In neurosurgery, pre- and post-surgical monitoring is crucial in ensuring optimal conservation and recovery of cognitive function. A key focus during this process is on Broca’s and Wernicke’s areas (BWA), as impairment of these areas can negatively impact linguistic function and quality of life[1]. Task-based fMRI has detected a left-lateraled network that simultaneously engages BWA. This study will assess this network’s activation over a range of cognitive fMRI tasks to establish a baseline hemodynamic response (HDR) profile for this network.

**RESULTS**

**Lexical Decision Task**

- 59 healthy participants completed the Lexical Decision Task, where they had to decide whether each four-letter sequence represented a real English word or not.
- Word and non-word stimuli were shown at two levels of difficulty (Easy vs. Hard) resulting in four task conditions.

**Syllable Stress Task**

- Participants (n=32 healthy controls) were shown 48 two-syllable Dutch words. There were a total of 2 conditions.
- In the phonological condition, participants had to choose where the syllable stress was located.
- In the semantic condition, participants evaluated whether the word presented was positive or negative.

**Facial Emotion Discrimination Task**

- 21 healthy participants evaluated whether a presented face reflected a particular target emotion or age.
- Significant main effect of image type (p < .001)
- Significant main effect of discrimination condition (p < .001)

**CONCLUSION**

Activation of this network during the linguistic and emotion recognition tasks suggests that this network’s function lies in the extraction of linguistic- and emotion-based meaning. The derived task-specific HDR profiles will serve as a baseline against which a patient’s HDR profile can be compared to. This comparison will allow for the monitoring of linguistic changes in patients pre- and post-operation.

**REFERENCES**