion of GI involvement at diagnosis or prior to the first therapy. If "yes," continue with question 108. If "no" or "unknown," continue with question 109.

[2] Cowan AJ, Skinner M, Seldin DC, Berk JL, Lichtenstein DR, O'Hara CJ, Doros G, Sanchorawala V. Amyloidosis of the gastrointestinal tract: A 13-year, single-center, referral experience. Haematologica. 2013;98(1):141-146.

Question 108: Specify the site(s) of GI involvement (check all that apply):

Symptoms of GI involvement may include, but are not limited to, esophageal reflux, nausea, abdominal pain, constipation, diarrhea, or weight loss. Indicate all sites with clinical suspicion of GI involvement. Select all sites that apply and continue with question 109.

Question 109: Was a sensory/motor exam performed?

Indicate if a sensory/motor exam was performed. This exam evaluates the neurological status of the recipient and consists of assessing the recipient's body positioning, involuntary movements, muscle tone, muscle strength, ability to sense pain and light touch, position sense (proprioception), stereognosia (ability to discern an object with eyes closed, such as a coin), graphesthesia (ability to identify number of letter drawn on skin with eyes closed), and extinction (ability to discern multiple simultaneous stimuli).[3] If a sensory/motor exam was performed, indicate "yes," and continue with question 110. If "no" or "unknown," continue with question 111.

[3]NYU School of Medicine; Russell S, Triola M. The Precise Neurological Exam. available at: http://informatics.med.nyu.edu/modules/pub/neurosurgery/ Accessibility verified April 7, 2013.

Question 110: Specify the exam results:

Indicate the results of the sensory/motor exam. If the recipient's sensory/motor exam was within normal limits, select "normal." If it is clinically documented that the sensory/motor exam showed "intact" results, these should be interpreted as "normal." If the recipient displayed neurologic impairment, select "abnormal." Continue with question 111.

Questions 111-112: Did the recipient display any other evidence of peripheral nerve involvement for amyloidosis ?

Indicate if the recipient displayed any other evidence of peripheral nerve involvement (other than displayed on sensory/motor examination and nerve biopsy). If "yes," specify the other evidence in question 112 and continue with question 113. If "no," continue with question 113.

Examples of other peripheral nerve involvement for amyloidosis include (but are not limited to): carpal tunnel syndrome, painful paresthesias in the legs, etc.

Question 113: Did the recipient display symptomatic orthostatic hypotension (not attributable to medications or volume depletion)?

Orthostatic hypotension is a decrease in blood pressure (systolic by 20 mmHg or diastolic by 10 mmHg) within 3 minutes of standing from a sitting or lying down position. Symptoms include "dizziness, lightheadedness, blurred vision, weakness, fatigue, nausea, palpitation and headache."[4] Indicate if the recipient had evidence of orthostatic hypotension at diagnosis, or prior to first therapy, that was not attributable to medications or volume depletion.

[4] Lanier JB, Mote MB, Clay EC. Evaluation and management of orthostatic hypotension. Am Fam Physician. 2011;84(5):527-536.

Questions 114-115: Did the recipient display any other evidence of autonomic neuropathy (e.g., pseudo-obstruction or intractable diarrhea)?

Indicate if the recipient had any other evidence of autonomic neuropathy, such as pseudo-obstruction or intractable diarrhea, at the time of diagnosis or prior to first therapy. If "yes," specify the other evidence in question 115. If "no," continue with question 116.

Pseudo-obstruction is a condition in which food does not pass through the intestines as if the intestines were blocked; however, rather than a blockage, it is caused by nerve damage within the intestinal tract.

Intractable diarrhea is diarrhea that cannot be stopped by medication.

Question 116: Did the recipient display any other clinical involvement?

Indicate if the recipient displayed any other clinical manifestations at the time of diagnosis or prior to first therapy. Please review the preceding sections starting from question 67 and ensure that any manifestations reported here do not already have a specific place for reporting. If the recipient displayed clinical involvement not already reported elsewhere, select "yes" and continue with question 117. If "no," continue with question 119.

Questions 117-118: Specify the evidence of other organ involvement (check all that apply):

For each option, indicate if there was evidence of other organ involvement. If there was other organ involvement not listed in this section, select "other organ involvement" in question 117 and specify the other organ in question 118.

Examples may include:

- Arthropathy is a disease of the joints. An example of a common arthropathy in patients with amyloidosis is carpal tunnel-like symptoms.
- Amyloid deposits may be found in the lung, impairing their function. Examples of lung involvement may be alveolar-septal disease, nodular disease, intra- and extra-thoracic adenopathy, pleural disease, and diaphragm deposition.[5]
- Soft tissue involvement, other than those already listed, may include glandular involvement (such as submandibular glands).
- Any additional organ involvement, other than those already listed, may be reported in this section as "other organ involvement." The other organ involved will then be specified in question 118.

[5] Berk JL, O'Regan A, Skinner M. Pulmonary and tracheobronchial amyloidosis. Semin Respir Crit Care Med. 2002;23(2):155-65.

Question 119: Was Factor X measured?

Factor X is a protein within the blood that is critical in coagulation and clotting processes. Indicate if Factor X was measured at the diagnosis of amyloidosis or prior to the start of first therapy. If "yes," continue to question 120. If "no," continue with question 123.

Question 120: Factor X Measurement:

Report the Factor X percentage in question 120. Indicate the type of Factor X measurement that was utilized to determine this percentage in question 121. Indicate if the recipient was actively taking Warfarin (Coumadin) at the time of Factor X analysis in question 122. Continue with question 123.

Question 123: Uric acid at diagnosis:

Elevated levels of uric acid are often due to decreased kidney function where uric acid elimination is being done inefficiently. Indicate whether the uric acid at diagnosis of amyloidosis was "known" or "unknown." If "known," report the value documented on the laboratory report in question 124. If "unknown," continue with question 125.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Last modified: Dec 22, 2020

Q125-156: POEMS Syndrome Assessment at Diagnosis

> **!** Complete questions 125-156 for POEMS patients only. If POEMS was not reported as the primary disease for transplant (question 1) or as a preceding / concurrent disorder (question 2), skip to question 157.

Questions 125-126: Specify POEMS clinical features (check all that apply):

POEMS syndrome is poorly understood, but generally refers to **P** olyneuropathy, **O** organomegaly, **E** ndocrinopathy, **M** protein, and **S** kin changes. Proper diagnosis is crucial for appropriate clinical management and varying clinical features help guide therapy. Indicate which clinical features, **specific to POEMS** only, are present at the time of diagnosis of POEMS syndrome or prior to the start of first therapy. Check all that apply. If there are other clinical features not listed in this section, select "other" in question 125, in addition to any available options that apply, and specify the other clinical feature in question 126.

Questions 127-128: Thyroid stimulating hormone (TSH):

Indicate whether the thyroid stimulating hormone (TSH) level was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value (in mU/L) in question 128 (mU/L is equivalent to µU/mL) and continue with question 129. If "unknown," continue with question 130.

Question 129: Upper limit of normal for thyroid stimulating hormone (TSH) level:

Indicate the upper limit of normal (in mU/L) for thyroid stimulating hormone (TSH) level from the laboratory report.

Questions 130-131: Testosterone level:

Indicate whether the testosterone level was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value and unit of measure documented on the laboratory report in question 131 and continue with question 132. If "unknown," continue with question 133.

Question 132: Upper limit of normal for testosterone level:

Indicate the upper limit of normal for testosterone level from the laboratory report.

Questions 133-134: Estradiol level:

Indicate whether the estradiol level was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value (in pg/mL) in question 134 and continue with question 135. If "unknown," continue with question 136.

Question 135: Upper limit of normal for estradiol level:

Indicate the upper limit of normal for estradiol level (in pg/mL) from the laboratory report.

Questions 136-137: Prolactin level:

Indicate whether the prolactin level was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value (in ng/mL) in question 137 and continue with question 138. If "unknown," continue with question 139.

Question 138: Upper limit of normal for prolactin level:

Indicate the upper limit of normal (in ng/mL) for prolactin level from the laboratory report.

Questions 139-140: Cortisol level:

Indicate whether the cortisol level was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value and unit of measure to the nearest tenth documented on the laboratory report in question 140 and continue with question 141. If "unknown," continue with question 142.

Question 141: Upper limit of normal for cortisol level:

Indicate the upper limit of normal for cortisol level from the laboratory report.

Questions 142-143: Interleukin-6:

Indicate whether the interleukin-6 value was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value (in pg/mL) to the nearest tenth in question 143 and continue with question 144. If "unknown," continue with question 145.

Question 144: Upper limit of normal for interleukin-6:

Indicate the upper limit of normal (in pg/mL) for interleukin-6 from the laboratory report.

Questions 145-146: Was pulmonary artery hypertension present?

Pulmonary hypertension (PH) refers to elevated pulmonary arterial pressure. PH can be due to 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 whether pulmonary artery hypertension was present at the time of POEMS diagnosis. If present, indicate "yes" and report the estimated systolic artery pressure documented on the laboratory report in question 146. If not present, indicate "no" and continue with question 147.

Questions 147-148: Forced vital capacity (FVC):

Forced vital capacity is the total amount of air exhaled during the forced expiratory volume test. FVC is a measurement taken during spirometry studies. Indicate whether the forced vital capacity percentage was

"known" or "unknown" at the time of POEMS diagnosis or prior to the start of first therapy. If "known," report the percentage documented on the pulmonary function test (PFT) in question 148. If "unknown," continue with question 149.

Questions 149-150: Total lung capacity :

Indicate whether the total lung capacity was "known" or "unknown" at the time of POEMS diagnosis or prior to the start of first therapy. If "known," report the value documented on the laboratory report in question 150. If "unknown," continue with question 151.

Questions 151-152: Vascular endothelial growth factor (VEGF) serum value:

Vascular endothelial growth factor (VEGF) promotes the growth of new blood vessels and acts as a signaling protein influencing the rate at which this process is performed. Indicate whether the serum-derived vascular endothelial growth factor (VEGF) value was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value documented on the laboratory report in question 152 and continue with question 153. If "unknown," continue with question 154.

Question 153: Upper limit of normal for vascular endothelial growth factor (VEGF) serum value:

Indicate the upper limit of normal for serum-derived vascular endothelial growth factor (VEGF) value from the laboratory report.

Questions 154-155: Vascular endothelial growth factor (VEGF) plasma value:

Vascular endothelial growth factor (VEGF) promotes the growth of new blood vessels and acts as a signaling protein influencing the rate at which this process is performed. Indicate whether the plasma-derived vascular endothelial growth factor (VEGF) value was "known" or "unknown" at the time of POEMS diagnosis. If "known," report the value documented on the laboratory report in question 155 and continue with question 156. If "unknown," continue with question 157.

Question 156: Upper limit of normal for vascular endothelial growth factor (VEGF) plasma value:

Indicate the upper limit of normal for plasma-derived vascular endothelial growth factor (VEGF) value from the laboratory report.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Last modified: Dec 22, 2020

Q157-187: Pre-HCT Therapy

> ❗ **Lines of Therapy and Subsequent Infusions**
> If this is a subsequent infusion and a 2016 was completed for the previous infusion, lines of therapy do not need to be reported in duplication on the subsequent 2016. Please report from post previous infusion to time of preparative regimen / infusion for the current infusion. If a 2016 was not previously completed, all lines of therapy from diagnosis to the current preparative regimen / infusion must be completed.

Question 157: Was therapy given?

Indicate if the recipient received treatment for the plasma cell disorder between the time of diagnosis and the start of the preparative regimen. If "yes," continue with question 158. If "no," continue with question 188.

Copy questions 158-187 to report more than one line of therapy.

Question 158: Systemic therapy:

Systemic therapy (e.g., chemotherapy) may be injected into a vein or given orally and is delivered to the whole body via the bloodstream. If "yes," continue with question 159. If "no," continue with question 174.

Questions 159-160: Date therapy started:

Indicate if the therapy start date is "known" or "unknown." If the therapy start date is known, enter the date the recipient began this line of therapy in question 160. 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.

Questions 161-162: Date therapy stopped:

Indicate if therapy stop date is "known" or "unknown." If the therapy stop date is known and the recipient received therapy administered in cycles, report the date the recipient started the last cycle for this line of therapy in question 162. If the recipient is still receiving therapy at the time of their transplant, report "not applicable (still receiving therapy)" and go to question 165.

If the recipient received therapy administered on a daily basis (e.g., lenalidomide therapy at 10 mg/day) report the last date the recipient received the line of therapy.

Questions 163-164: Reason stopped:

Indicate the reason that this line of therapy stopped. If the reason the line of therapy was stopped is not listed in this section, select "other" and report the specific reason in question 164.

Questions 165-166: Was a standard drug regimen given?

Systemic chemotherapy / immunotherapy may involve administration of multiple drugs / agents during the line of therapy. Rather than reporting each drug separately, standard combination regimens should be reported using the options in question 166 when available. Review the regimen options provided in question 166. If the recipient's line of therapy includes one of the regimens listed, report "yes" for question 165 and indicate the regimen that was given in question 166. If the recipient did not receive one of the standard regimens provided in question 166 as part of the line of therapy being reported, indicate "no" for question 165 and go to question 167.

Only one regimen may be reported for question 166. Generally, each regimen should be reported as a separate line of therapy. If the recipient received a regimen specified in question 166 as well as additional systemic therapy drugs as part of the line of therapy being reported, indicate the standard regimen in question 166 and report the additional drugs in 167-169.

Questions 167-169: Were systemic drugs given?

Questions 167-169 are intended to capture systemic therapy drugs / agents not already reported in questions 165-166. If part or all of the recipient's regimen can be reported in questions 165-166, report them in those questions and do not report them again in questions 167-169. If all systemic therapy drugs given as part of the line of therapy being reported were included in the regimen indicated in question 166, report "no" for question 167 and go to question 170.

If the recipient received systemic chemotherapy drugs not already reported in questions 165-166 as part of the line of therapy being reported, report "yes" for question 167 and specify the chemotherapy drug(s) in questions 168-169. Otherwise, report "no" for question 167 and go to question 170.

If the center needs to report a systemic chemotherapy drug (or drugs) in question 168, but it is not listed as an option, report "other systemic therapy" and use question 169 to specify any drugs not already reported. Only report systemic chemotherapy drugs in questions 167-169.

Question 170: Was this line of therapy given for stem cell mobilization (priming)?

Indicate "yes" if this line of therapy was given for stem cell priming. For example, high dose cyclophosphamide (Cytoxan) may be used in a myeloma patient to collect their peripheral blood stem cells (PBSCs) as they recover their white blood count. Report "no" if this line of therapy was not given for stem cell priming.

Question 171: Did the recipient receive any amyloid fibril-directed therapies?

Amyloid fibrils are protein (or peptide) aggregates that develop under certain conditions within the body. Some therapies directly target these aggregates to offset their clinical affects. Indicate "yes" if the recipient received amyloid fibril-directed therapy and continue with question 172. Answer "no" if the recipient did not receive amyloid fibril-directed therapy and continue with question 174.

Question 172-173: Specify amyloid fibril-directed therapies (check all that apply):

Indicate which amyloid fibril-directed therapies the recipient received. If the therapy administered is not listed in this section, report "other" and specify the agent given for amyloid fibril-directed therapy in question 173.

Question 174: Radiation therapy:

Radiation therapy uses high-energy radiation to kill cancer cells. For multiple myeloma, external beam radiation is the type of radiation used most frequently. In this method, a beam of radiation is delivered to a specific part of the body, such as a lytic lesion or plasmacytoma. Indicate if the recipient received radiation therapy between the time of diagnosis and the start of the preparative regimen. If "yes," continue with question 175. If "no," continue with question 181.

Questions 175-176: Date therapy started:

Indicate if the start date for radiation therapy is "known" or "unknown." If known, enter the date the line of radiation therapy began in question 176. If unknown, continue with question 177.

Questions 177-178: Date therapy stopped:

Indicate if the stop date for radiation therapy is "known" or "unknown." If known, enter the date the line of radiation therapy ended in question 178. If unknown, continue with question 179. If the recipient is still receiving radiation therapy at the time of their transplant, report "not applicable (still receiving therapy)" and go to question 181.

Questions 179-180: Dose of radiation therapy:

Enter the total dose of radiation given. If radiation was given as a single dose, the amount of radiation delivered in the single dose constitutes the total dose. If the radiation was given in fractionated doses, multiply the total number of fractions by the dose per fraction to determine the total dose. Enter the total dose of radiation in either grays (Gy) or centigrays (cGy).

Example:
Radiation order: TBI, 200 cGy/day for three days (3 doses)
Total dose: 200 cGy x 3 doses = 600 cGy
Report "Dose of radiation therapy" as 600 cGy

Question 181: Cellular therapy (e.g., CAR-T cells):

Cellular therapy treatment strategies include isolation and transfer of specific stem cell populations, administration of effector cells (e.g., cytotoxic T-cells), induction of mature cells to become pluripotent cells, and reprogramming of mature cells (e.g., CAR-T cells).

Report "yes" if the recipient received cellular therapy as part of the line of therapy being reported. If not,

report "no."

Question 182: Best hematologic response to line of therapy:

> ✳ If the recipient's primary disease is Amyloidosis (without evidence of myeloma), go to questions 184-185 to report the best response to this line of therapy (see Amyloidosis Response Criteria).

If the recipient's primary disease is monoclonal gammopathy of renal significance (MGRS), go to question 188.

Indicate the best response to the line of therapy. See the Multiple Myeloma Response Criteria section for multiple myeloma and solitary plasmacytoma disease status definitions. See Plasma Cell Leukemia Response Criteria for plasma cell leukemia disease status definitions. For more information on determining what baseline values to use to establish best response, see Appendix G.

If, at any response level, some but not all criteria are met, the best response should be downgraded to next lower level of response. The percentage of plasma cells in the bone marrow aspirate and/or biopsy may also be identified on a flow cytometry report. If high sensitivity or next generation flow cytometry was utilized, those results can be used to confirm CR (e.g., <5% plasma cells in the bone marrow.

If the disease response to this line of therapy is unknown, select "unknown" and continue with question 184.

Question 183: Date assessed:

Enter the date the best response was assessed. Report the date of the first assessment, not the date of the second confirmatory assessment. Report the date the blood/urine was collected for the laboratory evaluations (e.g., SPEP/UPEP, serum/urine immunofixation) or report the date the bone marrow was collected for pathologic examination.

If the exact date is not known, use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Question 184: Best hematologic response to line of therapy (for Amyloid patients only):

Indicate the best response to the line of therapy. See the Amyloidosis Response Criteria section for amyloidosis disease status definitions.

Question 185: Date assessed:

Enter the date the best response was assessed. Report the date of the first assessment, not the date of the second confirmatory assessment. Report the date the blood/urine was collected for the laboratory evaluations (e.g., SPEP/UPEP, serum/urine immunofixation) or report the date the bone marrow was collected for pathologic examination.

If the exact date is not known, use the process described for reporting partial or unknown dates in General Instructions, Guidelines for Completing Forms.

Question 186: Did disease relapse/progress during or following this line of therapy?

Indicate "yes" if a relapse or progression occurred during or following the line of therapy being reported and continue with question 187. Indicate "no" if the recipient did not relapse or progress following this line of therapy and continue with question 188.

See Multiple Myeloma Response Criteria and Amyloidosis Response Criteria for progressive disease and Relapse from CR disease status definitions.

Question 187: Date of relapse/progression:

Enter the date the relapse or progression was established during or following the line of therapy. Report the date the blood/urine was collected for the laboratory evaluations (e.g., SPEP/UPEP, serum/urine immunofixation) or report the date the bone marrow was collected for pathological evaluation.

If the exact date is not known, 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)
.	.	.	.	.

Last modified: Dec 22, 2020

Q188-255:Laboratory Studies at Last Evaluation Prior to the Start of the Preparative Regimen

For questions 188-255, report values obtained at the last evaluation prior to the start of the preparative regimen / infusion. If testing is performed multiple times prior to the start of the preparative regimen, report the last test before the start of the preparative regimen.

Questions 188-189: Serum β2 microglobulin:

An elevated serum β2 microglobulin protein at the last evaluation prior to the start of the preparative regimen may indicate a poorer prognosis. If this value is "known," report the value and unit of measure documented on the laboratory report in question 189. If "unknown," continue with question 190.

Question 190: Plasma cells in blood by flow cytometry:

Indicate if the value of plasma cells in the blood was assessed by flow cytometry at the last evaluation prior to the start of the preparative regimen. Report if the value of plasma cells were "known" or "unknown." If "known," go to question 191, if "unknown," continue with question 193.

Questions 191-192: Value of plasma cells in blood:

Indicate the percentage and absolute value of plasma cells detected in the blood by flow cytometry at the last evaluation prior to the start of the preparative regimen. If only the percentage of plasma cells is available, multiply the percentage of plasma cells by the white blood cell count (WBC) to determine the absolute number of plasma cells.

Question 192 is disabled and should **not** be answered. This question will be removed when the form is next revised.

Question 193: Plasma cells in blood by morphologic assessment

Indicate if the number of plasma cells in the peripheral blood was assessed by morphologic assessment at the last evaluation prior to the start of the preparative regimen. This would be found on the CBC differential. Report if the value of plasma cells were "known" or "unknown." If "known," go to question 194, if "unknown," continue with question 196.

Questions 194-195: Value of plasma cells in blood by morphologic assessment:

Indicate the percentage and absolute value of plasma cells detected in the blood by morphologic assessment at the last evaluation prior to the start of the preparative regimen. If only the percentage of plasma cells is available, multiply the percentage of plasma cells by the white blood cell count (WBC) to determine the absolute number of plasma cells.

Questions 196-197: Serum albumin:

Indicate whether the serum albumin at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." If "known," report the value and unit of measure documented on the laboratory report in question 197. If "unknown," continue with question 198.

Questions 198-199: Serum monoclonal protein (M-spike): (only from electrophoresis)

Monoclonal gammopathy is defined as the increased production of abnormal immunoglobulins. The abnormal protein produced is called paraprotein or M-protein. Indicate whether the quantity serum monoclonal immunoglobulin at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." If "known," report the value and unit of measure documented on the laboratory report in question 199. If "unknown," continue with question 200. Report "not applicable" for recipients with non-secretory myeloma.

Question 200: Serum immunofixation:

Serum immunofixation is a laboratory technique that detects and types monoclonal antibodies or immunoglobulins in the blood. If "known," continue with question 201. If "unknown" or "not applicable," continue with question 203. Report "not applicable" for recipients with non-secretory myeloma.

Question 201: Original monoclonal bands:

Indicate "yes" if the original monoclonal band was present or "no" if it was not present.

Question 202: New monoclonal (or oligoclonal) bands:

Indicate "yes" if a new monoclonal band (or oligoclonal) was present or "no" if it was not present.

Questions 203-204: Serum free light chains – κ (kappa):

Indicate whether the serum κ (kappa) free light chain level at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." This value should reflect the quantity of serum free light chains, not a quantification of total light chains. If "known," report the value and unit of measure documented on the laboratory report in question 204 and continue with question 205. If "unknown" or "not applicable," continue with question 206. Report "not applicable" for recipients with non-secretory myeloma.

Question 205: Upper limit of normal for κ free light chain:

Indicate the upper limit of normal for κ (kappa) free light chains value and the unit of measure found on the laboratory report.

Questions 206-207: Serum free light chains – λ (lambda):

Indicate whether the serum λ (lambda) free light chain level at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." This value should reflect the quantity of serum free light

chains, not a quantification of total light chains. If "known," use question 207 to record the value and unit of measure documented on the laboratory report and continue with question 208. If "unknown" or "not applicable," continue with question 209. Report "not applicable" for recipients with non-secretory myeloma.

Question 208: Upper limit of normal for λ free light chains:

Indicate the upper limit of normal for λ (lambda) free light chains value and the unit of measure found on the laboratory report.

Questions 209-210: Urinary monoclonal protein (M-spike) / 24 hours:

Indicate whether the amount of urinary monoclonal protein at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 210. If "unknown" or "not applicable," continue with question 211. Report "not applicable" for recipients with non-secretory myeloma. Do not report immunofixation results here.

> ✳ **Urinary Monoclonal Protein**
> Questions 209-210 are intended to capture the 24-hour urine monoclonal protein results, not the 24-hour protein excretion. The results will be reported as XX g or XX g/dL. If the value is reported in XX g/dL, it should be multiplied by the volume of the urine to determine the 24-hour urine monoclonal protein. Do not report immunofixation results here.

Example:
(total in g/dL of monoclonal protein) x (total urine volume) = **urinary M-protein/24 hours**
(0.145 g/dL of monoclonal protein) x (1500 mL total urine) x (1 dL/100 mL)= **2.175 g/24 hours**

Question 211: Urinary immunofixation

Urine immunofixation is a laboratory technique that detects and types monoclonal antibodies or immunoglobulins in the urine. Indicate if the results of urinary immunofixation at the last evaluation prior to the start of the preparative regimen are "known" or "unknown." If "known," continue with question 212. If "unknown" or "not applicable," continue with question 214. Report "not applicable" for recipients with non-secretory myeloma.

Question 212: Original monoclonal bands:

Indicate "yes" if the original monoclonal band was present or "no" if it was not present.

Question 213: New monoclonal (or oligoclonal) bands:

Indicate "yes" if a new monoclonal (or oligoclonal) band was present or "no" if it was not present.

Questions 214-215: Total urine protein in 24 hours:

Indicate whether the amount of urinary protein at the last evaluation prior to the start of the preparative regimen was "known" or "unknown." The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 215. If "unknown" or "not applicable," continue with question 216. Report "not applicable" for recipients with non-secretory myeloma.

Questions 216-217: Urine albumin / creatinine ratio:

Indicate whether the urinary albumin / creatinine ratio was "known" or "unknown" at the last evaluation prior to the start of the preparative regimen. The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 217. If "unknown," continue with question 218. This question is only required if the primary disease (question 1) is MGRS or Amyloidosis or if there is evidence / history of (question 2) MGRS or Amyloidosis.

Questions 218-219: Urine protein / creatinine ratio:

Indicate whether the urinary protein / creatinine ratio was "known" or "unknown" at the last evaluation prior to the start of the preparative regimen. The value reported here should be based on a 24-hour urine collection. If "known," report the laboratory value and unit of measure documented on the laboratory report in question 219. If "unknown," continue with question 220. This question is only required if the primary disease (question 1) is MGRS or Amyloidosis or if there is evidence / history of (question 2) MGRS or Amyloidosis.

Question 220: Was minimal residual disease (MRD) assessed during the pre-HCT or pre-infusion evaluation? (report only bone marrow or blood results):

Minimal residual disease (MRD), is an indicator of increased risk for disease relapse and / or progression. MRD can be assessed by different methods including, but not limited to, next generation sequencing (NGS), Sanger sequencing, polymerase chain reaction (PCR) testing, chromosomal / genomic microarray analysis, fluorescence *in situ* hybridization (FISH), karyotyping, or flow cytometry.

Indicate if MRD was performed by next generation sequencing (NGS) or next generation flow (NGF) at the last evaluation prior to the start of the preparative regimen.

If any MRD testing was performed for patients with myeloma, answer question 220 as "yes" and continue with question 221. If no MRD testing methods were performed, report "no" and continue with question 229.

Questions 221-222: Next generation sequencing (NGS):

Indicate whether the MRD result at the last evaluation prior to the start of the preparative regimen is "positive," "negative," or "not done" by NGS testing. If "positive," report the sample source (blood or bone marrow) in question 222 and continue with question 223. If "negative" or "not done," continue with question

225.

Questions 223-224: Indicate the sensitivity of the next generation sequencing (NGS) testing:

Indicate the testing sensitivity of the NGS testing performed at the last evaluation prior to the start of the preparative regimen. If the specificity is not listed in this section, report "other" and specify the sensitivity as documented on the laboratory report in question 224.

Questions 225-226: Next generation flow (NGF):

Indicate whether the MRD result at the last evaluation prior to the start of the preparative regimen is "positive," "negative," or "not done" by NGF testing.

- If "positive," report the sample source (blood or bone marrow) in question 226 and continue with question 229
- If "negative" report the sample source (blood or bone marrow) in question 226 and continue with question 227
- If "not done," continue with question 229

Questions 227-228: Indicate the sensitivity of the next generation flow (NGF) testing:

Indicate the testing sensitivity of the NGF testing performed at the last evaluation prior to the start of the preparative regimen.

NGF testing is used to identify minimal residual disease (MRD) in patients with multiple myeloma. Some NGF reports include a "level of detection" rather than a "level of sensitivity." In these cases, the "level of sensitivity" can be derived from the level of detection. Please refer to the report and example below for further instruction.

	PERCENT	#/μL
TOTAL CELLS	100.0	8,800
% VIABLE	99.9	8,791
TOTAL PLASMA CELLS	0.002	
NORMAL PLASMA CELLS		
% OF TOTAL CELLS	0.002	0.2 cells/μL
% OF PLASMA CELLS	96.200	
NUMBER OF NORMAL PLASMA CELLS	100	
ABNORMAL PLASMA CELLS		
% OF TOTAL CELLS	0.000	0.0 cells/μL
% OF PLASMA CELLS	3.800	
NUMBER OF ATYPICAL PLASMA CELLS	4	→
LOWER LIMIT OF DETECTION (OF TOTAL CELLS)	0.001	
MAST	0.007	
HEMATOGONES	0.716	
ERYTHROBLASTS	2,945	

INTERPRETATION OF ATYPICAL PLASMA CELL NUMBER
NEGATIVE: LESS THAN 20 CELLS
EQUIVOCAL: 20 - 50 CELLS
POSITIVE: GREATER THAN 50 CELLS

Example:

- Level of Detection: 0.001 *is equal to:*
- Level of Sensitivity: 10^{-5} (1/100,000 cells) *and should be reported in question 227)*

If the specificity is not listed in this section, report "other" and specify the sensitivity as documented on the laboratory report in question 228.

Questions 229-230: Plasma cells in bone marrow aspirate by flow cytometry:

Indicate whether the percentage of plasma cells in the bone marrow aspirate assessed by flow cytometry at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." If "known," report the percentage of plasma cells in the bone marrow aspirate documented on the pathology report in question 230. If "unknown," continue with question 231.

Questions 231-232: Plasma cells in bone marrow aspirate by morphologic assessment:

> ✳ Under normal circumstances, a marrow aspirate is used to obtain the differential cell count, review morphology of the cells, and perform cytogenetic studies, flow cytometry, etc. A biopsy is obtained to evaluate the overall cellularity of the marrow. In the case of myeloma, the marrow plasma cells tend to be a patchy infiltrate rather than a diffuse infiltrate as in the case of acute leukemia. Therefore, it is possible that the plasma cell numbers may vary between the aspirate and the biopsy. For this reason, this form captures the plasma cell percentage by both methods in questions 231-234.

> ✳ • If the bone marrow pathology report states a range for plasma cells, enter the average of the range rounded to the nearest whole number (e.g., if 0-5%, enter 3%).
> • If the report states > 90% plasma cells, enter 91% on the form.
> • If the report states a marrow packed with plasma cells or sheets of plasma cells, report 99% on the form.
> • If the report states < 5% plasma cells, enter 4% on the form.

Indicate whether the percentage of plasma cells in the bone marrow aspirate was "known" or "unknown" by morphologic assessment at the last evaluation prior to the start of the preparative regimen. If "known," report the percentage of plasma cells in the bone marrow aspirate documented on the pathology report in question 232. If "unknown," continue with question 233.

Questions 233-234: Plasma cells in bone marrow biopsy:

Indicate whether the percentage of plasma cells in the bone marrow biopsy at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." If "known," report the percentage of plasma cells in the bone marrow biopsy in question 234. If "unknown," continue with question 235.

Question 235: Were cytogenetics tested (karyotyping or FISH)?

Cytogenetic analysis is the study of chromosomes. Cytogenetic assessment involves testing blood or bone marrow for the presence of a known chromosomal abnormality which reflects the recipient's disease. Testing methods you may see include conventional chromosome analysis (karyotyping) or fluorescence in situ hybridization (FISH). For more information about cytogenetic testing and terminology, see Appendix C, Cytogenetic Assessments.

Karyotyping is performed by culturing cells (growing cells under controlled conditions) until they reach the dividing phase. Techniques are then performed to visualize the chromosomes during cell division so that various bands and reconfigurations can be seen. Banding pattern differentiation and chromosomal reconfiguration demonstrate evidence of disease.

FISH is a sensitive technique that assesses a large number of cells. This technique uses special probes that recognize and bind to fragments of DNA. These probes are mixed with cells from the recipient's blood or bone marrow. A fluorescent "tag" is then used to visualize the binding of the probe to the diseased cells.

Indicate whether cytogenetic studies were tested at the last evaluation prior to the start of the preparative regimen. If cytogenetic studies were obtained, check "yes" and go to question 236. If cytogenetic studies were not obtained, or it is unknown whether chromosome studies were performed, indicate "no" or "unknown" respectively and go to question 248.

Question 236: Were cytogenetics tested via FISH?

FISH, fluorescence *in situ* hybridization, is a sensitive technique that assesses a large number of cells. This technique utilizes special probes that recognize and bind to fragments of DNA commonly found in plasma cell disorders. These probes are mixed with cells from the recipient's blood. A fluorescent "tag" is then used to visualize the binding of the probe to the diseased cells.

Indicate if FISH studies were obtained at the last evaluation prior to the start of the preparative regimen. If FISH studies were obtained, select "yes" and continue with question 237.

If no FISH studies were obtained or it is unknown if FISH studies were performed, select "no" or "unknown" and continue with question 242.

Question 237: Results of test:

If FISH studies identified abnormalities, indicate "abnormalities identified" and continue with question 238.

If there were no abnormalities identified, indicate this and continue with question 241.

> ❗ Question 238 is disabled and cannot be answered at this time.

Questions 238-240: Specify cytogenetic abnormalities (FISH):

Report the International System for Human Cytogenetic Nomenclature (ISCN) compatible string if applicable in question 238, then continue with question 239.

Specify each abnormality detected by FISH at the last evaluation prior to the start of the preparative regimen in question 239-240.

If a clonal abnormality is detected, but not listed as an option in question 239, select "other abnormality" and specify the abnormality in question 240. If multiple "Other abnormalities" were detected, report "see attachment" in question 240 and attach the final report(s) for any other abnormalities detected. For further instructions on how to attach documents in FormsNet3^{SM}, refer to the Training Guide.

Question 241: Was documentation submitted to the CIBMTR (e.g., FISH report)?

Indicate if a FISH testing report is attached to support the cytogenetic findings reported in questions 238-240. For further instructions on how to attach documents in FormsNet3^{SM}, refer to the Training Guide.

Question 242: Were cytogenetics tested via karyotyping?

Cytogenetics is the study of chromosomes. Cytogenetic assessment involves testing blood or bone marrow for the presence of a known chromosomal abnormality that reflects the recipient's disease. Cytogenetics may also be referred to as karyotyping or g-banding.

Indicate if cytogenetic studies were obtained by karyotyping at the last evaluation prior to the start of the preparative regimen. If karyotyping studies were obtained, select "yes" and continue with question 243.

If no karyotyping studies were obtained, select "no" and continue with question 248.

Question 243: Results of test:

If karyotyping studies identified abnormalities, indicate "abnormalities identified" and continue with question 244.

If karyotyping studies yielded no evaluable metaphases or there were no abnormalities identified, indicate this and continue with question 247.

> ❗ Question 244 is disabled and cannot be answered at this time.

Questions 244-246: Specify cytogenetic abnormalities (karyotyping):

Report the International System for Human Cytogenetic Nomenclature (ISCN) compatible string if applicable in question 244, then continue with question 245.

Specify each abnormality detected by karyotyping at the last evaluation prior to the start of the preparative regimen in question 245-246.

If a clonal abnormality is detected, but not listed as an option in question 245, select "other abnormality" and specify the abnormality in question 246. If multiple "Other abnormalities" were detected, report "see attachment" in question 246 and attach the final report(s) for any other abnormalities detected. For further instructions on how to attach documents in FormsNet3^{SM}, refer to the Training Guide.

Question 247: Was documentation submitted to the CIBMTR (e.g., karyotyping report)?

Indicate if a karyotyping report is attached to support the cytogenetic findings reported in questions 245-246. For further instructions on how to attach documents in FormsNet3^{SM}, refer to the Training Guide.

Question 248: Did the recipient receive dialysis?

Indicate if the recipient received dialysis prior to the start of the preparative regimen. If the recipient was on dialysis at any point within approximately 30 days prior to the start of the preparative regimen, report "yes" and continue with question 249. If the recipient did not receive dialysis within approximately 30 days prior to the start of the preparative regimen, report "no" and continue with question 256.

Questions 249-250: Date of dialysis:

Indicate if the date the recipient received dialysis was "known" or "unknown." If "known," report the date that dialysis began in question 250.. If "unknown," continue with question 251.

Question 251: Was a PET / CT scan performed?

A PET / CT combines the results of the PET (Positron Emission Tomography) scan along with the results of a CT (Computed Tomography) scan. If a PET / CT scan was performed at the last evaluation prior to the start of the p reparative regimen, indicate "yes" and continue with question 252. If a PET / CT scan was not performed, select "no" and continue with question 256.

Questions 252-253: Was the PET / CT scan positive for myeloma involvement at any disease site?

Indicate if the PET / CT scan was positive for myeloma involvement at any disease site. If positive at any site, report "yes" for question 252 and specify which area(s) show involvement in question 253. If negative, report "no" and continue with question 254.

Questions 254-255: Date of PET / CT scan:

Indicate if the date of the PET / CT scan was "known" or "unknown" at the last evaluation prior to the start of the preparative regimen. If "known," report the assessment date in question 255. If "unknown," continue with question 256.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Q256-290: Amyloidosis Organ Involvement at Last Evaluation Prior to the Start of the Preparative Regimen

> ❗ Complete questions 256-290 for amyloidosis patients only. If amyloidosis was not reported as the primary disease for transplant (question 1) or as a preceding / concurrent disorder (question 2), skip to question 291.

Question 256: Was the left ventricular ejection fraction measured?

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). Indicate if the left ventricular ejection fraction (LVEF) was measured at the last evaluation prior to the start of the preparative regimen. If "yes," continue with question 257. If "no," continue with question 259.

Question 257: Specify results of left ventricular fraction:

Indicate the left ventricular ejection fraction at the last evaluation prior to the start of the preparative regimen. Most imaging reports will report the LVEF. If the LVEF is not explicitly documented it should be determined by dividing the stroke volume (SV, the volume of blood pumped into the aorta from the left ventricle) by the end diastolic volume (EDV, the volume of blood in the left ventricle just prior to contraction) of the left ventricle. For example, if the stroke volume was 75 ml and the end diastolic volume was 150 ml, the ejection fraction would be 50%.

Question 258: Specify the method used to determine the left ventricular ejection fraction:

Indicate the method used to determine the LVEF reported in question 258.

Question 259: Was diastolic dysfunction present?

Diastole is the period in which chambers of the heart fill with blood. Diastolic dysfunction may be characterized by the difficulty of the ventricles to expand and contract appropriately due to stiffening of the heart walls by amyloid deposits. Indicate if diastolic dysfunction was present at the last evaluation prior to the start of the preparative regimen. Specify "yes," "no," or "unknown," and continue with question 260.

Questions 260-261: Specify the intraventricular septal wall thickness measured by echocardiogram:

The heart is divided into the right and left sides by the septum. The area between the left and right ventricles is the intraventricular septum. Indicate if the intraventricular septal thickness is "known" or "unknown." If "known," based on evaluation by echocardiogram, indicate the thickness of the intraventricular septal wall in question 261. If "unknown" or not measured by echocardiogram, continue with question 262.

Questions 262-263: Specify left ventricular (LV) strain percentage:

A strain pattern, as determined by electrocardiography, is a well-recognized marker of hypertrophy of the left ventricular (LVH) and is characterized by ST depression and T wave inversion on a resting ECG / EKG. The LV strain percentage is typically a negative percentage. The normal range for the LV global longitudinal strain (LV GLS) is -15.9% to -22.1%. Indicate if the left ventricular strain percentage is "known" or "unknown." If "known," based on evaluation by electrocardiogram, indicate the strain percentage in question 263. If "unknown," or not measured by electrocardiogram, continue with question 264.

Questions 264-265: Were any serum cardiac biomarkers assessed?

Assessment of cardiac biomarkers helps determine if injury to cardiac tissue has occurred. Cardiac biomarkers include brain natriuretic peptide (BNP), N-terminal prohormone brain natriuretic peptide (NT-proBNP), Troponin I, and Troponin T. Indicate if serum cardiac biomarkers were assessed at the last evaluation prior to the start of the preparative regimen. If "yes," report the date assessed in question 265. If "no" or "unknown" continue with question 281.

Questions 266-267: Brain natriuretic peptide (BNP):

Indicate if the BNP was assessed at the last evaluation prior to the start of the preparative regimen. If "yes," report the value (in pg/mL) in question 267 and continue with question 268. If "no," continue with question 269.

Question 268: Upper limit of normal for BNP:

Indicate the upper limit of normal for BNP (in pg/mL) found on the laboratory report.

Questions 269-270: N-terminal prohormone brain natriuretic peptide (NT-proBNP):

Indicate if the NT-proBNP was assessed at the last evaluation prior to the start of the preparative regimen. If "yes," report the value (in pg/mL) in question 270 and continue with question 271. If "no," continue with question 272.

Question 271: Upper limit of normal for NT-proBNP:

Indicate the upper limit of normal (in pg/mL) for NT-proBNP found on the laboratory report.

Questions 272-273: Troponin I:

Indicate if the Troponin I was assessed at the last evaluation prior to the start of the preparative regimen. If "yes," report the value (in µg/L) in question 273 and continue with question 274. If "no," continue with question 275.

Question 274: Upper limit of normal for troponin I:

Indicate the upper limit of normal (in µg/L) for Troponin I found on the laboratory report.

Questions 275-276: Troponin T:

Indicate if the Troponin T was assessed at the last evaluation prior to the start of the preparative regimen. If "yes," report the value (in µg/L) in question 276 and continue with question 277. If "no," continue with question 278.

Question 277: Upper limit of normal for Troponin T:

Indicate the upper limit of normal (in µg/L) for Troponin T found on the laboratory report.

Questions 278-279: High-sensitivity troponin T:

Indicate if the high-sensitivity troponin T was assessed at the last evaluation prior to the start of the preparative regimen. If "yes," report the value (in ng/L) in question 279 and continue with question 280. If "no," continue with question 281.

Question 280: Upper limit of normal for high-sensitivity troponin T:

Indicate the upper limit of normal (in ng/L) for high-sensitivity troponin T found on the laboratory report.

Questions 281-282: 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 the last evaluation prior to the start of the preparative regimen. If "yes," report the total distance walked and specify the unit of measure in question 282. If "no," continue with question 283.

Question 283: Specify the recipient's New York Heart Association functional classification of heart failure: (Symptoms may include dyspnea, chest pain, fatigue, and palpitations; activity level should be assessed with consideration for patient's age group)

Indicate the recipient's New York Heart Association functional classification at the last evaluation prior to the start of the preparative regimen using the following guidelines:

- Class I – Able to perform ordinary activities without symptoms; no limitation of physical activity
- Class II – Ordinary physical activity produces symptoms; slight limitation of physical activity
- Class III – Less-than-ordinary physical activity produces symptoms; moderate limitation of physical activity
- Class IV – Symptoms present even at rest; severe limitation of physical activity

If the recipient's NYHA functional classification it not known, select "unknown."

Question 284: Recipient blood pressure:

Indicate if the recipient's blood pressure was assessed at the last evaluation prior to the start of the preparative regimen. If "known," continue with question 285. If "unknown," continue with question 287.

Questions 285-286: Recipient blood pressure results:

Report the recipient's blood pressure at the last evaluation prior to the start of the preparative regimen in question 285 and indicate in which body position the measurement was taken in question 286.

Question 287: Was hepatomegaly present on radiographic imaging (liver span > 15 cm) or on examination (liver edge palpable > 3 cm below right costal margin)?

At the last evaluation prior to the start of the preparative regimen, indicate if the liver spanned more than 15 cm (by radiographic imaging) or the edge of the liver was palpable more than 3 cm below the right costal margin (by physical examination). Indicate "yes" if hepatomegaly was present. Indicate "no" if hepatomegaly was not present. Indicate "unknown" if it was not possible to determine the presence or absence of hepatomegaly.

Questions 288-289: Specify the level of serum alkaline phosphatase:

Indicate whether the alkaline phosphatase (ALP) level at the last evaluation prior to the start of the preparative regimen is "known" or "unknown." If "known," report the laboratory count and unit of measure documented on the laboratory report in question 289 and continue with question 290. If "unknown," continue with question 291.

Question 290: Upper limit of normal for alkaline phosphatase:

Report the upper limit of normal for ALP found on the laboratory report.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Last modified: Dec 22, 2020

Q291-296: POEMS Syndrome Assessment at Last Evaluation Prior to the Start of the Preparative Regimen / Infusion

> **!** Complete questions 291-296 for POEMS patients only. If POEMS was not reported as the primary disease for transplant (question 1) or as a preceding / concurrent disorder (question 2), submit the form.

Questions 291-292: Vascular endothelial growth factor (VEGF) serum value:

Vascular endothelial growth factor (VEGF) promotes the growth of new blood vessels and acts as a signaling protein influencing the rate at which this process is performed. Indicate whether the serum-derived vascular endothelial growth factor (VEGF) value was "known" or "unknown" at the last evaluation prior to the start of the preparative regimen. If "known," report the value (in pg/mL) in question 292 and continue with question 293. If "unknown," continue with question 294.

Question 293: Upper limit of normal for vascular endothelial growth factor (VEGF) serum value:

Indicate the upper limit of normal for serum-derived vascular endothelial growth factor (VEGF) value (in pg/mL) found on the laboratory report.

Questions 294-295: Vascular endothelial growth factor (VEGF) plasma value:

Vascular endothelial growth factor (VEGF) promotes the growth of new blood vessels and acts as a signaling protein influencing the rate at which this process is performed. Indicate whether the plasma-derived vascular endothelial growth factor (VEGF) value was "known" or "unknown" at the last evaluation prior to the start of the preparative regimen. If "known," report the value (in pg/mL) in question 295 and continue with question 296. If "unknown," continue with First Name.

Question 296: Upper limit of normal for vascular endothelial growth factor (VEGF) plasma value:

Indicate the upper limit of normal for plasma-derived vascular endothelial growth factor (VEGF) value (in pg/mL) found on the laboratory report.

Section Updates:

Question Number	Date of Change	Add/Remove/Modify	Description	Reasoning (If applicable)
.	.	.	.	.

Last modified: Dec 22, 2020