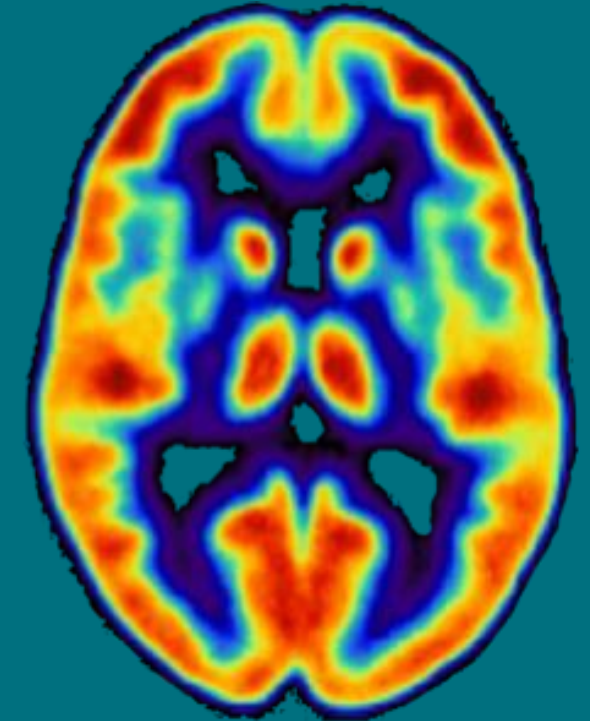
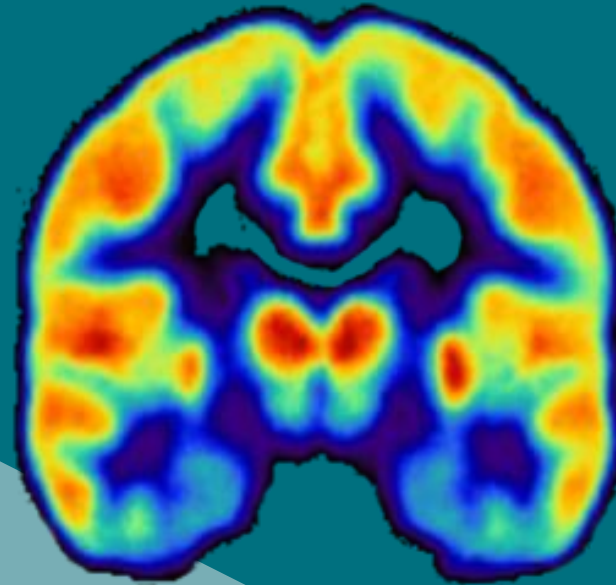
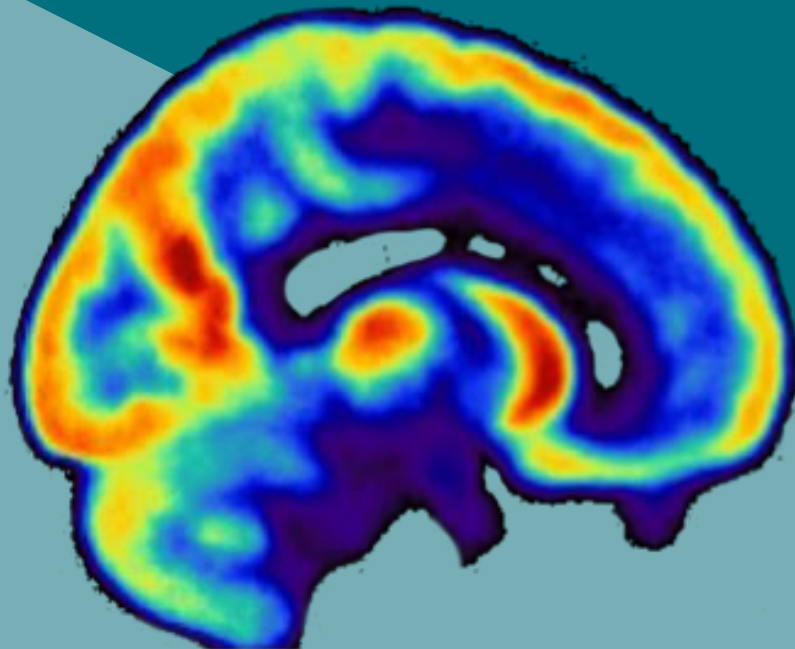


Development of an Automated Pipeline for the Analysis of [18F]FDG-PET Images in Disorders of Consciousness



Arianna Sala

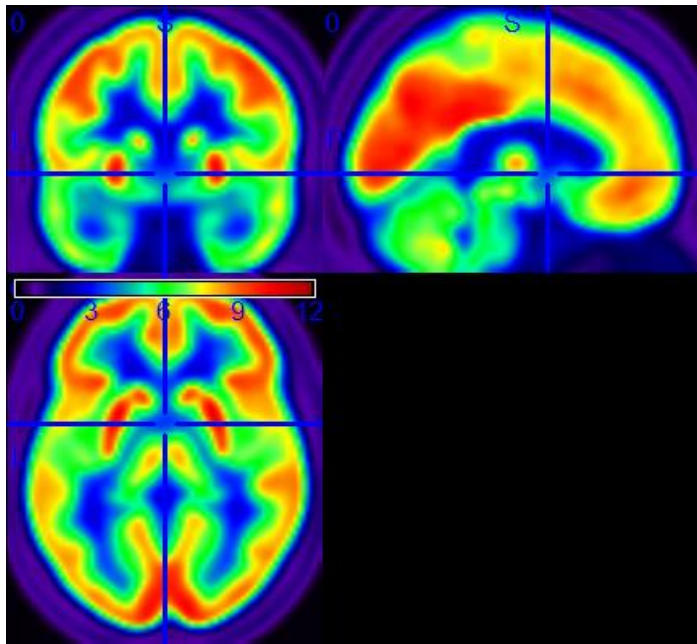
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arianna.sala@uliege.be

[18F]FDG-PET in Disorders of Consciousness

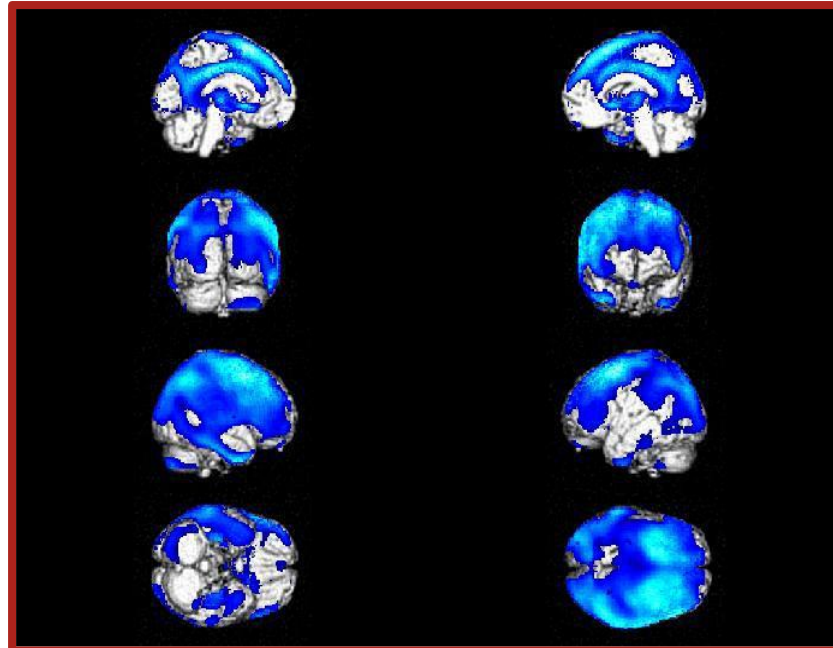


Global metabolism

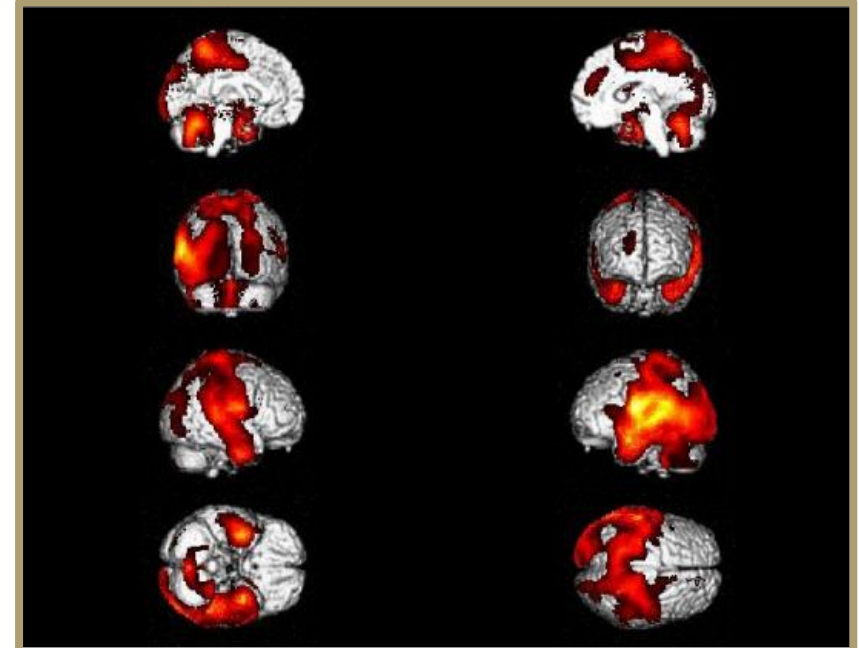


Decrease of 50-70% in DoC










Relative hypometabolism vs. **preservation** of regional metabolism



Hypometabolism in regions of internal and external awareness networks in DoC



European Academy of Neurology guideline on the diagnosis of coma and other disorders of consciousness

D. Kondziella^{a,b,c} , A. Bender^{d,e} , K. Diserens^f, W. van Erp^{g,h} , A. Estraneo^{i,j} , R. Formisano^k ,
S. Laureys^g , L. Naccache^{l,m}, S. Ozturkⁿ, B. Rohaut^{l,m,o} , J. D. Sitt^m, J. Stender^p, M. Tiainen^q,
A. O. Rossetti^{f,*}, O. Gosseries^{g,*} , and C. Chatelle^{g,r,*}  on behalf of the EAN Panel on Coma, Disorders
of Consciousness[†]

Clinical Translation ?

cognitive $f(x)$

y

$f(x)$

Co

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Wa
Sy





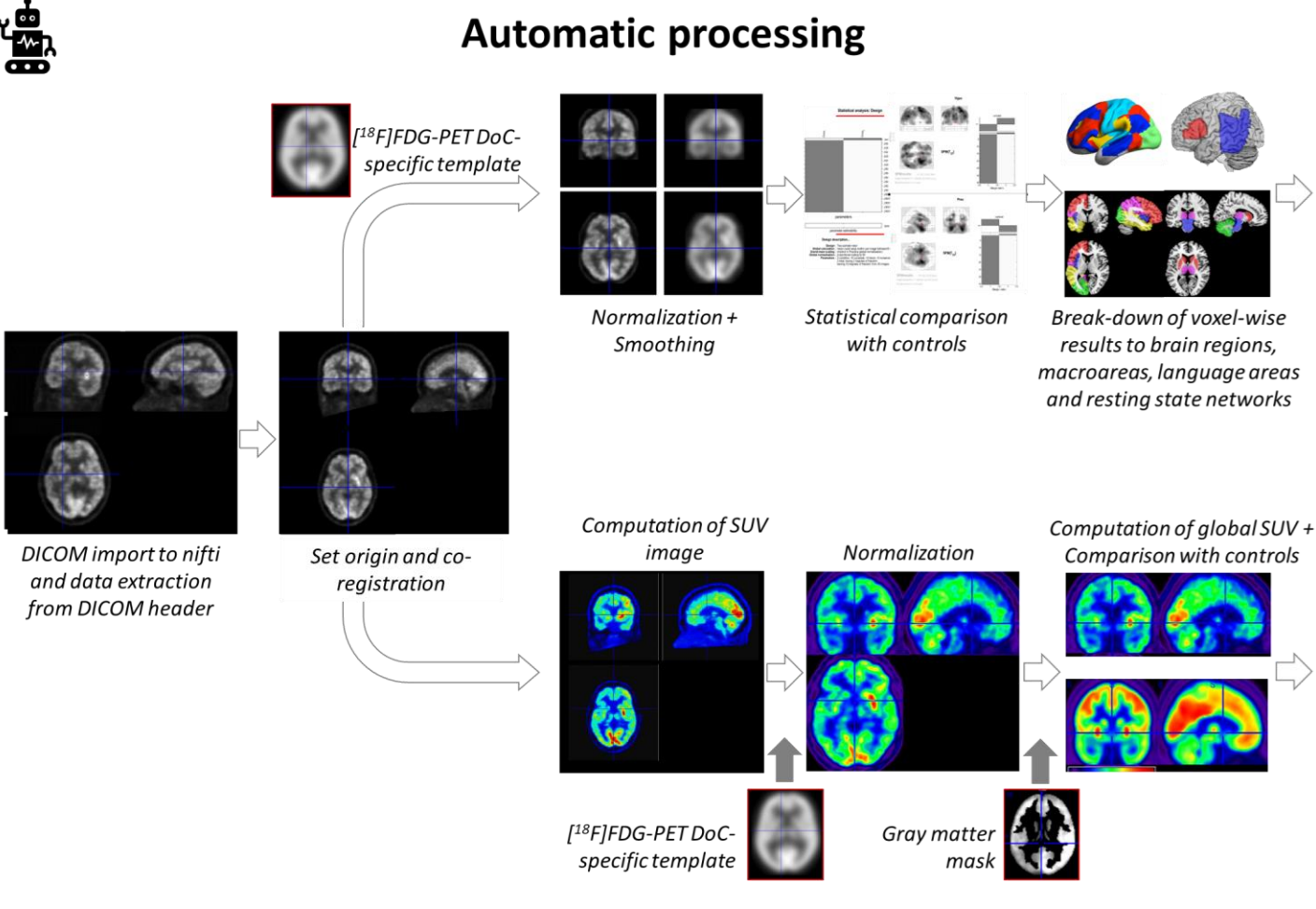
Automated pipeline

Input



Select patient's $[^{18}\text{F}]$ FDG-PET data

Automatic processing



DICOM import to nifti and data extraction from DICOM header

Set origin and co-registration

Normalization + Smoothing

Statistical comparison with controls

Break-down of voxel-wise results to brain regions, macroareas, language areas and resting state networks

Computation of SUV image

Normalization

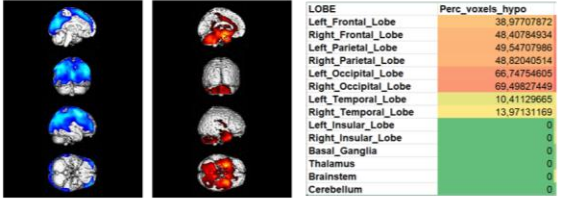
Computation of global SUV + Comparison with controls

$[^{18}\text{F}]$ FDG-PET DoC-specific template

Gray matter mask

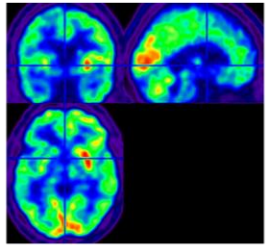
Output

1. SPM maps, summary statistics and renders



LOBE	Perc_voxels_hypo
Left_Frontal_Lobe	38.97707872
Right_Frontal_Lobe	48.40784934
Left_Parietal_Lobe	49.54707986
Right_Parietal_Lobe	48.82040514
Left_Occipital_Lobe	66.74754905
Right_Occipital_Lobe	59.49827449
Left_Temporal_Lobe	10.41129665
Right_Temporal_Lobe	13.97131169
Left_insular_Lobe	0
Right_insular_Lobe	0
Basal_Ganglia	0
Thalamus	0
Brainstem	0
Cerebellum	0

2. Global SUV, summary statistics and render



Decrease: 33%

≈ 1-2 minutes per patient

Get the pipeline



[tinyurl.com/
DOC-TOOLBOX](https://tinyurl.com/DOC-TOOLBOX)

Learn more



[tinyurl.com/
FDGPET-workshop](https://tinyurl.com/FDGPET-workshop)



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