1. Date of echocardiography:
2. Echo manufacturer:
3. Echo model:
4. Parasternal short axis view analysis

| Left Ventricle | Anterior | Anterolateral | Inferolateral | Inferior | Inferoseptal | Anteroseptal |
| --- | --- | --- | --- | --- | --- | --- |
| 1. Circumferential strain | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site |
| 1. Radial strain | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site |

1. Apical view analyses

Global strain

| Four chamber view | Two chamber view | Long axis view (three chamber) |
| --- | --- | --- |
| Data to be filled in by site | Data to be filled in by site | Data to be filled in by site |

Segmental strain—four-chamber view

| Basal inferoseptum | Mid inferoseptum | Apical septum | Basal anterolateral | Mid anterolateral | Apical lateral |
| --- | --- | --- | --- | --- | --- |
| Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site |

Segmental strain—two-chamber view

| Basal inferior | Mid inferior | Apical inferior | Basal anterior | Mid anterior | Apical anterior |
| --- | --- | --- | --- | --- | --- |
| Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site |

Segmental strain—long axis view (three chamber)

| Basal inferolateral | Mid inferolateral | Apical lateral | Basal anteroseptum | Mid anteroseptum | Apical anterior |
| --- | --- | --- | --- | --- | --- |
| Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site | Data to be filled in by site |

Recorder Signature: Date:

## General Instructions

This form contains data elements that are collected to measure myocardial segmental and global contractility.

Important note: None of the data elements included on this CRF Module are classified as Core (i.e., strongly recommended for all mitochondrial disease clinical studies to collect). All of the data elements are classified as Exploratory and should only be collected if the research team considers them appropriate for their study.

Please see the Data Dictionary for element classifications.

## Specific Instructions

Date/time should be recorded to the level of granularity known (e.g., year, year and month, complete date plus hours and minutes, etc.) and in an unambiguous format acceptable to the study database like DD-MMM-YYYY. When date/time data are prepared for aggregation or sharing, they should be converted to the format specified by [ISO 8601](https://www.iso.org/iso-8601-date-and-time-format.html);  YYYY-MM-DD T:hh:mm:ss.

Frame rates between 40 to 80 frames/sec are generally recommended, however higher frame rates are advisable to avoid undersampling in tachycardia.

The focus should be positioned at an intermediate depth to optimize the images for 2D STE, and sector depth and width should be adjusted to include as little as possible outside the region of interest.

Any artifact that resembles speckle patterns will influence the quality of speckle tracking, and thus care should be taken to avoid these.

For software packages that process single beats, data sampling should start 100 msec before the peak R wave of the first QRS complex and end 200 msec after the last QRS to allow correct identification of the QRS complex, because failure to do so may result in erroneous drift compensation.

Apical foreshortening seriously affects the results of 2D STE and should therefore be minimized.

The short-axis cuts of the left ventricle should be circular shaped to assess the deformation in the anatomically correct circumferential and radial directions.

## Reference

Lang RM, Badano LP, Mor-Avi V, Afilalo J, Armstrong A, Ernande L, Flachskampf FA, Foster E, Goldstein SA, Kuznetsova T, Lancellotti P, Muraru D, Picard MH, Rietzschel ER, Rudski L, Spencer KT, Tsang W, Voigt JU. Recommendations for cardiac chamber quantification by echocardiography in adults: an update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. Eur Heart J Cardiovasc Imaging. 2015 Mar;16(3):233-70. Erratum in: Eur Heart J Cardiovasc Imaging. 2016 Apr;17(4):412. Erratum in: Eur Heart J Cardiovasc Imaging. 2016 Sep;17 (9):969.

Mor-Avi V, Lang RM, Badano LP, Belohlavek M, Cardim NM, Derumeaux G, Galderisi M, Marwick T, Nagueh SF, Sengupta PP, Sicari R, Smiseth OA, Smulevitz B, Takeuchi M, Thomas JD, Vannan M, Voigt JU, Zamorano JL. Current and evolving echocardiographic techniques for the quantitative evaluation of cardiac mechanics: ASE/EAE consensus statement on methodology and indications endorsed by the Japanese Society of Echocardiography. J Am Soc Echocardiogr. 2011 Mar;24(3):277-313.

Voigt JU, Pedrizzetti G, Lysyansky P, Marwick TH, Houle H, Baumann R, Pedri S, Ito Y, Abe Y, Metz S, Song JH, Hamilton J, Sengupta PP, Kolias TJ, d'Hooge J, Aurigemma GP, Thomas JD, Badano LP. Definitions for a common standard for 2D speckle tracking echocardiography: consensus document of the EACVI/ASE/Industry Task Force to standardize deformation imaging. J Am Soc Echocardiogr. 2015 Feb;28(2):183-93.