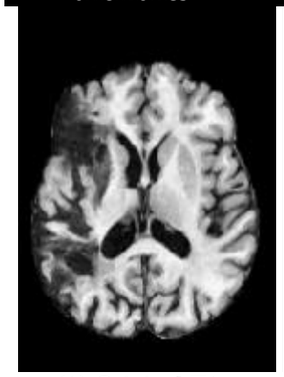
The 12 Features created from a single T1

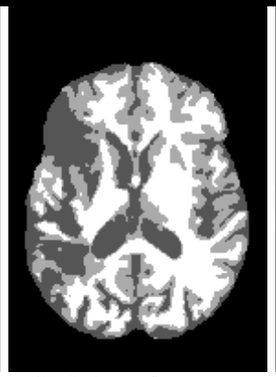
*Asterisks denote features included in the final algorithm.

Subject specific anomalies*



(1) Original T1 weighted image

Geometry*



(2) 3 tissue k-mean segmentation

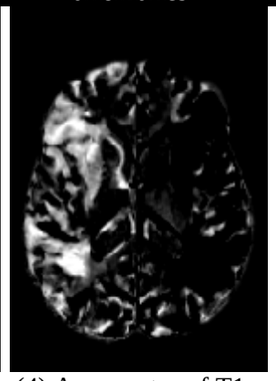
```
kmeansSegmentation(3, brainmask)$segmentation
```

Geometry*

(3) Gradient magnitude

```
iMath('Grad') %>%
iMath('Normalize')
```

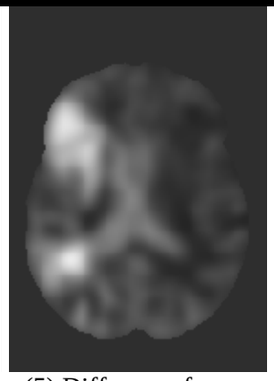
Subject specific anomalies



(4) Asymmetry of T1

```
refl.t1=reflectImage(t1, axis=1, tx='Affine')
iMath(refl.t1-t1, 'TruncateImageIntensity', 0.01, 0.99) %>%
iMath('Normalize')
```

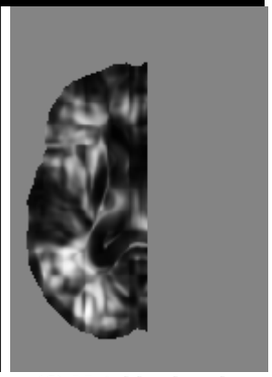
Atlas-based



(5) Difference from Template

```
(smoothImage(template,4) - smoothImage(t1, 4)) %>%
iMath('Normalize')
```

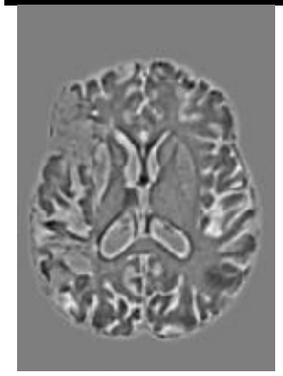
Atlas-based



(6) Neighborhood correlation with template

```
Custom long function
```

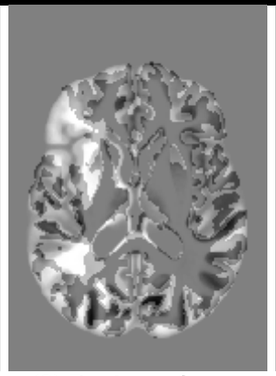
Geometry



(7) Laplacian

```
iMath('Laplacian')
```

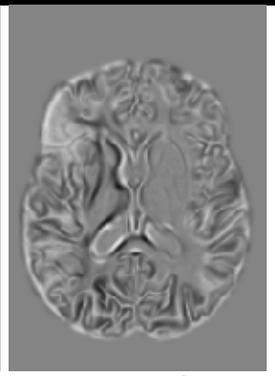
Control-based deviation*



(8) Deviance from controls for k-mean segmentation

```
(subject – conAverage) %>%
iMath('Normalize')
```

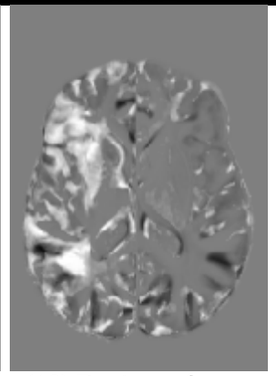
Control-based deviation



(9) Deviance from controls for gradient magnitude

```
(conAverage - subject) %>%
iMath('Normalize')
```

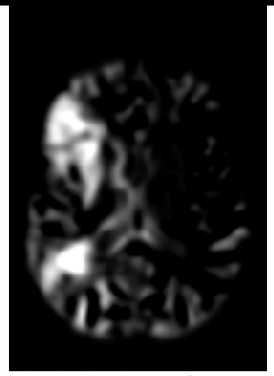
Control-based deviation*



(10) Deviance from controls for asymmetry of T1

```
(subject – conAverage) %>%
iMath('Normalize')
```

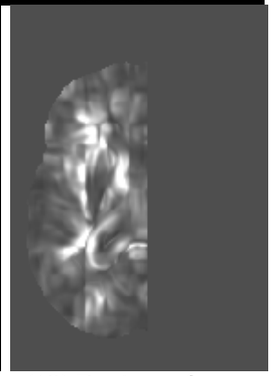
Control-based deviation*



(11) Deviance from controls for raw T1 image

```
subject =  smoothImage(t1,2) %>%
iMath('TruncateImageIntensity', 0.001, 0.999) %>%
iMath('Normalize')
(conAverage – subject) %>%
iMath('TruncateImageIntensity', 0.01, 0.99) %>%
iMath('Normalize')
```

Control-based deviation



(12) Deviance from controls for template neighborhood correlation

```
Custom long function
```