

|                   |
|-------------------|
| Table of contents |
|-------------------|

\\USER

2019\_MBC\_PROTOCOLS\_VE11C

SB.2002.60 MR DEVELOPMENT - RS

SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111

|                             |   |
|-----------------------------|---|
| localizer                   | * |
| gre_field_mapping           | * |
| t1_fl2d_sag                 | * |
| t2_tse_tra_p2               | * |
| t1_mp2rage                  | * |
| t2s_megre                   | * |
| ep2d_se_ap                  | * |
| ep2d_se_pa                  | * |
| ep2d_fid_basic_bold_p2_task | * |
| ep2d_se_ap                  | * |
| ep2d_se_pa                  | * |
| ep2d_fid_basic_bold_p2_rest | * |
| cmrr_ep2d_se_ap             | * |
| cmrr_ep2d_se_apinvrope      | * |
| cmrr_mbep2d_diff            | * |
| pasl_3d_tra                 | * |
| csi_slaser                  | * |

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\localizer \***

TA: 0:10 PM: REF Voxel size: 0.5×0.5×7.0 mmPAT: Off Rel. SNR: 1.00 : fl

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | On                 |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | On                 |
| Load images to graphic segments               | On                 |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Reconstruction  | Magnitude        |
| Measurements    | 1                |
| Multiple series | Each measurement |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 250 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 7.0 mm  |
| Base resolution       | 256     |
| Phase resolution      | 91 %    |
| Phase partial Fourier | Off     |
| Interpolation         | On      |

### Routine

|                    |                                      |
|--------------------|--------------------------------------|
| Slice group        | 1                                    |
| Slices             | 1                                    |
| Dist. factor       | 20 %                                 |
| Position           | L0.0 A20.0 H0.0 mm                   |
| Orientation        | Sagittal                             |
| Phase enc. dir.    | A >> P                               |
| Slice group        | 2                                    |
| Slices             | 1                                    |
| Dist. factor       | 20 %                                 |
| Position           | L0.0 A20.0 H0.0 mm                   |
| Orientation        | Transversal                          |
| Phase enc. dir.    | A >> P                               |
| Slice group        | 3                                    |
| Slices             | 1                                    |
| Dist. factor       | 20 %                                 |
| Position           | L0.0 A20.0 H0.0 mm                   |
| Orientation        | Coronal                              |
| Phase enc. dir.    | R >> L                               |
| AutoAlign          | ---                                  |
| Phase oversampling | 0 %                                  |
| FoV read           | 250 mm                               |
| FoV phase          | 100.0 %                              |
| Slice thickness    | 7.0 mm                               |
| TR                 | 7.5 ms                               |
| TE                 | 3.69 ms                              |
| Averages           | 2                                    |
| Concatenations     | 3                                    |
| Filter             | Prescan Normalize, Elliptical filter |
| Coil elements      | HE1-4                                |

### Resolution - iPAT

|          |      |
|----------|------|
| PAT mode | None |
|----------|------|

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Image Filter      | Off |
| Distortion Corr.  | Off |
| Prescan Normalize | On  |
| Unfiltered images | Off |
| Normalize         | Off |
| B1 filter         | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | On  |

### Geometry - Common

|                  |                    |
|------------------|--------------------|
| Slice group      | 1                  |
| Slices           | 1                  |
| Dist. factor     | 20 %               |
| Position         | L0.0 A20.0 H0.0 mm |
| Orientation      | Sagittal           |
| Phase enc. dir.  | A >> P             |
| Slice group      | 2                  |
| Slices           | 1                  |
| Dist. factor     | 20 %               |
| Position         | L0.0 A20.0 H0.0 mm |
| Orientation      | Transversal        |
| Phase enc. dir.  | A >> P             |
| Slice group      | 3                  |
| Slices           | 1                  |
| Dist. factor     | 20 %               |
| Position         | L0.0 A20.0 H0.0 mm |
| Orientation      | Coronal            |
| Phase enc. dir.  | R >> L             |
| FoV read         | 250 mm             |
| FoV phase        | 100.0 %            |
| Slice thickness  | 7.0 mm             |
| TR               | 7.5 ms             |
| Multi-slice mode | Sequential         |
| Series           | Interleaved        |
| Concatenations   | 3                  |

### Contrast - Common

|                   |         |
|-------------------|---------|
| TR                | 7.5 ms  |
| TE                | 3.69 ms |
| TD                | 0 ms    |
| MTC               | Off     |
| Magn. preparation | None    |
| Flip angle        | 20 deg  |
| Fat suppr.        | None    |
| Water suppr.      | None    |
| SWI               | Off     |

### Contrast - Dynamic

|                |            |
|----------------|------------|
| Averages       | 2          |
| Averaging mode | Short term |

### Geometry - AutoAlign

|             |                    |
|-------------|--------------------|
| Slice group | 1                  |
| Position    | L0.0 A20.0 H0.0 mm |

**Geometry - AutoAlign**

|                     |                    |
|---------------------|--------------------|
| Orientation         | Sagittal           |
| Phase enc. dir.     | A >> P             |
| Slice group         | 2                  |
| Position            | L0.0 A20.0 H0.0 mm |
| Orientation         | Transversal        |
| Phase enc. dir.     | A >> P             |
| Slice group         | 3                  |
| Position            | L0.0 A20.0 H0.0 mm |
| Orientation         | Coronal            |
| Phase enc. dir.     | R >> L             |
| AutoAlign           | ---                |
| Initial Position    | L0.0 A20.0 H0.0    |
| L                   | 0.0 mm             |
| A                   | 20.0 mm            |
| H                   | 0.0 mm             |
| Initial Rotation    | 0.00 deg           |
| Initial Orientation | Sagittal           |

**Geometry - Saturation**

|                 |          |
|-----------------|----------|
| Saturation mode | Standard |
| Fat suppr.      | None     |
| Water suppr.    | None     |
| Special sat.    | None     |

**System - Miscellaneous**

|                     |                      |
|---------------------|----------------------|
| Positioning mode    | REF                  |
| Table position      | H                    |
| Table position      | 0 mm                 |
| MSMA                | S - C - T            |
| Sagittal            | R >> L               |
| Coronal             | A >> P               |
| Transversal         | F >> H               |
| Coil Combine Mode   | Adaptive Combine     |
| Save uncombined     | Off                  |
| Matrix Optimization | Off                  |
| AutoAlign           | ---                  |
| Coil Select Mode    | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Tune up  |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 263 mm      |
| R >> L      | 350 mm      |
| F >> H      | 350 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |            |
|--------------|------------|
| B1 Shim mode | TrueForm   |
| Excitation   | Slice-sel. |

**System - Tx/Rx**

|                   |                |
|-------------------|----------------|
| Frequency 1H      | 123.237781 MHz |
| Correction factor | 1              |
| Gain              | High           |

**System - Tx/Rx**

|                     |         |
|---------------------|---------|
| Img. Scale Cor.     | 1.000   |
| Reset               | Off     |
| ? Ref. amplitude 1H | 0.000 V |

**Physio - Signal1**

|                 |        |
|-----------------|--------|
| 1st Signal/Mode | None   |
| TR              | 7.5 ms |
| Concatenations  | 3      |
| Segments        | 1      |

**Physio - Cardiac**

|                   |         |
|-------------------|---------|
| Magn. preparation | None    |
| Fat suppr.        | None    |
| Dark blood        | Off     |
| FoV read          | 250 mm  |
| FoV phase         | 100.0 % |
| Phase resolution  | 91 %    |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 3   |

**Inline - Common**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Liver registration   | Off |
| Save original images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP-Sag              | Off |
| MIP-Cor              | Off |
| MIP-Tra              | Off |
| MIP-Time             | Off |
| Save original images | On  |

**Inline - Soft Tissue**

|              |     |
|--------------|-----|
| Wash - In    | Off |
| Wash - Out   | Off |
| TTP          | Off |
| PEI          | Off |
| MIP - time   | Off |
| Measurements | 1   |

**Inline - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Inline - MapIt**

|                      |         |
|----------------------|---------|
| Save original images | On      |
| MapIt                | None    |
| Flip angle           | 20 deg  |
| Measurements         | 1       |
| Contrasts            | 1       |
| TR                   | 7.5 ms  |
| TE                   | 3.69 ms |

**Sequence - Part 1**

|                     |         |
|---------------------|---------|
| Introduction        | Off     |
| Dimension           | 2D      |
| Phase stabilisation | Off     |
| Asymmetric echo     | Allowed |
| Contrasts           | 1       |
| Flow comp.          | No      |

**Sequence - Part 1**

|                  |            |
|------------------|------------|
| Multi-slice mode | Sequential |
| Bandwidth        | 320 Hz/Px  |

**Sequence - Part 2**

|                          |            |
|--------------------------|------------|
| Segments                 | 1          |
| Acoustic noise reduction | None       |
| RF pulse type            | Fast       |
| Gradient mode            | Fast       |
| Excitation               | Slice-sel. |
| RF spoiling              | On         |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| Mode          | Off |
| Allowed delay | 0 s |

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\gre\_field\_mapping \***

TA: 0:26 PM: REF Voxel size: 3.0×3.0×6.0 mmRel. SNR: 1.00 : fm\_r

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |             |
|--------------------|-------------|
| Slice group        | 1           |
| Slices             | 18          |
| Dist. factor       | 25 %        |
| Position           | Isocenter   |
| Orientation        | Transversal |
| Phase enc. dir.    | R >> L      |
| AutoAlign          | ---         |
| Phase oversampling | 0 %         |
| FoV read           | 192 mm      |
| FoV phase          | 100.0 %     |
| Slice thickness    | 6.0 mm      |
| TR                 | 200.0 ms    |
| TE 1               | 4.92 ms     |
| TE 2               | 7.38 ms     |
| Averages           | 1           |
| Concatenations     | 1           |
| Filter             | None        |
| Coil elements      | HE1-4       |

### Contrast - Common

|            |          |
|------------|----------|
| TR         | 200.0 ms |
| TE 1       | 4.92 ms  |
| TE 2       | 7.38 ms  |
| MTC        | Off      |
| Flip angle | 60 deg   |
| Fat suppr. | None     |

### Contrast - Dynamic

|                 |           |
|-----------------|-----------|
| Averages        | 1         |
| Averaging mode  | Long term |
| Reconstruction  | Phase     |
| Measurements    | 1         |
| Multiple series | Off       |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 6.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | Off     |

### Resolution - Filter Image

|              |     |
|--------------|-----|
| Image Filter | Off |
|--------------|-----|

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Distortion Corr.  | Off |
| Prescan Normalize | Off |
| Normalize         | Off |
| B1 filter         | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 18          |
| Dist. factor     | 25 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | R >> L      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 6.0 mm      |
| TR               | 200.0 ms    |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | R >> L      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 90.00 deg   |
| Initial Orientation | Transversal |

### Geometry - Saturation

|              |      |
|--------------|------|
| Fat suppr.   | None |
| Special sat. | None |

### System - Miscellaneous

|                     |                      |
|---------------------|----------------------|
| Positioning mode    | REF                  |
| Table position      | H                    |
| Table position      | 0 mm                 |
| MSMA                | S - C - T            |
| Sagittal            | R >> L               |
| Coronal             | A >> P               |
| Transversal         | F >> H               |
| Coil Combine Mode   | Sum of Squares       |
| Save uncombined     | Off                  |
| Matrix Optimization | Off                  |
| AutoAlign           | ---                  |
| Coil Select Mode    | Off - AutoCoilSelect |

### System - Adjustments

|                       |          |
|-----------------------|----------|
| B0 Shim mode          | Standard |
| B1 Shim mode          | TrueForm |
| Adjust with body coil | Off      |

**System - Adjustments**

|                          |      |
|--------------------------|------|
| Confirm freq. adjustment | Off  |
| Assume Dominant Fat      | Off  |
| Assume Silicone          | Off  |
| Adjustment Tolerance     | Auto |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 90.00 deg   |
| R >> L      | 192 mm      |
| A >> P      | 192 mm      |
| F >> H      | 134 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
|--------------|----------|

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Sequence - Part 1**

|                  |             |
|------------------|-------------|
| Introduction     | Off         |
| Dimension        | 2D          |
| Asymmetric echo  | Off         |
| Contrasts        | 2           |
| Flow comp.       | Yes         |
| Multi-slice mode | Interleaved |
| Bandwidth        | 290 Hz/Px   |

**Sequence - Part 2**

|               |        |
|---------------|--------|
| RF pulse type | Normal |
| Gradient mode | Fast   |
| RF spoiling   | On     |

**Sequence - Assistant**

|      |     |
|------|-----|
| Mode | Off |
|------|-----|

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\1t1\_fl2d\_sag \***

TA: 0:17 PM: REF Voxel size: 1.4×1.4×6.0 mmPAT: Off Rel. SNR: 1.00 : fl

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | On                 |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |   |
|--------------------|---|
| Slice group        | 1                                       |
| Slices             | 12                                      |
| Dist. factor       | 30 %                                    |
| Position           | Isocenter                               |
| Orientation        | Sagittal                                |
| Phase enc. dir.    | A >> P                                  |
| AutoAlign          | Head > Basis                            |
| Phase oversampling | 30 %                                    |
| FoV read           | 220 mm                                  |
| FoV phase          | 100.0 %                                 |
| Slice thickness    | 6.0 mm                                  |
| TR                 | 100.0 ms                                |
| TE                 | 2.46 ms                                 |
| Averages           | 1                                       |
| Concatenations     | 1                                       |
| Filter             | Prescan Normalize,<br>Elliptical filter |
| Coil elements      | HE1-4                                   |

### Contrast - Common

|                   |          |
|-------------------|----------|
| TR                | 100.0 ms |
| TE                | 2.46 ms  |
| MTC               | Off      |
| Magn. preparation | None     |
| Flip angle        | 70 deg   |
| Fat suppr.        | None     |
| Water suppr.      | None     |
| SWI               | Off      |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Averages        | 1                |
| Averaging mode  | Long term        |
| Reconstruction  | Magnitude        |
| Measurements    | 1                |
| Multiple series | Each measurement |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 220 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 6.0 mm  |
| Base resolution       | 160     |
| Phase resolution      | 80 %    |
| Phase partial Fourier | Off     |
| Interpolation         | Off     |

### Resolution - iPAT

|          |      |
|----------|------|
| PAT mode | None |
|----------|------|

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Image Filter      | Off |
| Distortion Corr.  | Off |
| Prescan Normalize | On  |
| Unfiltered images | Off |
| Normalize         | Off |
| B1 filter         | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | On  |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 12          |
| Dist. factor     | 30 %        |
| Position         | Isocenter   |
| Orientation      | Sagittal    |
| Phase enc. dir.  | A >> P      |
| FoV read         | 220 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 6.0 mm      |
| TR               | 100.0 ms    |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |              |
|---------------------|--------------|
| Slice group         | 1            |
| Position            | Isocenter    |
| Orientation         | Sagittal     |
| Phase enc. dir.     | A >> P       |
| AutoAlign           | Head > Basis |
| Initial Position    | Isocenter    |
| L                   | 0.0 mm       |
| P                   | 0.0 mm       |
| H                   | 0.0 mm       |
| Initial Rotation    | 0.00 deg     |
| Initial Orientation | Sagittal     |

### Geometry - Saturation

|                 |          |
|-----------------|----------|
| Saturation mode | Standard |
| Fat suppr.      | None     |
| Water suppr.    | None     |
| Special sat.    | None     |

### System - Miscellaneous

|                     |                  |
|---------------------|------------------|
| Positioning mode    | REF              |
| Table position      | H                |
| Table position      | 0 mm             |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combine Mode   | Adaptive Combine |
| Save uncombined     | Off              |
| Matrix Optimization | Off              |

**System - Miscellaneous**

|                  |                      |
|------------------|----------------------|
| AutoAlign        | Head > Basis         |
| Coil Select Mode | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Tune up  |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 263 mm      |
| R >> L      | 350 mm      |
| F >> H      | 350 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |            |
|--------------|------------|
| B1 Shim mode | TrueForm   |
| Excitation   | Slice-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |          |
|-----------------|----------|
| 1st Signal/Mode | None     |
| TR              | 100.0 ms |
| Concatenations  | 1        |
| Segments        | 1        |

**Physio - Cardiac**

|                   |         |
|-------------------|---------|
| Magn. preparation | None    |
| Fat suppr.        | None    |
| Dark blood        | Off     |
| FoV read          | 220 mm  |
| FoV phase         | 100.0 % |
| Phase resolution  | 80 %    |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Inline - Common**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Liver registration   | Off |
| Save original images | On  |

**Inline - MIP**

|          |     |
|----------|-----|
| MIP-Sag  | Off |
| MIP-Cor  | Off |
| MIP-Tra  | Off |
| MIP-Time | Off |

**Inline - MIP**

|                      |    |
|----------------------|----|
| Save original images | On |
|----------------------|----|

**Inline - Soft Tissue**

|              |     |
|--------------|-----|
| Wash - In    | Off |
| Wash - Out   | Off |
| TTP          | Off |
| PEI          | Off |
| MIP - time   | Off |
| Measurements | 1   |

**Inline - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Inline - MapIt**

|                      |          |
|----------------------|----------|
| Save original images | On       |
| MapIt                | None     |
| Flip angle           | 70 deg   |
| Measurements         | 1        |
| Contrasts            | 1        |
| TR                   | 100.0 ms |
| TE                   | 2.46 ms  |

**Sequence - Part 1**

|                     |             |
|---------------------|-------------|
| Introduction        | Off         |
| Dimension           | 2D          |
| Phase stabilisation | Off         |
| Asymmetric echo     | Allowed     |
| Contrasts           | 1           |
| Flow comp.          | No          |
| Multi-slice mode    | Interleaved |
| Bandwidth           | 320 Hz/Px   |

**Sequence - Part 2**

|                          |             |
|--------------------------|-------------|
| Segments                 | 1           |
| Acoustic noise reduction | None        |
| RF pulse type            | Fast        |
| Gradient mode            | Performance |
| Excitation               | Slice-sel.  |
| RF spoiling              | On          |

**Sequence - Assistant**

|               |          |
|---------------|----------|
| Mode          | TR       |
| Max. TR       | 550.0 ms |
| Allowed delay | 60 s     |



**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\t2\_tse\_tra\_p2 \***

TA: 0:14 PM: REF Voxel size: 0.9×0.9×6.0 mmPAT: 2 Rel. SNR: 1.00 : tse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | On                 |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Resolution - iPAT

|                     |            |
|---------------------|------------|
| PAT mode            | GRAPPA     |
| Accel. factor PE    | 2          |
| Ref. lines PE       | 38         |
| Reference scan mode | Integrated |

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Image Filter      | Off |
| Distortion Corr.  | Off |
| Prescan Normalize | On  |
| Unfiltered images | Off |
| Normalize         | Off |
| B1 filter         | Off |

### Routine

|                    |                   |
|--------------------|-------------------|
| Slice group        | 1                 |
| Slices             | 12                |
| Dist. factor       | 30 %              |
| Position           | Isocenter         |
| Orientation        | Transversal       |
| Phase enc. dir.    | R >> L            |
| AutoAlign          | Head > Brain      |
| Phase oversampling | 30 %              |
| FoV read           | 220 mm            |
| FoV phase          | 100.0 %           |
| Slice thickness    | 6.0 mm            |
| TR                 | 2000.0 ms         |
| TE                 | 26.0 ms           |
| Averages           | 1                 |
| Concatenations     | 1                 |
| Filter             | Prescan Normalize |
| Coil elements      | HE1-4             |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 12          |
| Dist. factor     | 30 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | R >> L      |
| FoV read         | 220 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 6.0 mm      |
| TR               | 2000.0 ms   |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Contrast - Common

|                   |           |
|-------------------|-----------|
| TR                | 2000.0 ms |
| TE                | 26.0 ms   |
| MTC               | Off       |
| Magn. preparation | None      |
| Flip angle        | 150 deg   |
| Fat suppr.        | None      |
| Water suppr.      | None      |
| Restore magn.     | Off       |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Averages        | 1                |
| Averaging mode  | Long term        |
| Reconstruction  | Magnitude        |
| Measurements    | 1                |
| Multiple series | Each measurement |

### Resolution - Common

|                       |           |
|-----------------------|-----------|
| FoV read              | 220 mm    |
| FoV phase             | 100.0 %   |
| Slice thickness       | 6.0 mm    |
| Base resolution       | 128       |
| Phase resolution      | 100 %     |
| Phase partial Fourier | Off       |
| Trajectory            | Cartesian |
| Interpolation         | On        |

### Geometry - AutoAlign

|                     |              |
|---------------------|--------------|
| Slice group         | 1            |
| Position            | Isocenter    |
| Orientation         | Transversal  |
| Phase enc. dir.     | R >> L       |
| AutoAlign           | Head > Brain |
| Initial Position    | Isocenter    |
| L                   | 0.0 mm       |
| P                   | 0.0 mm       |
| H                   | 0.0 mm       |
| Initial Rotation    | 90.00 deg    |
| Initial Orientation | Transversal  |

### Geometry - Saturation

|               |      |
|---------------|------|
| Fat suppr.    | None |
| Water suppr.  | None |
| Restore magn. | Off  |
| Special sat.  | None |

### Geometry - Navigator

### System - Miscellaneous

|                  |           |
|------------------|-----------|
| Positioning mode | REF       |
| Table position   | H         |
| Table position   | 0 mm      |
| MSMA             | S - C - T |

**System - Miscellaneous**

|                     |                      |
|---------------------|----------------------|
| Sagittal            | R >> L               |
| Coronal             | A >> P               |
| Transversal         | F >> H               |
| Coil Combine Mode   | Adaptive Combine     |
| Save uncombined     | Off                  |
| Matrix Optimization | Off                  |
| AutoAlign           | Head > Brain         |
| Coil Select Mode    | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Tune up  |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 263 mm      |
| R >> L      | 350 mm      |
| F >> H      | 350 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
|--------------|----------|

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 2000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                   |           |
|-------------------|-----------|
| Magn. preparation | None      |
| Fat suppr.        | None      |
| Dark blood        | Off       |
| FoV read          | 220 mm    |
| FoV phase         | 100.0 %   |
| Phase resolution  | 100 %     |
| Trajectory        | Cartesian |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Inline - Common**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save original images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP-Sag              | Off |
| MIP-Cor              | Off |
| MIP-Tra              | Off |
| MIP-Time             | Off |
| Save original images | On  |

**Inline - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                     |             |
|---------------------|-------------|
| Introduction        | Off         |
| Dimension           | 2D          |
| Compensate T2 decay | Off         |
| Reduce Motion Sens. | Off         |
| Contrasts           | 1           |
| Flow comp.          | No          |
| Multi-slice mode    | Interleaved |
| Free echo spacing   | Off         |
| Echo spacing        | 8.82 ms     |
| Bandwidth           | 219 Hz/Px   |

**Sequence - Part 2**

|                          |              |
|--------------------------|--------------|
| Define                   | Turbo factor |
| Echo trains per slice    | 6            |
| Phase correction         | Automatic    |
| Acoustic noise reduction | None         |
| RF pulse type            | Normal       |
| Gradient mode            | Normal       |
| Hyperecho                | Off          |
| WARP                     | Off          |
| Red. EC sensitivity      | Off          |
| Turbo factor             | 17           |

**Sequence - Assistant**

|               |           |
|---------------|-----------|
| Mode          | TR        |
| Max. TR       | 7500.0 ms |
| Allowed delay | 60 s      |

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\t1\_mp2rage \***

TA: 0:24 PM: REF Voxel size: 1.1×1.1×5.0 mmPAT: 1.0 Rel. SNR: 1.00 : WIP\_cmp

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |                   |
|--------------------|-------------------|
| Slab group         | 1                 |
| Slabs              | 1                 |
| Dist. factor       | 50 %              |
| Position           | Isocenter         |
| Orientation        | Sagittal          |
| Phase enc. dir.    | A >> P            |
| AutoAlign          | ---               |
| Phase oversampling | 0 %               |
| Slice oversampling | 0.0 %             |
| Slices per slab    | 40                |
| FoV read           | 256 mm            |
| FoV phase          | 93.8 %            |
| Slice thickness    | 5.00 mm           |
| TR                 | 2600.0 ms         |
| TE                 | 2.82 ms           |
| Averages           | 1                 |
| Concatenations     | 1                 |
| Filter             | Prescan Normalize |
| Coil elements      | HE1-4             |

### Contrast - Common

|                   |             |
|-------------------|-------------|
| TR                | 2600.0 ms   |
| TE                | 2.82 ms     |
| Magn. preparation | Non-sel. IR |
| TI 1              | 600 ms      |
| TI 2              | 2000 ms     |
| Flip angle 1      | 5 deg       |
| Flip angle 2      | 5 deg       |
| Fat suppr.        | None        |
| Water suppr.      | None        |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Averages        | 1                |
| Averaging mode  | Long term        |
| Reconstruction  | Magn./Phase      |
| Measurements    | 1                |
| Multiple series | Each measurement |

### Resolution - Common

|                  |         |
|------------------|---------|
| FoV read         | 256 mm  |
| FoV phase        | 93.8 %  |
| Slice thickness  | 5.00 mm |
| Base resolution  | 224     |
| Phase resolution | 100 %   |
| Slice resolution | 100 %   |

### Resolution - Common

|                       |     |
|-----------------------|-----|
| Phase partial Fourier | Off |
| Slice partial Fourier | Off |
| Interpolation         | Off |

### Resolution - iPAT

|          |      |
|----------|------|
| PAT mode | None |
|----------|------|

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Image Filter      | Off |
| Distortion Corr.  | Off |
| Prescan Normalize | On  |
| Unfiltered images | Off |
| Normalize         | Off |
| B1 filter         | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |

### Geometry - Common

|                    |             |
|--------------------|-------------|
| Slab group         | 1           |
| Slabs              | 1           |
| Dist. factor       | 50 %        |
| Position           | Isocenter   |
| Orientation        | Sagittal    |
| Phase enc. dir.    | A >> P      |
| Slice oversampling | 0.0 %       |
| Slices per slab    | 40          |
| FoV read           | 256 mm      |
| FoV phase          | 93.8 %      |
| Slice thickness    | 5.00 mm     |
| TR                 | 2600.0 ms   |
| Multi-slice mode   | Single shot |
| Series             | Interleaved |
| Concatenations     | 1           |

### Geometry - AutoAlign

|                     |           |
|---------------------|-----------|
| Slab group          | 1         |
| Position            | Isocenter |
| Orientation         | Sagittal  |
| Phase enc. dir.     | A >> P    |
| AutoAlign           | ---       |
| Initial Position    | Isocenter |
| L                   | 0.0 mm    |
| P                   | 0.0 mm    |
| H                   | 0.0 mm    |
| Initial Rotation    | 0.00 deg  |
| Initial Orientation | Sagittal  |

### Geometry - Navigator

### System - Miscellaneous

|                  |           |
|------------------|-----------|
| Positioning mode | REF       |
| Table position   | H         |
| Table position   | 0 mm      |
| MSMA             | S - C - T |
| Sagittal         | R >> L    |
| Coronal          | A >> P    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Transversal         | F >> H           |
| Coil Combine Mode   | Adaptive Combine |
| Save uncombined     | Off              |
| Matrix Optimization | Performance      |
| AutoAlign           | ---              |
| Coil Select Mode    | Default          |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |           |
|-------------|-----------|
| Position    | Isocenter |
| Orientation | Sagittal  |
| Rotation    | 0.00 deg  |
| A >> P      | 240 mm    |
| F >> H      | 256 mm    |
| R >> L      | 200 mm    |
| Reset       | Off       |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | Low            |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 2600.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                   |             |
|-------------------|-------------|
| Magn. preparation | Non-sel. IR |
| TI 1              | 600 ms      |
| TI 2              | 2000 ms     |
| Fat suppr.        | None        |
| Dark blood        | Off         |
| FoV read          | 256 mm      |
| FoV phase         | 93.8 %      |
| Phase resolution  | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Inline - Common**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save original images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP-Sag              | Off |
| MIP-Cor              | Off |
| MIP-Tra              | Off |
| MIP-Time             | Off |
| Save original images | On  |

**Inline - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Inline - MapIt**

|                      |           |
|----------------------|-----------|
| Save original images | On        |
| MapIt                | T1 map    |
| Flip angle 1         | 5 deg     |
| Flip angle 2         | 5 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TR                   | 2600.0 ms |
| TE                   | 2.82 ms   |

**Sequence - Part 1**

|                     |             |
|---------------------|-------------|
| Introduction        | Off         |
| Dimension           | 3D          |
| Elliptical scanning | Off         |
| Reordering          | Linear      |
| Asymmetric echo     | Off         |
| Contrasts           | 1           |
| Flow comp.          | No          |
| Multi-slice mode    | Single shot |
| Echo spacing        | 6.6 ms      |
| Bandwidth           | 240 Hz/Px   |

**Sequence - Part 2**

|                         |          |
|-------------------------|----------|
| RF pulse type           | Fast     |
| Gradient mode           | Fast     |
| Excitation              | Non-sel. |
| RF spoiling             | On       |
| Incr. Gradient spoiling | Off      |
| Turbo factor            | 40       |

**Sequence - Special**

|                     |          |
|---------------------|----------|
| Sparse Sampling     | On       |
| US                  | 4.6 x    |
| Samples/TR          | 175      |
| Density             | 0.50     |
| Jitter Radius       | 1.2      |
| Reference Scan      | External |
| No. Ref-Lines       | 32       |
| Centric             | Off      |
| Virtual Coils       | Off      |
| No. Iterations      | 20       |
| CSM RO Resolution   | 0        |
| Regularisation INV1 | 0.00100  |
| Regularisation INV2 | 0.00040  |
| Uniform             | On       |
| Denoised UNI        | On       |
| FLAWS               | Off      |
| FLAWS-hc            | Off      |
| FLAWS-hc inv.       | Off      |
| Division image      | Off      |
| Synthetic T1 0      | 410 ms   |
| Synthetic T1 1      | 1100 ms  |
| Denoise Lambda      | 1        |
| Scaling             | 0 10^    |
| Echo Averaging      | Off      |

**Sequence - Special**

|                |     |
|----------------|-----|
| FID Monitoring | Off |
|----------------|-----|

**Sequence - Assistant**

|      |     |
|------|-----|
| Mode | Off |
|------|-----|

\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\t2s\_megre \*

TA: 0:24 PM: FIX Voxel size: 3.6×3.6×5.0 mmPAT: 3 Rel. SNR: 1.00 : fl\_r

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |                                      |
|--------------------|--------------------------------------|
| Slab group         | 1                                    |
| Slabs              | 1                                    |
| Dist. factor       | 20 %                                 |
| Position           | Isocenter                            |
| Orientation        | Coronal                              |
| Phase enc. dir.    | F >> H                               |
| AutoAlign          | ---                                  |
| Phase oversampling | 10 %                                 |
| Slice oversampling | 0.0 %                                |
| Slices per slab    | 30                                   |
| FoV read           | 230 mm                               |
| FoV phase          | 90.6 %                               |
| Slice thickness    | 5.00 mm                              |
| TR                 | 25.0 ms                              |
| TE 1               | 10.00 ms                             |
| TE 2               | 15.00 ms                             |
| TE 3               | 20.00 ms                             |
| Averages           | 1                                    |
| Concatenations     | 1                                    |
| Filter             | Prescan Normalize, Elliptical filter |
| Coil elements      | HE1-4                                |

### Contrast - Common

|                   |          |
|-------------------|----------|
| TR                | 25.0 ms  |
| TE 1              | 10.00 ms |
| TE 2              | 15.00 ms |
| TE 3              | 20.00 ms |
| MTC               | Off      |
| Magn. preparation | None     |
| Flip angle        | 15 deg   |
| Fat suppr.        | None     |
| Water suppr.      | None     |
| SWI               | Off      |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Averages        | 1                |
| Averaging mode  | Long term        |
| Reconstruction  | Magn./Phase      |
| Measurements    | 1                |
| Multiple series | Each measurement |

### Resolution - Common

|           |        |
|-----------|--------|
| FoV read  | 230 mm |
| FoV phase | 90.6 % |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| Slice thickness       | 5.00 mm |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Slice resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Slice partial Fourier | Off     |
| Interpolation         | Off     |

### Resolution - iPAT

|                     |            |
|---------------------|------------|
| PAT mode            | GRAPPA     |
| Accel. factor PE    | 3          |
| Ref. lines PE       | 24         |
| Accel. factor 3D    | 1          |
| Reference scan mode | Integrated |

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Image Filter      | Off |
| Distortion Corr.  | Off |
| Prescan Normalize | On  |
| Unfiltered images | On  |
| Normalize         | Off |
| B1 filter         | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | On  |

### Geometry - Common

|                    |             |
|--------------------|-------------|
| Slab group         | 1           |
| Slabs              | 1           |
| Dist. factor       | 20 %        |
| Position           | Isocenter   |
| Orientation        | Coronal     |
| Phase enc. dir.    | F >> H      |
| Slice oversampling | 0.0 %       |
| Slices per slab    | 30          |
| FoV read           | 230 mm      |
| FoV phase          | 90.6 %      |
| Slice thickness    | 5.00 mm     |
| TR                 | 25.0 ms     |
| Multi-slice mode   | Interleaved |
| Series             | Interleaved |
| Concatenations     | 1           |

### Geometry - AutoAlign

|                     |           |
|---------------------|-----------|
| Slab group          | 1         |
| Position            | Isocenter |
| Orientation         | Coronal   |
| Phase enc. dir.     | F >> H    |
| AutoAlign           | ---       |
| Initial Position    | Isocenter |
| L                   | 0.0 mm    |
| P                   | 0.0 mm    |
| H                   | 0.0 mm    |
| Initial Rotation    | 90.00 deg |
| Initial Orientation | Coronal   |

### Geometry - Saturation

|                 |          |
|-----------------|----------|
| Saturation mode | Standard |
|-----------------|----------|

**Geometry - Saturation**

|              |      |
|--------------|------|
| Fat suppr.   | None |
| Water suppr. | None |
| Special sat. | None |

**System - Miscellaneous**

|                     |                      |
|---------------------|----------------------|
| Positioning mode    | FIX                  |
| Table position      | H                    |
| Table position      | 0 mm                 |
| MSMA                | S - C - T            |
| Sagittal            | R >> L               |
| Coronal             | A >> P               |
| Transversal         | F >> H               |
| Coil Combine Mode   | Adaptive Combine     |
| Save uncombined     | Off                  |
| Matrix Optimization | Off                  |
| AutoAlign           | ---                  |
| Coil Select Mode    | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |           |
|-------------|-----------|
| Position    | Isocenter |
| Orientation | Coronal   |
| Rotation    | 90.00 deg |
| F >> H      | 209 mm    |
| R >> L      | 230 mm    |
| A >> P      | 150 mm    |
| Reset       | Off       |

**System - pTx Volumes**

|              |           |
|--------------|-----------|
| B1 Shim mode | TrueForm  |
| Excitation   | Slab-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | Low            |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 25.0 ms |
| Concatenations  | 1       |
| Segments        | 1       |

**Physio - Cardiac**

|                   |        |
|-------------------|--------|
| Magn. preparation | None   |
| Fat suppr.        | None   |
| Dark blood        | Off    |
| FoV read          | 230 mm |
| FoV phase         | 90.6 % |
| Phase resolution  | 100 %  |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Inline - Common**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Liver registration   | Off |
| Save original images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP-Sag              | Off |
| MIP-Cor              | Off |
| MIP-Tra              | Off |
| MIP-Time             | Off |
| Save original images | On  |

**Inline - Soft Tissue**

|              |     |
|--------------|-----|
| Wash - In    | Off |
| Wash - Out   | Off |
| TTP          | Off |
| PEI          | Off |
| MIP - time   | Off |
| Measurements | 1   |

**Inline - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Inline - MapIt**

|                      |          |
|----------------------|----------|
| Noise threshold      | 15       |
| Save original images | On       |
| MapIt                | R2* map  |
| Flip angle           | 15 deg   |
| Measurements         | 1        |
| Contrasts            | 3        |
| TR                   | 25.0 ms  |
| TE 1                 | 10.00 ms |
| TE 2                 | 15.00 ms |
| TE 3                 | 20.00 ms |

**Sequence - Part 1**

|                     |             |
|---------------------|-------------|
| Introduction        | Off         |
| Dimension           | 3D          |
| Elliptical scanning | On          |
| Phase stabilisation | Off         |
| Asymmetric echo     | Off         |
| Contrasts           | 3           |
| Flow comp. 1        | Yes         |
| Readout mode        | Monopolar   |
| Multi-slice mode    | Interleaved |
| Bandwidth 1         | 310 Hz/Px   |
| Bandwidth 2         | 310 Hz/Px   |
| Bandwidth 3         | 310 Hz/Px   |

**Sequence - Part 2**

|                          |           |
|--------------------------|-----------|
| Segments                 | 1         |
| Acoustic noise reduction | None      |
| RF pulse type            | Fast      |
| Gradient mode            | Normal    |
| Excitation               | Slab-sel. |
| RF spoiling              | On        |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| Mode          | Off |
| Allowed delay | 0 s |



**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\ep2d\_se\_ap \***

TA: 0:12 PM: REF Voxel size: 1.5×1.5×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Resolution - iPAT

|                     |              |
|---------------------|--------------|
| Accel. factor PE    | 2            |
| Ref. lines PE       | 24           |
| Reference scan mode | EPI/separate |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | On  |
| Elliptical filter | Off |

### Routine

|                    |                                  |
|--------------------|----------------------------------|
| Slice group        | 1                                |
| Slices             | 25                               |
| Dist. factor       | 25 %                             |
| Position           | Isocenter                        |
| Orientation        | Transversal                      |
| Phase enc. dir.    | A >> P                           |
| AutoAlign          | ---                              |
| Phase oversampling | 0 %                              |
| FoV read           | 192 mm                           |
| FoV phase          | 100.0 %                          |
| Slice thickness    | 4.0 mm                           |
| TR                 | 3000 ms                          |
| TE                 | 60.0 ms                          |
| Averages           | 1                                |
| Concatenations     | 1                                |
| Filter             | Raw filter, Prescan<br>Normalize |
| Coil elements      | HE1-4                            |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 25          |
| Dist. factor     | 25 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | A >> P      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 4.0 mm      |
| TR               | 3000 ms     |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | -0.01 deg   |
| Initial Orientation | Transversal |

### Contrast - Common

|                   |          |
|-------------------|----------|
| TR                | 3000 ms  |
| TE                | 60.0 ms  |
| MTC               | Off      |
| Magn. preparation | None     |
| Fat suppr.        | Fat sat. |
| Fat sat. mode     | Strong   |

### Contrast - Dynamic

|                |           |
|----------------|-----------|
| Averages       | 1         |
| Averaging mode | Long term |
| Reconstruction | Magnitude |
| Measurements   | 1         |
| Delay in TR    | 0 ms      |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | On      |

### Resolution - iPAT

|             |        |
|-------------|--------|
| Accel. mode | GRAPPA |
|-------------|--------|

### Geometry - Saturation

|               |          |
|---------------|----------|
| Fat suppr.    | Fat sat. |
| Fat sat. mode | Strong   |
| Special sat.  | None     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                  |
|---------------------|------------------|
| Positioning mode    | REF              |
| Table position      | H                |
| Table position      | 0 mm             |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combine Mode   | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Miscellaneous**

|                  |                      |
|------------------|----------------------|
| AutoAlign        | ---                  |
| Coil Select Mode | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | -0.01 deg   |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 3000 ms |
| Concatenations  | 1       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Diff - Neuro**

|                       |                     |
|-----------------------|---------------------|
| Diffusion mode        | Slice               |
| Diff. directions      | 1                   |
| Diffusion Scheme      | Monopolar           |
| Diff. weightings      | 1                   |
| b-value               | 0 s/mm <sup>2</sup> |
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| FA maps               | Off                 |
| Mosaic                | Off                 |
| Tensor                | Off                 |
| Noise level           | 40                  |

**Diff - Body**

|                  |                     |
|------------------|---------------------|
| Diffusion mode   | Slice               |
| Diff. directions | 1                   |
| Diffusion Scheme | Monopolar           |
| Diff. weightings | 1                   |
| b-value          | 0 s/mm <sup>2</sup> |

**Diff - Body**

|                       |                     |
|-----------------------|---------------------|
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| Exponential ADC Maps  | Off                 |
| FA maps               | Off                 |
| Invert Gray Scale     | Off                 |
| Calculated Image      | Off                 |
| b-Value >=            | 0 s/mm <sup>2</sup> |
| Noise level           | 40                  |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Optimization      | None        |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |

**Sequence - pTX Pulses**

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\ep2d\_se\_pa \***

TA: 0:12 PM: REF Voxel size: 1.5×1.5×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |                                  |
|--------------------|----------------------------------|
| Slice group        | 1                                |
| Slices             | 25                               |
| Dist. factor       | 25 %                             |
| Position           | Isocenter                        |
| Orientation        | Transversal                      |
| Phase enc. dir.    | P >> A                           |
| AutoAlign          | ---                              |
| Phase oversampling | 0 %                              |
| FoV read           | 192 mm                           |
| FoV phase          | 100.0 %                          |
| Slice thickness    | 4.0 mm                           |
| TR                 | 3000 ms                          |
| TE                 | 60.0 ms                          |
| Averages           | 1                                |
| Concatenations     | 1                                |
| Filter             | Raw filter, Prescan<br>Normalize |
| Coil elements      | HE1-4                            |

### Contrast - Common

|                   |          |
|-------------------|----------|
| TR                | 3000 ms  |
| TE                | 60.0 ms  |
| MTC               | Off      |
| Magn. preparation | None     |
| Fat suppr.        | Fat sat. |
| Fat sat. mode     | Strong   |

### Contrast - Dynamic

|                |           |
|----------------|-----------|
| Averages       | 1         |
| Averaging mode | Long term |
| Reconstruction | Magnitude |
| Measurements   | 1         |
| Delay in TR    | 0 ms      |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | On      |

### Resolution - iPAT

|             |        |
|-------------|--------|
| Accel. mode | GRAPPA |
|-------------|--------|

### Resolution - iPAT

|                     |              |
|---------------------|--------------|
| Accel. factor PE    | 2            |
| Ref. lines PE       | 24           |
| Reference scan mode | EPI/separate |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | On  |
| Elliptical filter | Off |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 25          |
| Dist. factor     | 25 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | P >> A      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 4.0 mm      |
| TR               | 3000 ms     |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | P >> A      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 180.00 deg  |
| Initial Orientation | Transversal |

### Geometry - Saturation

|               |          |
|---------------|----------|
| Fat suppr.    | Fat sat. |
| Fat sat. mode | Strong   |
| Special sat.  | None     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                  |
|---------------------|------------------|
| Positioning mode    | REF              |
| Table position      | H                |
| Table position      | 0 mm             |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combine Mode   | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Miscellaneous**

|                  |                      |
|------------------|----------------------|
| AutoAlign        | ---                  |
| Coil Select Mode | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 180.00 deg  |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 3000 ms |
| Concatenations  | 1       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Diff - Neuro**

|                       |                     |
|-----------------------|---------------------|
| Diffusion mode        | Slice               |
| Diff. directions      | 1                   |
| Diffusion Scheme      | Monopolar           |
| Diff. weightings      | 1                   |
| b-value               | 0 s/mm <sup>2</sup> |
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| FA maps               | Off                 |
| Mosaic                | Off                 |
| Tensor                | Off                 |
| Noise level           | 40                  |

**Diff - Body**

|                  |                     |
|------------------|---------------------|
| Diffusion mode   | Slice               |
| Diff. directions | 1                   |
| Diffusion Scheme | Monopolar           |
| Diff. weightings | 1                   |
| b-value          | 0 s/mm <sup>2</sup> |

**Diff - Body**

|                       |                     |
|-----------------------|---------------------|
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| Exponential ADC Maps  | Off                 |
| FA maps               | Off                 |
| Invert Gray Scale     | Off                 |
| Calculated Image      | Off                 |
| b-Value >=            | 0 s/mm <sup>2</sup> |
| Noise level           | 40                  |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Optimization      | None        |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |

**Sequence - pTX Pulses**

\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\ep2d\_fid\_basic\_bold\_p2\_task \*

TA: 0:20 PM: REF Voxel size: 3.0×3.0×4.0 mmPAT: 2 Rel. SNR: 1.00 : epfid

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Resolution - iPAT

|                     |              |
|---------------------|--------------|
| Ref. lines PE       | 24           |
| Reference scan mode | EPI/separate |

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Distortion Corr.  | Off |
| Prescan Normalize | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |
| Hamming           | Off |

### Routine

|                    |             |
|--------------------|-------------|
| Slice group        | 1           |
| Slices             | 25          |
| Dist. factor       | 25 %        |
| Position           | Isocenter   |
| Orientation        | Transversal |
| Phase enc. dir.    | A >> P      |
| AutoAlign          | ---         |
| Phase oversampling | 0 %         |
| FoV read           | 192 mm      |
| FoV phase          | 100.0 %     |
| Slice thickness    | 4.0 mm      |
| TR                 | 2800 ms     |
| TE                 | 30.0 ms     |
| Averages           | 1           |
| Concatenations     | 1           |
| Filter             | None        |
| Coil elements      | HE1-4       |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 25          |
| Dist. factor     | 25 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | A >> P      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 4.0 mm      |
| TR               | 2800 ms     |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 0.00 deg    |
| Initial Orientation | Transversal |

### Contrast - Common

|            |          |
|------------|----------|
| TR         | 2800 ms  |
| TE         | 30.0 ms  |
| MTC        | Off      |
| Flip angle | 90 deg   |
| Fat suppr. | Fat sat. |

### Contrast - Dynamic

|                 |           |
|-----------------|-----------|
| Averages        | 1         |
| Averaging mode  | Long term |
| Reconstruction  | Magnitude |
| Measurements    | 4         |
| Delay in TR     | 1000 ms   |
| Multiple series | Off       |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | Off     |

### Resolution - iPAT

|                  |        |
|------------------|--------|
| Accel. mode      | GRAPPA |
| Accel. factor PE | 2      |

### Geometry - Saturation

|              |          |
|--------------|----------|
| Fat suppr.   | Fat sat. |
| Special sat. | None     |

### System - Miscellaneous

|                     |                      |
|---------------------|----------------------|
| Positioning mode    | REF                  |
| Table position      | H                    |
| Table position      | 0 mm                 |
| MSMA                | S - C - T            |
| Sagittal            | R >> L               |
| Coronal             | A >> P               |
| Transversal         | F >> H               |
| Coil Combine Mode   | Sum of Squares       |
| Matrix Optimization | Off                  |
| AutoAlign           | ---                  |
| Coil Select Mode    | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 2800 ms |
| Concatenations  | 1       |

**Perf**

|              |     |
|--------------|-----|
| GBP          | Off |
| PBP          | Off |
| TTP          | Off |
| relCBV       | Off |
| relCBF       | Off |
| relMTT       | Off |
| relCBVCorr   | Off |
| Measurements | 4   |

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |

**Sequence - pTX Pulses**

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\ep2d\_se\_ap \***

TA: 0:12 PM: REF Voxel size: 1.5×1.5×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Resolution - iPAT

|                     |              |
|---------------------|--------------|
| Accel. factor PE    | 2            |
| Ref. lines PE       | 24           |
| Reference scan mode | EPI/separate |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | On  |
| Elliptical filter | Off |

### Routine

|                    |                                  |
|--------------------|----------------------------------|
| Slice group        | 1                                |
| Slices             | 25                               |
| Dist. factor       | 25 %                             |
| Position           | Isocenter                        |
| Orientation        | Transversal                      |
| Phase enc. dir.    | A >> P                           |
| AutoAlign          | ---                              |
| Phase oversampling | 0 %                              |
| FoV read           | 192 mm                           |
| FoV phase          | 100.0 %                          |
| Slice thickness    | 4.0 mm                           |
| TR                 | 3000 ms                          |
| TE                 | 60.0 ms                          |
| Averages           | 1                                |
| Concatenations     | 1                                |
| Filter             | Raw filter, Prescan<br>Normalize |
| Coil elements      | HE1-4                            |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 25          |
| Dist. factor     | 25 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | A >> P      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 4.0 mm      |
| TR               | 3000 ms     |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | -0.01 deg   |
| Initial Orientation | Transversal |

### Contrast - Common

|                   |          |
|-------------------|----------|
| TR                | 3000 ms  |
| TE                | 60.0 ms  |
| MTC               | Off      |
| Magn. preparation | None     |
| Fat suppr.        | Fat sat. |
| Fat sat. mode     | Strong   |

### Contrast - Dynamic

|                |           |
|----------------|-----------|
| Averages       | 1         |
| Averaging mode | Long term |
| Reconstruction | Magnitude |
| Measurements   | 1         |
| Delay in TR    | 0 ms      |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | On      |

### Resolution - iPAT

|             |        |
|-------------|--------|
| Accel. mode | GRAPPA |
|-------------|--------|

### Geometry - Saturation

|               |          |
|---------------|----------|
| Fat suppr.    | Fat sat. |
| Fat sat. mode | Strong   |
| Special sat.  | None     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                  |
|---------------------|------------------|
| Positioning mode    | REF              |
| Table position      | H                |
| Table position      | 0 mm             |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combine Mode   | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Miscellaneous**

|                  |                      |
|------------------|----------------------|
| AutoAlign        | ---                  |
| Coil Select Mode | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | -0.01 deg   |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 3000 ms |
| Concatenations  | 1       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Diff - Neuro**

|                       |                     |
|-----------------------|---------------------|
| Diffusion mode        | Slice               |
| Diff. directions      | 1                   |
| Diffusion Scheme      | Monopolar           |
| Diff. weightings      | 1                   |
| b-value               | 0 s/mm <sup>2</sup> |
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| FA maps               | Off                 |
| Mosaic                | Off                 |
| Tensor                | Off                 |
| Noise level           | 40                  |

**Diff - Body**

|                  |                     |
|------------------|---------------------|
| Diffusion mode   | Slice               |
| Diff. directions | 1                   |
| Diffusion Scheme | Monopolar           |
| Diff. weightings | 1                   |
| b-value          | 0 s/mm <sup>2</sup> |

**Diff - Body**

|                       |                     |
|-----------------------|---------------------|
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| Exponential ADC Maps  | Off                 |
| FA maps               | Off                 |
| Invert Gray Scale     | Off                 |
| Calculated Image      | Off                 |
| b-Value >=            | 0 s/mm <sup>2</sup> |
| Noise level           | 40                  |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Optimization      | None        |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |

**Sequence - pTX Pulses**



\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\ep2d\_se\_pa \*

TA: 0:12 PM: REF Voxel size: 1.5×1.5×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Resolution - iPAT

|                     |              |
|---------------------|--------------|
| Accel. factor PE    | 2            |
| Ref. lines PE       | 24           |
| Reference scan mode | EPI/separate |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | On  |
| Elliptical filter | Off |

### Routine

|                    |                                  |
|--------------------|----------------------------------|
| Slice group        | 1                                |
| Slices             | 25                               |
| Dist. factor       | 25 %                             |
| Position           | Isocenter                        |
| Orientation        | Transversal                      |
| Phase enc. dir.    | P >> A                           |
| AutoAlign          | ---                              |
| Phase oversampling | 0 %                              |
| FoV read           | 192 mm                           |
| FoV phase          | 100.0 %                          |
| Slice thickness    | 4.0 mm                           |
| TR                 | 3000 ms                          |
| TE                 | 60.0 ms                          |
| Averages           | 1                                |
| Concatenations     | 1                                |
| Filter             | Raw filter, Prescan<br>Normalize |
| Coil elements      | HE1-4                            |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 25          |
| Dist. factor     | 25 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | P >> A      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 4.0 mm      |
| TR               | 3000 ms     |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | P >> A      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 180.00 deg  |
| Initial Orientation | Transversal |

### Contrast - Common

|                   |          |
|-------------------|----------|
| TR                | 3000 ms  |
| TE                | 60.0 ms  |
| MTC               | Off      |
| Magn. preparation | None     |
| Fat suppr.        | Fat sat. |
| Fat sat. mode     | Strong   |

### Contrast - Dynamic

|                |           |
|----------------|-----------|
| Averages       | 1         |
| Averaging mode | Long term |
| Reconstruction | Magnitude |
| Measurements   | 1         |
| Delay in TR    | 0 ms      |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | On      |

### Resolution - iPAT

|             |        |
|-------------|--------|
| Accel. mode | GRAPPA |
|-------------|--------|

### Geometry - Saturation

|               |          |
|---------------|----------|
| Fat suppr.    | Fat sat. |
| Fat sat. mode | Strong   |
| Special sat.  | None     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                  |
|---------------------|------------------|
| Positioning mode    | REF              |
| Table position      | H                |
| Table position      | 0 mm             |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combine Mode   | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Miscellaneous**

|                  |                      |
|------------------|----------------------|
| AutoAlign        | ---                  |
| Coil Select Mode | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 180.00 deg  |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 3000 ms |
| Concatenations  | 1       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. control  | Off |
| Concatenations | 1   |

**Diff - Neuro**

|                       |                     |
|-----------------------|---------------------|
| Diffusion mode        | Slice               |
| Diff. directions      | 1                   |
| Diffusion Scheme      | Monopolar           |
| Diff. weightings      | 1                   |
| b-value               | 0 s/mm <sup>2</sup> |
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| FA maps               | Off                 |
| Mosaic                | Off                 |
| Tensor                | Off                 |
| Noise level           | 40                  |

**Diff - Body**

|                  |                     |
|------------------|---------------------|
| Diffusion mode   | Slice               |
| Diff. directions | 1                   |
| Diffusion Scheme | Monopolar           |
| Diff. weightings | 1                   |
| b-value          | 0 s/mm <sup>2</sup> |

**Diff - Body**

|                       |                     |
|-----------------------|---------------------|
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| Exponential ADC Maps  | Off                 |
| FA maps               | Off                 |
| Invert Gray Scale     | Off                 |
| Calculated Image      | Off                 |
| b-Value >=            | 0 s/mm <sup>2</sup> |
| Noise level           | 40                  |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Optimization      | None        |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |

**Sequence - pTX Pulses**

\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\ep2d\_fid\_basic\_bold\_p2\_rest \*

TA: 0:31 PM: REF Voxel size: 3.0×3.0×4.0 mmPAT: 2 Rel. SNR: 1.00 : epfid

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |             |
|--------------------|-------------|
| Slice group        | 1           |
| Slices             | 25          |
| Dist. factor       | 35 %        |
| Position           | Isocenter   |
| Orientation        | Transversal |
| Phase enc. dir.    | A >> P      |
| AutoAlign          | ---         |
| Phase oversampling | 0 %         |
| FoV read           | 192 mm      |
| FoV phase          | 100.0 %     |
| Slice thickness    | 4.0 mm      |
| TR                 | 2800 ms     |
| TE                 | 30.0 ms     |
| Averages           | 1           |
| Concatenations     | 1           |
| Filter             | None        |
| Coil elements      | HE1-4       |

### Contrast - Common

|            |          |
|------------|----------|
| TR         | 2800 ms  |
| TE         | 30.0 ms  |
| MTC        | Off      |
| Flip angle | 90 deg   |
| Fat suppr. | Fat sat. |

### Contrast - Dynamic

|                 |           |
|-----------------|-----------|
| Averages        | 1         |
| Averaging mode  | Long term |
| Reconstruction  | Magnitude |
| Measurements    | 8         |
| Delay in TR     | 1000 ms   |
| Multiple series | Off       |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.0 mm  |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | Off     |

### Resolution - iPAT

|                  |        |
|------------------|--------|
| Accel. mode      | GRAPPA |
| Accel. factor PE | 2      |

### Resolution - iPAT

|                     |              |
|---------------------|--------------|
| Ref. lines PE       | 24           |
| Reference scan mode | EPI/separate |

### Resolution - Filter Image

|                   |     |
|-------------------|-----|
| Distortion Corr.  | Off |
| Prescan Normalize | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |
| Hamming           | Off |

### Geometry - Common

|                  |             |
|------------------|-------------|
| Slice group      | 1           |
| Slices           | 25          |
| Dist. factor     | 35 %        |
| Position         | Isocenter   |
| Orientation      | Transversal |
| Phase enc. dir.  | A >> P      |
| FoV read         | 192 mm      |
| FoV phase        | 100.0 %     |
| Slice thickness  | 4.0 mm      |
| TR               | 2800 ms     |
| Multi-slice mode | Interleaved |
| Series           | Interleaved |
| Concatenations   | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 0.00 deg    |
| Initial Orientation | Transversal |

### Geometry - Saturation

|              |          |
|--------------|----------|
| Fat suppr.   | Fat sat. |
| Special sat. | None     |

### System - Miscellaneous

|                     |                      |
|---------------------|----------------------|
| Positioning mode    | REF                  |
| Table position      | H                    |
| Table position      | 0 mm                 |
| MSMA                | S - C - T            |
| Sagittal            | R >> L               |
| Coronal             | A >> P               |
| Transversal         | F >> H               |
| Coil Combine Mode   | Sum of Squares       |
| Matrix Optimization | Off                  |
| AutoAlign           | ---                  |
| Coil Select Mode    | Off - AutoCoilSelect |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 134 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 2800 ms |
| Concatenations  | 1       |

**Perf**

|              |     |
|--------------|-----|
| GBP          | Off |
| PBP          | Off |
| TTP          | Off |
| relCBV       | Off |
| relCBF       | Off |
| relMTT       | Off |
| relCBVCorr   | Off |
| Measurements | 8   |

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |

**Sequence - pTX Pulses**

\\USER\2019\_MBC\_PROTOCOLS\_VE11\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\cmrr\_ep2d\_se\_ap \*

TA: 0:12 PM: REF Voxel size: 3.0×3.0×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                          |                   |
|--------------------------|-------------------|
| Slice group              | 1                 |
| Slices                   | 25                |
| Dist. factor             | 25 %              |
| Position                 | Isocenter         |
| Orientation              | Transversal       |
| Phase enc. dir.          | A >> P            |
| AutoAlign                | ---               |
| Phase oversampling       | 0 %               |
| FoV read                 | 192 mm            |
| FoV phase                | 100.0 %           |
| Slice thickness          | 4.00 mm           |
| TR                       | 3000 ms           |
| TE                       | 60.00 ms          |
| Multi-band accel. factor | 1                 |
| Filter                   | Prescan Normalize |
| Coil elements            | HE1-4             |

### Contrast - Common

|                       |          |
|-----------------------|----------|
| TR                    | 3000 ms  |
| TE                    | 60.00 ms |
| MTC                   | Off      |
| Magn. preparation     | None     |
| Flip angle            | 90 deg   |
| Refocus flip angle    | 180 deg  |
| Fat suppr.            | Fat sat. |
| Grad. rev. fat suppr. | Enabled  |

### Contrast - Dynamic

|                 |           |
|-----------------|-----------|
| Averaging mode  | Long term |
| Reconstruction  | Magnitude |
| Measurements    | 1         |
| Delay in TR     | 0 ms      |
| Multiple series | Off       |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.00 mm |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | Off     |

### Resolution - iPAT

|          |        |
|----------|--------|
| PAT mode | GRAPPA |
|----------|--------|

### Resolution - iPAT

|                     |             |
|---------------------|-------------|
| Accel. factor PE    | 2           |
| Ref. lines PE       | 24          |
| Reference scan mode | Single-shot |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |

### Geometry - Common

|                          |             |
|--------------------------|-------------|
| Slice group              | 1           |
| Slices                   | 25          |
| Dist. factor             | 25 %        |
| Position                 | Isocenter   |
| Orientation              | Transversal |
| Phase enc. dir.          | A >> P      |
| FoV read                 | 192 mm      |
| FoV phase                | 100.0 %     |
| Slice thickness          | 4.00 mm     |
| TR                       | 3000 ms     |
| Multi-slice mode         | Interleaved |
| Series                   | Interleaved |
| Multi-band accel. factor | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 0.00 deg    |
| Initial Orientation | Transversal |

### Geometry - Saturation

|                       |          |
|-----------------------|----------|
| Fat suppr.            | Fat sat. |
| Grad. rev. fat suppr. | Enabled  |
| Special sat.          | None     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                |
|---------------------|----------------|
| Positioning mode    | REF            |
| Table position      | H              |
| Table position      | 0 mm           |
| MSMA                | S - C - T      |
| Sagittal            | R >> L         |
| Coronal             | A >> P         |
| Transversal         | F >> H         |
| Coil Combine Mode   | Sum of Squares |
| Matrix Optimization | Off            |

**System - Miscellaneous**

|                  |         |
|------------------|---------|
| AutoAlign        | ---     |
| Coil Select Mode | Default |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                          |         |
|--------------------------|---------|
| 1st Signal/Mode          | None    |
| TR                       | 3000 ms |
| Multi-band accel. factor | 1       |

**Physio - PACE**

|                          |     |
|--------------------------|-----|
| Resp. control            | Off |
| Multi-band accel. factor | 1   |

**Diff - Neuro**

|                       |                     |
|-----------------------|---------------------|
| Diffusion mode        | MDDW                |
| Diff. directions      | 6                   |
| Diffusion Scheme      | Monopolar           |
| Diff. weightings      | 1                   |
| b-value               | 0 s/mm <sup>2</sup> |
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| FA maps               | Off                 |
| Mosaic                | Off                 |
| Tensor                | Off                 |
| Noise level           | 40                  |

**Diff - Body**

|                  |                     |
|------------------|---------------------|
| Diffusion mode   | MDDW                |
| Diff. directions | 6                   |
| Diffusion Scheme | Monopolar           |
| Diff. weightings | 1                   |
| b-value          | 0 s/mm <sup>2</sup> |

**Diff - Body**

|                       |                     |
|-----------------------|---------------------|
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| Exponential ADC Maps  | Off                 |
| FA maps               | Off                 |
| Invert Gray Scale     | Off                 |
| Calculated Image      | Off                 |
| b-Value >=            | 0 s/mm <sup>2</sup> |
| Noise level           | 40                  |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |
| RF spoiling   | Off         |

**Sequence - Special**

|                          |      |
|--------------------------|------|
| SENSE1 coil combine      | On   |
| Invert RO/PE polarity    | Off  |
| Disable freq. update     | Off  |
| Force equal slice timing | Off  |
| FFT scale factor         | 1.00 |
| Physio recording         | Off  |

\\USER\2019\_MBC\_PROTOCOLS\_VE11\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\cmrr\_ep2d\_se\_apinvrope \*

TA: 0:12 PM: REF Voxel size: 3.0×3.0×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Resolution - iPAT

|                     |             |
|---------------------|-------------|
| Accel. factor PE    | 2           |
| Ref. lines PE       | 24          |
| Reference scan mode | Single-shot |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |

### Routine

|                          |                   |
|--------------------------|-------------------|
| Slice group              | 1                 |
| Slices                   | 25                |
| Dist. factor             | 25 %              |
| Position                 | Isocenter         |
| Orientation              | Transversal       |
| Phase enc. dir.          | A >> P            |
| AutoAlign                | ---               |
| Phase oversampling       | 0 %               |
| FoV read                 | 192 mm            |
| FoV phase                | 100.0 %           |
| Slice thickness          | 4.00 mm           |
| TR                       | 3000 ms           |
| TE                       | 60.00 ms          |
| Multi-band accel. factor | 1                 |
| Filter                   | Prescan Normalize |
| Coil elements            | HE1-4             |

### Geometry - Common

|                          |             |
|--------------------------|-------------|
| Slice group              | 1           |
| Slices                   | 25          |
| Dist. factor             | 25 %        |
| Position                 | Isocenter   |
| Orientation              | Transversal |
| Phase enc. dir.          | A >> P      |
| FoV read                 | 192 mm      |
| FoV phase                | 100.0 %     |
| Slice thickness          | 4.00 mm     |
| TR                       | 3000 ms     |
| Multi-slice mode         | Interleaved |
| Series                   | Interleaved |
| Multi-band accel. factor | 1           |

### Contrast - Common

|                       |          |
|-----------------------|----------|
| TR                    | 3000 ms  |
| TE                    | 60.00 ms |
| MTC                   | Off      |
| Magn. preparation     | None     |
| Flip angle            | 90 deg   |
| Refocus flip angle    | 180 deg  |
| Fat suppr.            | Fat sat. |
| Grad. rev. fat suppr. | Enabled  |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 0.00 deg    |
| Initial Orientation | Transversal |

### Contrast - Dynamic

|                 |           |
|-----------------|-----------|
| Averaging mode  | Long term |
| Reconstruction  | Magnitude |
| Measurements    | 1         |
| Delay in TR     | 0 ms      |
| Multiple series | Off       |

### Geometry - Saturation

|                       |          |
|-----------------------|----------|
| Fat suppr.            | Fat sat. |
| Grad. rev. fat suppr. | Enabled  |
| Special sat.          | None     |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 192 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.00 mm |
| Base resolution       | 64      |
| Phase resolution      | 100 %   |
| Phase partial Fourier | Off     |
| Interpolation         | Off     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                |
|---------------------|----------------|
| Positioning mode    | REF            |
| Table position      | H              |
| Table position      | 0 mm           |
| MSMA                | S - C - T      |
| Sagittal            | R >> L         |
| Coronal             | A >> P         |
| Transversal         | F >> H         |
| Coil Combine Mode   | Sum of Squares |
| Matrix Optimization | Off            |

### Resolution - iPAT

|          |        |
|----------|--------|
| PAT mode | GRAPPA |
|----------|--------|

**System - Miscellaneous**

|                  |         |
|------------------|---------|
| AutoAlign        | ---     |
| Coil Select Mode | Default |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 192 mm      |
| R >> L      | 192 mm      |
| F >> H      | 124 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                          |         |
|--------------------------|---------|
| 1st Signal/Mode          | None    |
| TR                       | 3000 ms |
| Multi-band accel. factor | 1       |

**Physio - PACE**

|                          |     |
|--------------------------|-----|
| Resp. control            | Off |
| Multi-band accel. factor | 1   |

**Diff - Neuro**

|                       |                     |
|-----------------------|---------------------|
| Diffusion mode        | MDDW                |
| Diff. directions      | 6                   |
| Diffusion Scheme      | Monopolar           |
| Diff. weightings      | 1                   |
| b-value               | 0 s/mm <sup>2</sup> |
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| FA maps               | Off                 |
| Mosaic                | Off                 |
| Tensor                | Off                 |
| Noise level           | 40                  |

**Diff - Body**

|                  |                     |
|------------------|---------------------|
| Diffusion mode   | MDDW                |
| Diff. directions | 6                   |
| Diffusion Scheme | Monopolar           |
| Diff. weightings | 1                   |
| b-value          | 0 s/mm <sup>2</sup> |

**Diff - Body**

|                       |                     |
|-----------------------|---------------------|
| b-value               | 1                   |
| Diff. weighted images | On                  |
| Trace weighted images | Off                 |
| ADC maps              | Off                 |
| Exponential ADC Maps  | Off                 |
| FA maps               | Off                 |
| Invert Gray Scale     | Off                 |
| Calculated Image      | Off                 |
| b-Value >=            | 0 s/mm <sup>2</sup> |
| Noise level           | 40                  |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.49 ms     |
| Bandwidth         | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 64          |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |
| RF spoiling   | Off         |

**Sequence - Special**

|                          |      |
|--------------------------|------|
| SENSE1 coil combine      | On   |
| Invert RO/PE polarity    | On   |
| Disable freq. update     | Off  |
| Force equal slice timing | Off  |
| FFT scale factor         | 1.00 |
| Physio recording         | Off  |



\\USER\2019\_MBC\_PROTOCOLS\_VE11\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\cmrr\_mbep2d\_diff \*

TA: 0:38 PM: REF Voxel size: 1.1×1.1×4.0 mmPAT: 2 Rel. SNR: 1.00 : epse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                          |                   |
|--------------------------|-------------------|
| Slice group              | 1                 |
| Slices                   | 27                |
| Dist. factor             | 30 %              |
| Position                 | Isocenter         |
| Orientation              | Transversal       |
| Phase enc. dir.          | A >> P            |
| AutoAlign                | ---               |
| Phase oversampling       | 0 %               |
| FoV read                 | 220 mm            |
| FoV phase                | 100.0 %           |
| Slice thickness          | 4.00 mm           |
| TR                       | 3800 ms           |
| TE                       | 81.00 ms          |
| Multi-band accel. factor | 1                 |
| Filter                   | Prescan Normalize |
| Coil elements            | HE1-4             |

### Contrast - Common

|                       |          |
|-----------------------|----------|
| TR                    | 3800 ms  |
| TE                    | 81.00 ms |
| MTC                   | Off      |
| Magn. preparation     | None     |
| Flip angle            | 90 deg   |
| Refocus flip angle    | 180 deg  |
| Fat suppr.            | Fat sat. |
| Grad. rev. fat suppr. | Enabled  |

### Contrast - Dynamic

|                 |             |
|-----------------|-------------|
| Averaging mode  | Long term   |
| Reconstruction  | Magn./Phase |
| Measurements    | 1           |
| Delay in TR     | 0 ms        |
| Multiple series | Off         |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 220 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.00 mm |
| Base resolution       | 192     |
| Phase resolution      | 100 %   |
| Phase partial Fourier | 6/8     |
| Interpolation         | Off     |

### Resolution - iPAT

|          |        |
|----------|--------|
| PAT mode | GRAPPA |
|----------|--------|

### Resolution - iPAT

|                     |             |
|---------------------|-------------|
| Accel. factor PE    | 2           |
| Ref. lines PE       | 40          |
| Reference scan mode | Single-shot |

### Resolution - Filter Image

|                     |     |
|---------------------|-----|
| Distortion Corr.    | Off |
| Prescan Normalize   | On  |
| Dynamic Field Corr. | Off |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | Off |
| Elliptical filter | Off |

### Geometry - Common

|                          |             |
|--------------------------|-------------|
| Slice group              | 1           |
| Slices                   | 27          |
| Dist. factor             | 30 %        |
| Position                 | Isocenter   |
| Orientation              | Transversal |
| Phase enc. dir.          | A >> P      |
| FoV read                 | 220 mm      |
| FoV phase                | 100.0 %     |
| Slice thickness          | 4.00 mm     |
| TR                       | 3800 ms     |
| Multi-slice mode         | Interleaved |
| Series                   | Interleaved |
| Multi-band accel. factor | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slice group         | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | A >> P      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 0.00 deg    |
| Initial Orientation | Transversal |

### Geometry - Saturation

|                       |          |
|-----------------------|----------|
| Fat suppr.            | Fat sat. |
| Grad. rev. fat suppr. | Enabled  |
| Special sat.          | None     |

### Geometry - Navigator

### System - Miscellaneous

|                     |                |
|---------------------|----------------|
| Positioning mode    | REF            |
| Table position      | H              |
| Table position      | 0 mm           |
| MSMA                | S - C - T      |
| Sagittal            | R >> L         |
| Coronal             | A >> P         |
| Transversal         | F >> H         |
| Coil Combine Mode   | Sum of Squares |
| Matrix Optimization | Off            |

**System - Miscellaneous**

|                  |         |
|------------------|---------|
| AutoAlign        | ---     |
| Coil Select Mode | Default |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 220 mm      |
| R >> L      | 220 mm      |
| F >> H      | 140 mm      |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
| Excitation   | Standard |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                          |         |
|--------------------------|---------|
| 1st Signal/Mode          | None    |
| TR                       | 3800 ms |
| Multi-band accel. factor | 1       |

**Physio - PACE**

|                          |     |
|--------------------------|-----|
| Resp. control            | Off |
| Multi-band accel. factor | 1   |

**Diff - Neuro**

|                       |                        |
|-----------------------|------------------------|
| Diffusion mode        | MDDW                   |
| Diff. directions      | 6                      |
| Diffusion Scheme      | Bipolar                |
| Diff. weightings      | 2                      |
| b-value 1             | 0 s/mm <sup>2</sup>    |
| b-value 2             | 1000 s/mm <sup>2</sup> |
| b-value 1             | 1                      |
| b-value 2             | 1                      |
| Diff. weighted images | On                     |
| Trace weighted images | On                     |
| ADC maps              | On                     |
| FA maps               | On                     |
| Mosaic                | On                     |
| Tensor                | On                     |
| Noise level           | 40                     |

**Diff - Body**

|                  |         |
|------------------|---------|
| Diffusion mode   | MDDW    |
| Diff. directions | 6       |
| Diffusion Scheme | Bipolar |

**Diff - Body**

|                       |                        |
|-----------------------|------------------------|
| Diff. weightings      | 2                      |
| b-value 1             | 0 s/mm <sup>2</sup>    |
| b-value 2             | 1000 s/mm <sup>2</sup> |
| b-value 1             | 1                      |
| b-value 2             | 1                      |
| Diff. weighted images | On                     |
| Trace weighted images | On                     |
| ADC maps              | On                     |
| Exponential ADC Maps  | Off                    |
| FA maps               | On                     |
| Invert Gray Scale     | Off                    |
| Calculated Image      | Off                    |
| b-Value >=            | 0 s/mm <sup>2</sup>    |
| Noise level           | 40                     |

**Diff - Composing**

|                  |     |
|------------------|-----|
| Distortion Corr. | Off |
|------------------|-----|

**Sequence - Part 1**

|                   |             |
|-------------------|-------------|
| Introduction      | Off         |
| Multi-slice mode  | Interleaved |
| Free echo spacing | Off         |
| Echo spacing      | 0.78 ms     |
| Bandwidth         | 1446 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 192         |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Excitation    | Standard    |
| RF spoiling   | Off         |

**Sequence - Special**

|                          |      |
|--------------------------|------|
| SENSE1 coil combine      | On   |
| Invert RO/PE polarity    | Off  |
| Force Maxwell corr.      | Off  |
| PF omits higher k-space  | Off  |
| Disable freq. update     | Off  |
| Force equal slice timing | Off  |
| FFT scale factor         | 1.00 |
| Physio recording         | Off  |

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\pasl\_3d\_tra \***

TA: 0:20 PM: ISO Voxel size: 1.9×1.9×4.5 mmRel. SNR: 1.00 : tgse

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                    |   |
|--------------------|---|
| Slab group         | 1   |
| Slabs              | 1   |
| Dist. factor       | 50 %  |
| Position           | Isocenter   |
| Orientation        | Transversal   |
| Phase enc. dir.    | P >> A  |
| AutoAlign          | ---   |
| Phase oversampling | 0 %   |
| Slice oversampling | 0.0 %   |
| Slices per slab    | 16  |
| FoV read           | 240 mm  |
| FoV phase          | 100.0 %   |
| Slice thickness    | 4.50 mm   |
| TR                 | 2000 ms   |
| TE                 | 20.26 ms  |
| Averages           | 1   |
| Concatenations     | 1   |
| Filter             | Raw filter, Distortion<br>Corr.(2D), Prescan<br>Normalize |
| Coil elements      | HE1-4   |

### Contrast - Common

|            |          |
|------------|----------|
| TR         | 2000 ms  |
| TE         | 20.26 ms |
| Flip angle | 180 deg  |
| Fat suppr. | Fat sat. |

### Contrast - Dynamic

|                 |           |
|-----------------|-----------|
| Averages        | 1         |
| Averaging mode  | Long term |
| Reconstruction  | Magnitude |
| Measurements    | 2         |
| Delay in TR     | 0 ms      |
| Multiple series | Off       |

### Contrast - ASL

|                      |            |
|----------------------|------------|
| Perfusion mode       | FAIR QII   |
| Suppression Mode     | GRAY-WHITE |
| Bolus Duration       | 800 ms     |
| Inversion Time       | 1000 ms    |
| Averaging mode       | CONSTANT   |
| Inversion Array Size | 1          |

### Resolution - Common

|                       |         |
|-----------------------|---------|
| FoV read              | 240 mm  |
| FoV phase             | 100.0 % |
| Slice thickness       | 4.50 mm |
| Base resolution       | 64      |
| Phase resolution      | 97 %    |
| Phase partial Fourier | Off     |
| Slice partial Fourier | Off     |
| Interpolation         | On      |

### Resolution - Filter Image

|                   |    |
|-------------------|----|
| Distortion Corr.  | On |
| Mode              | 2D |
| Prescan Normalize | On |

### Resolution - Filter Rawdata

|                   |     |
|-------------------|-----|
| Raw filter        | On  |
| Elliptical filter | Off |
| Hamming           | Off |

### Geometry - Common

|                    |             |
|--------------------|-------------|
| Slab group         | 1           |
| Slabs              | 1           |
| Dist. factor       | 50 %        |
| Position           | Isocenter   |
| Orientation        | Transversal |
| Phase enc. dir.    | P >> A      |
| Slice oversampling | 0.0 %       |
| Slices per slab    | 16          |
| FoV read           | 240 mm      |
| FoV phase          | 100.0 %     |
| Slice thickness    | 4.50 mm     |
| TR                 | 2000 ms     |
| Multi-slice mode   | Interleaved |
| Series             | Ascending   |
| Concatenations     | 1           |

### Geometry - AutoAlign

|                     |             |
|---------------------|-------------|
| Slab group          | 1           |
| Position            | Isocenter   |
| Orientation         | Transversal |
| Phase enc. dir.     | P >> A      |
| AutoAlign           | ---         |
| Initial Position    | Isocenter   |
| L                   | 0.0 mm      |
| P                   | 0.0 mm      |
| H                   | 0.0 mm      |
| Initial Rotation    | 180.00 deg  |
| Initial Orientation | Transversal |

### Geometry - Saturation

|              |          |
|--------------|----------|
| Fat suppr.   | Fat sat. |
| Special sat. | None     |

### System - Miscellaneous

|                  |           |
|------------------|-----------|
| Positioning mode | ISO       |
| Table position   | H         |
| Table position   | 0 mm      |
| MSMA             | S - C - T |
| Sagittal         | R >> L    |

**System - Miscellaneous**

|                     |                |
|---------------------|----------------|
| Coronal             | A >> P         |
| Transversal         | F >> H         |
| Coil Combine Mode   | Sum of Squares |
| Matrix Optimization | Off            |
| AutoAlign           | ---            |
| Coil Select Mode    | Off - All      |

**System - Adjustments**

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Standard |
| B1 Shim mode             | TrueForm |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | Off      |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | -180.00 deg |
| A >> P      | 240 mm      |
| R >> L      | 240 mm      |
| F >> H      | 72 mm       |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
|--------------|----------|

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Correction factor   | 1              |
| Gain                | Low            |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Physio - Signal1**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 2000 ms |
| Concatenations  | 1       |
| Segments        | 2       |

**Sequence - Part 1**

|                  |             |
|------------------|-------------|
| Introduction     | Off         |
| Dimension        | 3D          |
| Reordering       | Centric     |
| Multi-slice mode | Interleaved |
| Echo spacing     | 0.49 ms     |
| Bandwidth        | 2442 Hz/Px  |

**Sequence - Part 2**

|               |             |
|---------------|-------------|
| EPI factor    | 31          |
| Segments      | 2           |
| RF pulse type | Normal      |
| Gradient mode | Performance |
| Turbo factor  | 16          |

**\\USER\2019\_MBC\_PROTOCOLS\_VE11C\SB.2002.60 MR DEVELOPMENT - RS\SB.2002.60 MR DEVELOPMENT - PROTOCOLQC - 111\csi\_slaser \***

TA: 0:37 PM: REF Voxel size: 20.0×20.0×20.0 mmRel. SNR: 1.00 : csi\_slaser

### Properties

|   |                    |
|---|--------------------|
| Prio recon                                    | Off                |
| Load images to viewer                         | On                 |
| Inline movie                                  | Off                |
| Auto store images                             | On                 |
| Load images to stamp segments                 | Off                |
| Load images to graphic segments               | Off                |
| Auto open inline display                      | Off                |
| Auto close inline display                     | Off                |
| Start measurement without further preparation | On                 |
| Wait for user to start                        | Off                |
| Start measurements                            | Single measurement |

### Routine

|                  |                            |
|------------------|----------------------------|
| Position         | Isocenter                  |
| Orientation      | Transversal                |
| Rotation         | 0 deg                      |
| Slices           | 1                          |
| Vol A >> P       | 100 mm                     |
| Vol R >> L       | 80 mm                      |
| FoV A >> P       | 160 mm                     |
| FoV R >> L       | 160 mm                     |
| Thickness F >> H | 20 mm                      |
| TR               | 1200 ms                    |
| TE               | 50 ms                      |
| Averages         | 1                          |
| Filter           | Prescan Normalize, Hamming |
| Coil elements    | HE1-4                      |

### Contrast

|                 |                   |
|-----------------|-------------------|
| TR              | 1200 ms           |
| TE              | 50 ms             |
| Averages        | 1                 |
| Averaging mode  | Long term         |
| Flip angle      | 65 deg            |
| Water suppr.    | Weak water suppr. |
| Water suppr. BW | 50 Hz             |
| Measurements    | 1                 |

### Resolution - Common

|                       |        |
|-----------------------|--------|
| FoV R >> L            | 160 mm |
| FoV A >> P            | 160 mm |
| Thickness F >> H      | 20 mm  |
| Scan res. R >> L      | 8      |
| Scan res. A >> P      | 8      |
| Interpol. res. R >> L | 8      |
| Interpol. res. A >> P | 8      |
| Hamming               | On     |
| Width                 | 50     |
| Prescan Normalize     | On     |
| Vector size           | 256    |

### Geometry - Common

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0 deg       |
| FoV R >> L  | 160 mm      |
| FoV A >> P  | 160 mm      |

### Geometry - Common

|                   |                    |
|-------------------|--------------------|
| Thickness F >> H  | 20 mm              |
| Vol R >> L        | 80 mm              |
| Vol A >> P        | 100 mm             |
| Sat. region       | 1                  |
| Thickness         | 40 mm              |
| Position          | L61.0 P0.0 H0.0 mm |
| Orientation       | Sagittal           |
| Sat. delta frequ. | -3.40 ppm          |
| Sat. region       | 2                  |
| Thickness         | 40 mm              |
| Position          | R61.0 P0.0 H0.0 mm |
| Orientation       | Sagittal           |
| Sat. delta frequ. | -3.40 ppm          |
| Sat. region       | 3                  |
| Thickness         | 40 mm              |
| Position          | L0.0 P61.0 H0.0 mm |
| Orientation       | Coronal            |
| Sat. delta frequ. | -3.40 ppm          |
| Sat. region       | 4                  |
| Thickness         | 40 mm              |
| Position          | L0.0 A61.0 H0.0 mm |
| Orientation       | Coronal            |
| Sat. delta frequ. | -3.40 ppm          |

### Geometry - AutoAlign

|                     |              |
|---------------------|--------------|
| Slice group         | 1            |
| Position            | Isocenter    |
| Orientation         | Transversal  |
| Phase enc. dir.     | A >> P       |
| AutoAlign           | Head > Brain |
| Initial Position    | Isocenter    |
| L                   | 0.0 mm       |
| P                   | 0.0 mm       |
| H                   | 0.0 mm       |
| Initial Rotation    | 90.00 deg    |
| Initial Orientation | Transversal  |

### System - Miscellaneous

|                  |              |
|------------------|--------------|
| Positioning mode | REF          |
| Table position   | H            |
| Table position   | 0 mm         |
| MSMA             | S - C - T    |
| Sagittal         | R >> L       |
| Coronal          | A >> P       |
| Transversal      | F >> H       |
| Save uncombined  | Off          |
| AutoAlign        | Head > Brain |
| Coil Select Mode | Off - All    |

### System - Adjustments

|                          |          |
|--------------------------|----------|
| B0 Shim mode             | Brain    |
| B1 Shim mode             | TrueForm |
| Adj. water suppr.        | On       |
| Adjust with body coil    | Off      |
| Confirm freq. adjustment | On       |
| Only after freq. change  | On       |
| Assume Dominant Fat      | Off      |
| Assume Silicone          | Off      |
| Adjustment Tolerance     | Auto     |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 90.00 deg   |
| R >> L      | 80 mm       |
| A >> P      | 100 mm      |
| F >> H      | 20 mm       |
| Reset       | Off         |

**System - pTx Volumes**

|              |          |
|--------------|----------|
| B1 Shim mode | TrueForm |
|--------------|----------|

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 123.237781 MHz |
| Gain                | High           |
| Img. Scale Cor.     | 1.000          |
| Reset               | Off            |
| ? Ref. amplitude 1H | 0.000 V        |

**Sequence - Common**

|                      |           |
|----------------------|-----------|
| Preparation scans    | 2         |
| Dimension            | 2D        |
| Delta frequency      | -2.70 ppm |
| Phase encoding       | Weighted  |
| Bandwidth            | 2000 Hz   |
| Acquisition duration | 128 ms    |
| Remove oversampling  | Off       |