

McLeod Pavilion

Protocol: adult\_head\_MRV BRAIN

|                    |                         |                         |  |                              |
|--------------------|-------------------------|-------------------------|--|------------------------------|
| 3-Plane Localizer  | <b>PATIENT POSITION</b> |                         | <b>IMAGING PARAMETERS</b>  |                              |
|                    | Patient Entry           | Head First              | Imaging Mode   | 2D                           |
|                    | Patient Position        | Supine                  | Pulse Sequence   | Spin Echo                    |
|                    | Coil Configuration      | 48Ch Head Coil          | Imaging Options  | Seq, EDR, TRF, Fast, SS, ARC |
|                    | Plane                   | 3-PLANE                 | <b>SCAN RANGE</b>  |                              |
|                    | Series Description      | 3-Plane Localizer       | FOV  | 30.0                         |
|                    | <b>SCAN TIMING</b>      |                         | Slice Thickness  | 10.0                         |
|                    | TE                      | 80.0                    | Slice Spacing  | 5.0                          |
|                    | Number of Echoes        | 1                       | <b>ACQ TIMING</b>  |                              |
|                    | TR                      | 1000.0                  | Freq   | 256                          |
|                    | Receiver Bandwidth      | 83.33                   | Phase  | 128                          |
|                    | <b>IMAGE ENHANCE</b>    |                         | Freq DIR   | Unswap                       |
|                    | Filter Choice           | None                    | # of Acq. Before Pause   | 0                            |
|                    | <b>GATING/TRIGGER</b>   |                         | Phase FOV  | 1.00                         |
|                    | Auto Trigger Type       | Off                     | Auto Shim  | Auto                         |
| <b>MULTI-PHASE</b> |                         | Phase Correction        | No   |                              |
| Seperate Series    | 0                       | <b>FMRI</b>             |  |                              |
| Mask Phase         | 0                       | PSD Trigger             | Internal   |                              |
| Mask Pause         | 0                       | View Order              | Bottom/Up  |                              |
| <b>DIFFUSION</b>   |                         | # of Repetitions REST   | 0  |                              |
| Recon All Images   | On                      | # of Repetitions ACTIVE | 0  |                              |
| <b>CONTRAST</b>    |                         | <b>SAT</b>              |  |                              |
| Contrast Yes/No    | No                      | Tag Type                | None   |                              |
|                    |                         | <b>TRICKS</b>           |  |                              |
|                    |                         | Pause On/Off            | On   |                              |
|                    |                         | Auto Subtract           | 0  |                              |
|                    |                         | Auto SCIC               | Off  |                              |
|                    |                         | <b>OTHERS</b>           |  |                              |
|                    |                         | Protocol Notes          | <p><i>Important Tip:<br/>Improve Head SAR performance will be seen with during a brain exam if the SSFSE localizer calculation is lower than 3.2 W/kg<br/>Keep the TR at 1000 msec in order to lower SAR estimations</i></p> |                              |

3-Plane Localizer

**WB-SAR: 0.68 Head-SAR: 2.0**

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|                         |                         |                         |                           |                  |
|-------------------------|-------------------------|-------------------------|---------------------------|------------------|
| 3D Sag Inhance Velocity | <b>PATIENT POSITION</b> |                         | <b>IMAGING PARAMETERS</b> |                  |
|                         | Patient Entry           | Head First              | Imaging Mode              | 3D               |
|                         | Patient Position        | Supine                  | Pulse Sequence            | Inhance Velocity |
|                         | Coil Configuration      | 48Ch Head Coil          | Imaging Options           | ZIP2, Asset      |
|                         | Plane                   | SAGITTAL                | <b>SCAN RANGE</b>         |                  |
|                         | Series Description      | 3D Sag Inhance Velocity | FOV                       | 24.0             |
|                         | <b>SCAN TIMING</b>      |                         | Slice Thickness           | 1.2              |
|                         | Flip Angle              | 8                       | <b>ACQ TIMING</b>         |                  |
|                         | TE                      | Minimum                 | Freq                      | 384              |
|                         | Number of Echoes        | 1                       | Phase                     | 224              |
|                         | TR                      | Minimum                 | Freq DIR                  | S/I              |
|                         | Receiver Bandwidth      | 31.25                   | Phase FOV                 | 0.90             |
|                         | <b>IMAGE ENHANCE</b>    |                         | Auto Shim                 | Auto             |
|                         | Filter Choice           | None                    | Phase Correction          | No               |
|                         | <b>GATING/TRIGGER</b>   |                         | <b>USER CVS</b>           |                  |
|                         | Auto Trigger Type       | Off                     | User CV23                 | 80.00            |
|                         | <b>FMRI</b>             |                         | <b>MULTI-PHASE</b>        |                  |
|                         | PSD Trigger             | Internal                | Seperate Series           | 0                |
|                         | View Order              | Bottom/Up               | Mask Phase                | 0                |
|                         | # of Repetitions REST   | 0                       | Mask Pause                | 0                |
|                         | # of Repetitions ACTIVE | 0                       | <b>VASCULAR</b>           |                  |
|                         | <b>SAT</b>              |                         | # of Collapse Images      | On               |
|                         | Tag Type                | None                    | # of Projection Images    | 0                |
|                         | <b>DIFUSION</b>         |                         | Flow Analysis             | All              |
|                         | Recon All Images        | On                      | Additional Flow Images    | 8                |
|                         | <b>CONTRAST</b>         |                         | Flow Recon Type           | Complex Diff.    |
| Contrast Yes/No         | No                      | Velocity Encoding       | 8.0                       |                  |
|                         |                         | <b>TRICKS</b>           |                           |                  |
|                         |                         | Pause On/Off            | On                        |                  |
|                         |                         | Auto Subtract           | 0                         |                  |
|                         |                         | Auto SCIC               | Off                       |                  |

3D Sag Inhance Velocity

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| PATIENT POSITION        |                       | IMAGING PARAMETERS |                                  |
|-------------------------|-----------------------|--------------------|----------------------------------|
| Patient Entry           | Head First            | Imaging Mode       | 3D                               |
| Patient Position        | Supine                | Pulse Sequence     | Cube                             |
| Coil Configuration      | 48Ch Head Coil        | Imaging Options    | EDR, Fast, ZIP512, ZIP2, FR, ARC |
| Plane                   | OBLIQUE               |                    |                                  |
| Series Description      | 3D Sag T1 Cube FATSAT |                    |                                  |
| SCAN TIMING             |                       | SCAN RANGE         |                                  |
| TE                      | Minimum               | FOV                | 25.6                             |
| Number of Echoes        | 1                     | Slice Thickness    | 1.2                              |
| TR                      | 550.0                 | Location per Slab  | 140                              |
| Echo Train Length       | 22                    | Overlap Locations  | 0                                |
| Receiver Bandwidth      | 62.50                 |                    |                                  |
| IMAGE ENHANCE           |                       | ACQ TIMING         |                                  |
| Filter Choice           | G                     | Freq               | 256                              |
|                         |                       | Phase              | 256                              |
| GATING/TRIGGER          |                       | Freq DIR           | S/I                              |
| Auto Trigger Type       | Off                   | NEX                | 1.00                             |
|                         |                       | Phase FOV          | 0.95                             |
| FMRI                    |                       | Auto Shim          | Auto                             |
| PSD Trigger             | Internal              | Phase Correction   | No                               |
| View Order              | Bottom/Up             | USER CVS           |                                  |
| # of Repetitions REST   | 0                     | User CV5           | 1.00                             |
| # of Repetitions ACTIVE | 0                     | User CV22          | 3.00                             |
| SAT                     |                       | MULTI-PHASE        |                                  |
| Tag Type                | None                  | Seperate Series    | 0                                |
| Fat/Water Saturation    | Fat                   | Mask Phase         | 0                                |
|                         |                       | Mask Pause         | 0                                |
| TRICKS                  |                       | DIFFUSION          |                                  |
| Pause On/Off            | On                    | Recon All Images   | On                               |
| Auto Subtract           | 0                     |                    |                                  |
| Auto SCIC               | Off                   | CONTRAST           |                                  |
|                         |                       | Contrast Yes/No    | No                               |

3D Sag T1 Cube FATSAT

3D Sag T1 Cube FATSAT

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|                         |                          |                                |                |
|-------------------------|--------------------------|--------------------------------|----------------|
| <b>PATIENT POSITION</b> |                          | <b>IMAGING PARAMETERS</b>      |                |
| Patient Entry           | Head First               | Imaging Mode                   | 2D             |
| Patient Position        | Supine                   | Pulse Sequence                 | Spin Echo      |
| Coil Configuration      | 48Ch Head Coil;Head;Neck | Imaging Options                | EDR, EPI, DIFF |
| Plane                   | OBLIQUE                  | <b>SCAN RANGE</b>              |                |
| Series Description      | Cor FOCUS ALL B-1000     | FOV                            | 18.0           |
| <b>SCAN TIMING</b>      |                          | Slice Thickness                | 3.0            |
| TE                      | Minimum                  | Slice Spacing                  | 0.0            |
| Number of Echoes        | 1                        | <b>ACQ TIMING</b>              |                |
| TR                      | 4000.0                   | Freq                           | 120            |
| Number of Shots         | 1                        | Phase                          | 60             |
| <b>IMAGE ENHANCE</b>    |                          | Freq DIR                       | S/I            |
| Filter Choice           | None                     | Phase FOV                      | 0.50           |
| <b>GATING/TRIGGER</b>   |                          | Auto Shim                      | Auto           |
| Auto Trigger Type       | Off                      | Phase Correction               | Yes            |
| <b>FMRI</b>             |                          | <b>USER CVS</b>                |                |
| PSD Trigger             | Internal                 | User CV0                       | 1.00           |
| View Order              | Bottom/Up                | User CV5                       | 1.00           |
| # of Repetitions REST   | 0                        | User CV17                      | 1.00           |
| # of Repetitions ACTIVE | 0                        | <b>MULTI-PHASE</b>             |                |
| <b>SAT</b>              |                          | Seperate Series                | 0              |
| Tag Type                | None                     | Mask Phase                     | 0              |
| Fat/Water Saturation    | Fat                      | Mask Pause                     | 0              |
| <b>TRICKS</b>           |                          | <b>DIFFUSION</b>               |                |
| Pause On/Off            | On                       | Optimized TE                   | Yes            |
| Auto Subtract           | 0                        | Diffusion Directions           | All            |
| Auto SCIC               | Off                      | Number of Diffusion Directions | 3              |
|                         |                          | Number of T2 Images            | 1              |
|                         |                          | Dual Spin Echo                 | Off            |
|                         |                          | Recon All Images               | On             |
|                         |                          | <b>CONTRAST</b>                |                |
|                         |                          | Contrast Yes/No                | No             |

Cor FOCUS ALL B-1000

Cor FOCUS ALL B-1000

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| PATIENT POSITION        |                              | IMAGING PARAMETERS |                                  |
|-------------------------|------------------------------|--------------------|----------------------------------|
| Patient Entry           | Head First                   | Imaging Mode       | 3D                               |
| Patient Position        | Supine                       | Pulse Sequence     | Cube DIR                         |
| Coil Configuration      | 48Ch Head Coil;Head;Neck     | Imaging Options    | EDR, Fast, ZIP512, T2P, ARC, IrP |
| Plane                   | OBLIQUE                      |                    |                                  |
| Series Description      | 3D Sag T2 DIR Cube (WM Null) |                    |                                  |
| SCAN TIMING             |                              | SCAN RANGE         |                                  |
| TE                      | 90.0                         | FOV                | 25.6                             |
| Number of Echoes        | 1                            | Slice Thickness    | 1.3                              |
| TR                      | 7000.0                       | Location per Slab  | 130                              |
| TI                      | 2893                         | Overlap Locations  | 0                                |
| Echo Train Length       | 160                          |                    |                                  |
| Blood Suppression TI    | 547                          | ACQ TIMING         |                                  |
| Receiver Bandwidth      | 35.71                        | Freq               | 192                              |
|                         |                              | Phase              | 192                              |
|                         |                              | Freq DIR           | S/I                              |
|                         |                              | NEX                | 1.00                             |
|                         |                              | Phase FOV          | 0.95                             |
|                         |                              | Auto Shim          | Auto                             |
|                         |                              | Phase Correction   | No                               |
| IMAGE ENHANCE           |                              | USER CVS           |                                  |
| Filter Choice           | G                            | User CV5           | 1.00                             |
| GATING/TRIGGER          |                              | MULTI-PHASE        |                                  |
| Auto Trigger Type       | Off                          | Seperate Series    | 0                                |
|                         |                              | Mask Phase         | 0                                |
|                         |                              | Mask Pause         | 0                                |
| FMRI                    |                              | DIFFUSION          |                                  |
| PSD Trigger             | Internal                     | Recon All Images   | On                               |
| View Order              | Bottom/Up                    |                    |                                  |
| # of Repetitions REST   | 0                            | CONTRAST           |                                  |
| # of Repetitions ACTIVE | 0                            | Contrast Yes/No    | No                               |
| SAT                     |                              |                    |                                  |
| Tag Type                | None                         |                    |                                  |
| Fat/Water Saturation    | Fat                          |                    |                                  |
| TRICKS                  |                              |                    |                                  |
| Pause On/Off            | On                           |                    |                                  |
| Auto Subtract           | 0                            |                    |                                  |
| Auto SCIC               | 2                            |                    |                                  |

3D Sag T2 DIR Cube (WM Null)

3D Sag T2 DIR Cube (WM Null)

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| PATIENT POSITION        |                              | IMAGING PARAMETERS |                                  |
|-------------------------|------------------------------|--------------------|----------------------------------|
| Patient Entry           | Head First                   | Imaging Mode       | 3D                               |
| Patient Position        | Supine                       | Pulse Sequence     | Cube DIR                         |
| Coil Configuration      | 48Ch Head Coil;Head;Neck     | Imaging Options    | EDR, Fast, ZIP512, T2P, ARC, IrP |
| Plane                   | OBLIQUE                      |                    |                                  |
| Series Description      | 3D Sag T2 DIR Cube (WM Null) |                    |                                  |
| SCAN TIMING             |                              | SCAN RANGE         |                                  |
| TE                      | 90.0                         | FOV                | 25.6                             |
| Number of Echoes        | 1                            | Slice Thickness    | 1.3                              |
| TR                      | 7000.0                       | Location per Slab  | 130                              |
| TI                      | 3408                         | Overlap Locations  | 0                                |
| Echo Train Length       | 160                          |                    |                                  |
| Blood Suppression TI    | 847                          | ACQ TIMING         |                                  |
| Receiver Bandwidth      | 35.71                        | Freq               | 192                              |
|                         |                              | Phase              | 192                              |
|                         |                              | Freq DIR           | S/I                              |
|                         |                              | NEX                | 1.00                             |
|                         |                              | Phase FOV          | 0.95                             |
|                         |                              | Auto Shim          | Auto                             |
|                         |                              | Phase Correction   | No                               |
| IMAGE ENHANCE           |                              | USER CVS           |                                  |
| Filter Choice           | G                            | User CV5           | 1.00                             |
| GATING/TRIGGER          |                              | MULTI-PHASE        |                                  |
| Auto Trigger Type       | Off                          | Seperate Series    | 0                                |
|                         |                              | Mask Phase         | 0                                |
|                         |                              | Mask Pause         | 0                                |
| FMRI                    |                              | DIFFUSION          |                                  |
| PSD Trigger             | Internal                     | Recon All Images   | On                               |
| View Order              | Bottom/Up                    |                    |                                  |
| # of Repetitions REST   | 0                            | CONTRAST           |                                  |
| # of Repetitions ACTIVE | 0                            | Contrast Yes/No    | No                               |
| SAT                     |                              |                    |                                  |
| Tag Type                | None                         |                    |                                  |
| Fat/Water Saturation    | Fat                          |                    |                                  |
| TRICKS                  |                              |                    |                                  |
| Pause On/Off            | On                           |                    |                                  |
| Auto Subtract           | 0                            |                    |                                  |
| Auto SCIC               | 2                            |                    |                                  |

3D Sag T2 DIR Cube (WM Null)

3D Sag T2 DIR Cube (WM Null)

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|                    |                         |                         |  |                              |
|--------------------|-------------------------|-------------------------|--|------------------------------|
| *POST CONTRAST*    | <b>PATIENT POSITION</b> |                         | <b>IMAGING PARAMETERS</b>  |                              |
|                    | Patient Entry           | Head First              | Imaging Mode   | 2D                           |
|                    | Patient Position        | Supine                  | Pulse Sequence   | Spin Echo                    |
|                    | Coil Configuration      | Head;Neck               | Imaging Options  | Seq, EDR, TRF, Fast, SS, ARC |
|                    | Plane                   | 3-PLANE                 | <b>SCAN RANGE</b>  |                              |
|                    | Series Description      | *POST CONTRAST*         | FOV  | 30.0                         |
|                    | <b>SCAN TIMING</b>      |                         | Slice Thickness  | 10.0                         |
|                    | TE                      | 80.0                    | Slice Spacing  | 5.0                          |
|                    | Number of Echoes        | 1                       | <b>ACQ TIMING</b>  |                              |
|                    | TR                      | 1000.0                  | Freq   | 256                          |
|                    | Receiver Bandwidth      | 83.33                   | Phase  | 128                          |
|                    | <b>IMAGE ENHANCE</b>    |                         | Freq DIR   | Unswap                       |
|                    | Filter Choice           | None                    | # of Acq. Before Pause   | 0                            |
|                    | <b>GATING/TRIGGER</b>   |                         | Phase FOV  | 1.00                         |
|                    | Auto Trigger Type       | Off                     | Auto Shim  | Auto                         |
| <b>MULTI-PHASE</b> |                         | Phase Correction        | No   |                              |
| Seperate Series    | 0                       | <b>FMRI</b>             |  |                              |
| Mask Phase         | 0                       | PSD Trigger             | Internal   |                              |
| Mask Pause         | 0                       | Slice Order             | Interleaved  |                              |
| <b>DIFFUSION</b>   |                         | View Order              | Bottom/Up  |                              |
| Recon All Images   | On                      | # of Repetitions REST   | 0  |                              |
| <b>CONTRAST</b>    |                         | # of Repetitions ACTIVE | 0  |                              |
| Contrast Yes/No    | No                      | <b>SAT</b>              |  |                              |
|                    |                         | Tag Type                | None   |                              |
|                    |                         | <b>TRICKS</b>           |  |                              |
|                    |                         | Pause On/Off            | On   |                              |
|                    |                         | Auto Subtract           | 0  |                              |
|                    |                         | Auto SCIC               | Off  |                              |
|                    |                         | <b>OTHERS</b>           |  |                              |
|                    |                         | Protocol Notes          | <p><i>Important Tip:<br/>                     Improve Head SAR performance will be seen with during a brain exam if the SSFSE localizer calculation is lower than 3.2 W/kg<br/>                     Keep the TR at 1000 msec in order to lower SAR estimations</i></p> |                              |

WB-SAR: 0.68 Head-SAR: 2.0

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|                    |                         |                    |                           |                                     |
|--------------------|-------------------------|--------------------|---------------------------|-------------------------------------|
| + C 3D Ax T1 FSPGR | <b>PATIENT POSITION</b> |                    | <b>IMAGING PARAMETERS</b> |                                     |
|                    | Patient Entry           | Head First         | Imaging Mode              | 3D                                  |
|                    | Patient Position        | Supine             | Pulse Sequence            | SPGR                                |
|                    | Coil Configuration      | 48Ch Head Coil     | Imaging Options           | EDR, Fast, ZIP512, ZIP2, Asset, IrP |
|                    | Plane                   | OBLIQUE            | <b>SCAN RANGE</b>         |                                     |
|                    | Series Description      | + C 3D Ax T1 FSPGR | FOV                       | 24.0                                |
|                    | <b>SCAN TIMING</b>      |                    | Slice Thickness           | 1.2                                 |
|                    | Flip Angle              | 12                 | Location per Slab         | 130                                 |
|                    | TE                      | Min Full           | Overlap Locations         | 0                                   |
|                    | Number of Echoes        | 1                  | <b>ACQ TIMING</b>         |                                     |
|                    | TI                      | 450                | Freq                      | 256                                 |
|                    | Receiver Bandwidth      | 31.25              | Phase                     | 256                                 |
|                    | <b>IMAGE ENHANCE</b>    |                    | Freq DIR                  | Unswap                              |
|                    | Filter Choice           | G                  | NEX                       | 1.00                                |
|                    | <b>GATING/TRIGGER</b>   |                    | Phase FOV                 | 1.00                                |
|                    | Auto Trigger Type       | Off                | Auto Shim                 | Auto                                |
|                    | <b>FMRI</b>             |                    | Phase Correction          | No                                  |
|                    | Initial State           | Control            | <b>USER CVS</b>           |                                     |
|                    | PSD Trigger             | Internal           | User CV6                  | 2.00                                |
|                    | View Order              | Bottom/Up          | User CV23                 | 90.00                               |
|                    | # of Repetitions REST   | 0                  | <b>MULTI-PHASE</b>        |                                     |
|                    | # of Repetitions ACTIVE | 0                  | Seperate Series           | 0                                   |
|                    | <b>SAT</b>              |                    | Trigger Delay without AV  | 0                                   |
|                    | Tag Type                | None               | Mask Phase                | 0                                   |
|                    | <b>TRICKS</b>           |                    | Mask Pause                | 0                                   |
| Pause On/Off       | On                      | <b>DIFFUSION</b>   |                           |                                     |
| Auto Subtract      | 0                       | Recon All Images   | On                        |                                     |
| Auto SCIC          | 2                       | <b>CONTRAST</b>    |                           |                                     |
| <b>OTHERS</b>      |                         | Contrast Yes/No    | Yes                       |                                     |
| Protocol Notes     | HAND INJECT. MIP IMAGES |                    |                           |                                     |

+ C 3D Ax T1 FSPGR