A comparison of the P300 and PET in patients with disorders of consciousness in absence of response to command

#EPR2049

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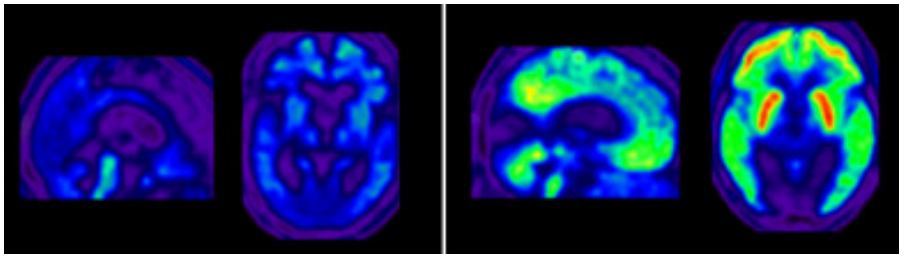
Study design

- 12 DOC patients without response to command
  - 8 UWS, 4 MCS-

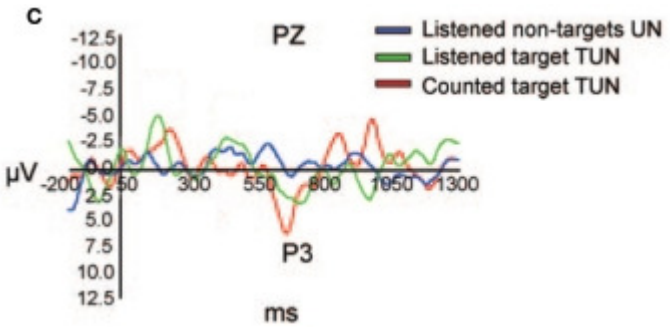
UWS MCS



Thibaut et al., *J Rehabil Med* 2012

- FDG-PET
  → Glucose metabolism

- P300 BCI
  - 70% True pos = good performance
  - VT2: 2 stimuli, 1 deviant
    → Not related to consciousness
  - VT3: 3 stimuli, 2 deviants of which 1 attended upon request
    → Command following, eventually communication



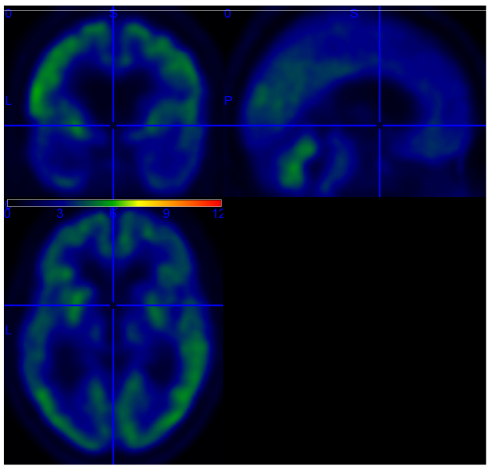
Schnakers et al., *Neurology* 2008

False positives?

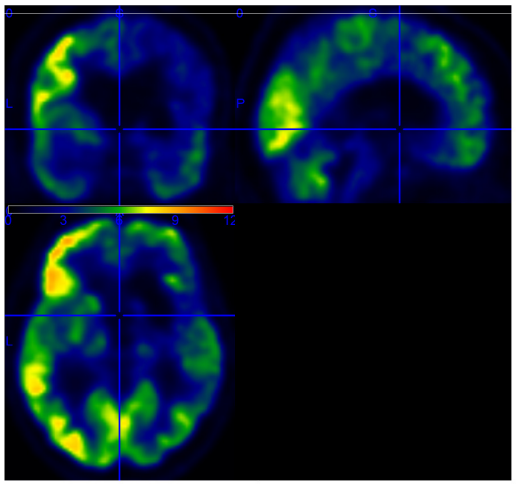
Signs of covert command following and preserved glucose metabolism

One patient (8%) with covert signs of command-follwing (>70%)
1/6 correct (and detected) answer for communication

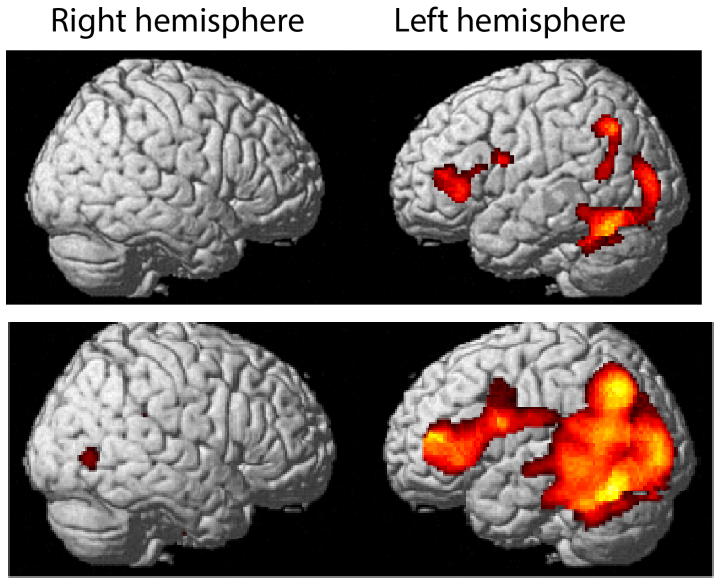
Average SUV of patients with MCS-like PET, no covert command following



SUV of patient with signs of covert command following



More preserved left language network in patient with signs of covert command following as compared to patients with MCS-like PET and healthy controls



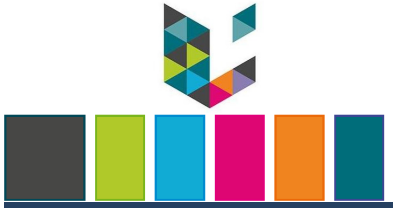
Conclusion

- 1/12 UWS/MCS- patients showed covert signs of command following

- Neuroimaging can confirm BCI results & reduce false positives
  →Clinical perspectives

- Future studies:
  - Repeated BCI acquisitions
  - Test communication paradigms in more patients

Thank you



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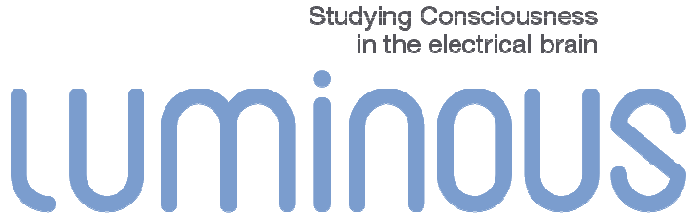
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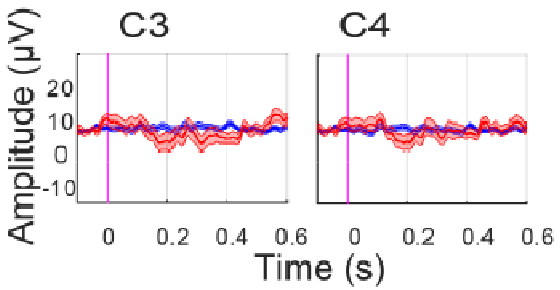
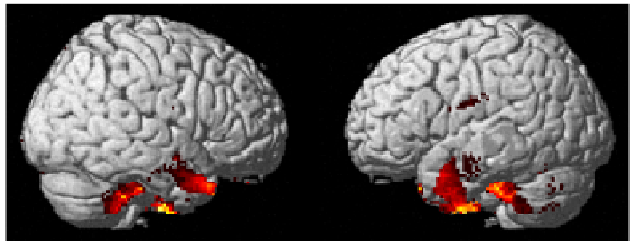
BCI accuracy UWS, PET UWS

Patient UWS 6

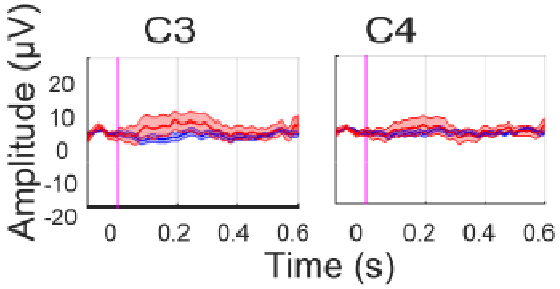


BCI VT2 accuracy: 0%

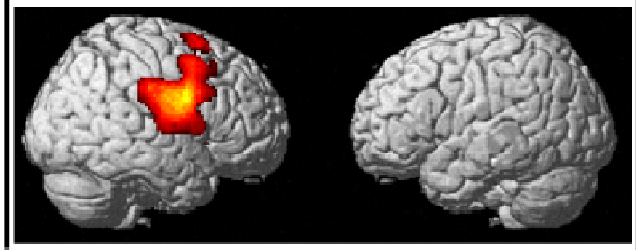


BCI accuracy UWS, PET MCS

Patient MCS- 2

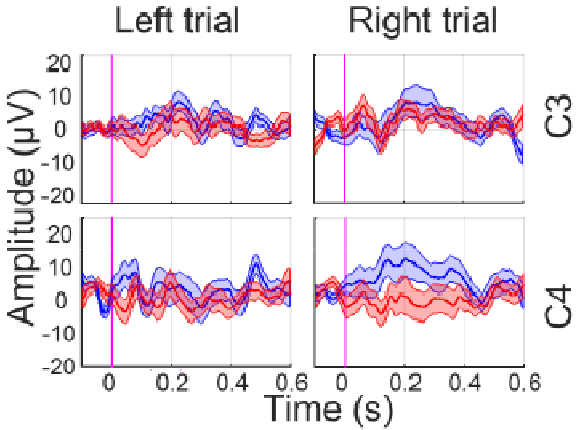
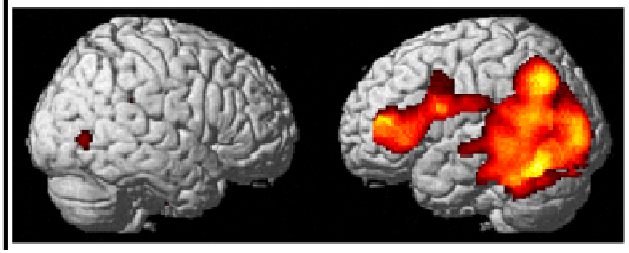


BCI VT2 accuracy: 20%



BCI accuracy MCS, PET MCS

Patient MCS- 1



BCI VT3 accuracy: 70%