

Managing SAR during MR scanning on Siemens Aera MRI

The patient should be informed that 'while we do not expect any issues during scanning, please press the staff call button should they experience any additional discomfort'. It is recommended to speak to the patient between scans to check all is ok

If the frame is outside the bore of the magnet or outside the transmission field of view if a local T/R coil that is being used (e.g. frame over ankle but T/R knee coil being used) then the scan can be conducted in normal operating mode.

However, the more likely scenario is outlined below.

When scanning a patient with the Hoffmann 3 frame, if the frame is inside the transmission field of view (i.e. within the bore when the body transmit coil and local receive coil is in use) then we should aim to have a whole body SAR of less than 1W/Kg for each sequence. Refer to figure 1 as to how to access SAR information on the Siemens Aera.

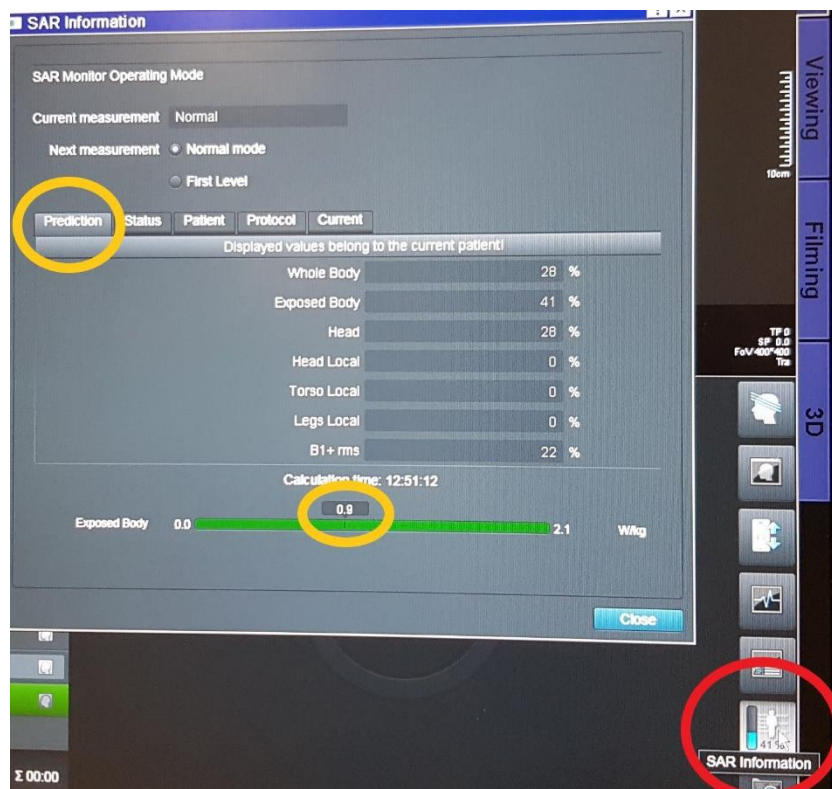


Figure 1: The red circle indicates where the SAR Information icon is located on the Siemens screen. Clicking on this opens the 'SAR Information' window as shown. Circled in orange are the SAR 'Prediction' tab and the predicted SAR value (0.9W/Kg in this case).

If the predicted SAR was greater than 1W/Kg then the following edits to the protocol can be done to bring SAR down. We suggest applying and reviewing the following suggestions to SAR changes one at a time such as to minimise the changes to protocol. See figure 2 on how to review changes to SAR. Further guidance is provided at the bottom of this page, but it is not expected these steps will be necessary in most instances

Choose low SAR pulses (In protocol: Sequence > Part 2 > Pulse type : 'low sar)

Reduce echo trains per slice (In protocol: Sequence > Part 2 > echo trains per slice)

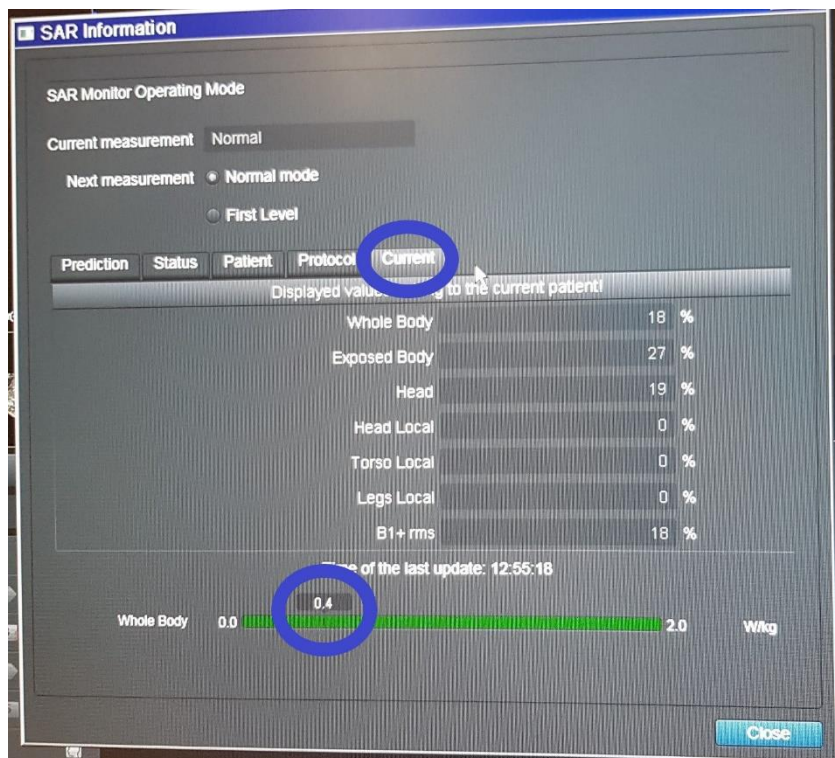


Figure 2: Following changes to the protocol check the 'current' SAR tab and current whole body SAR value (both circled in blue).

If you have applied the above changes and SAR is still not below 1W/Kg, you may wish to try some of the other options below. However, if you feel you have done all you can and made all reasonable changes, then we would recommend you proceed with scanning on the basis that SAR is as low as is reasonably practicable and the priority is that the patient get a diagnostic quality scan to progress their care.

General guidance on reducing SAR

A range of other options are available (points below have been generalised for all scanner vendors). These tips were taken from the following website which has a nice overview of SAR and B1+ rms and how to minimise them (https://www.ismrm.org/smrt/E-Signals/2016FEBRUARY/eSig_5_1_hot_2.htm)

- Utilize a "Low SAR" mode
- Increase the TR without reducing slices
- Reduce the number of slices for a given TR
- Reduce the Echo Train Length (ETL)
- Reduce the refocusing angle (FSE sequences)
- Reduce the flip angle (GRE sequences)
- Use a GRE sequence in place of a SE or FSE sequence

Note also that if you have several sequences with SAR > 1W/kg, interleaving these sequences with lower SAR sequences can help reduce the overall heating burden.