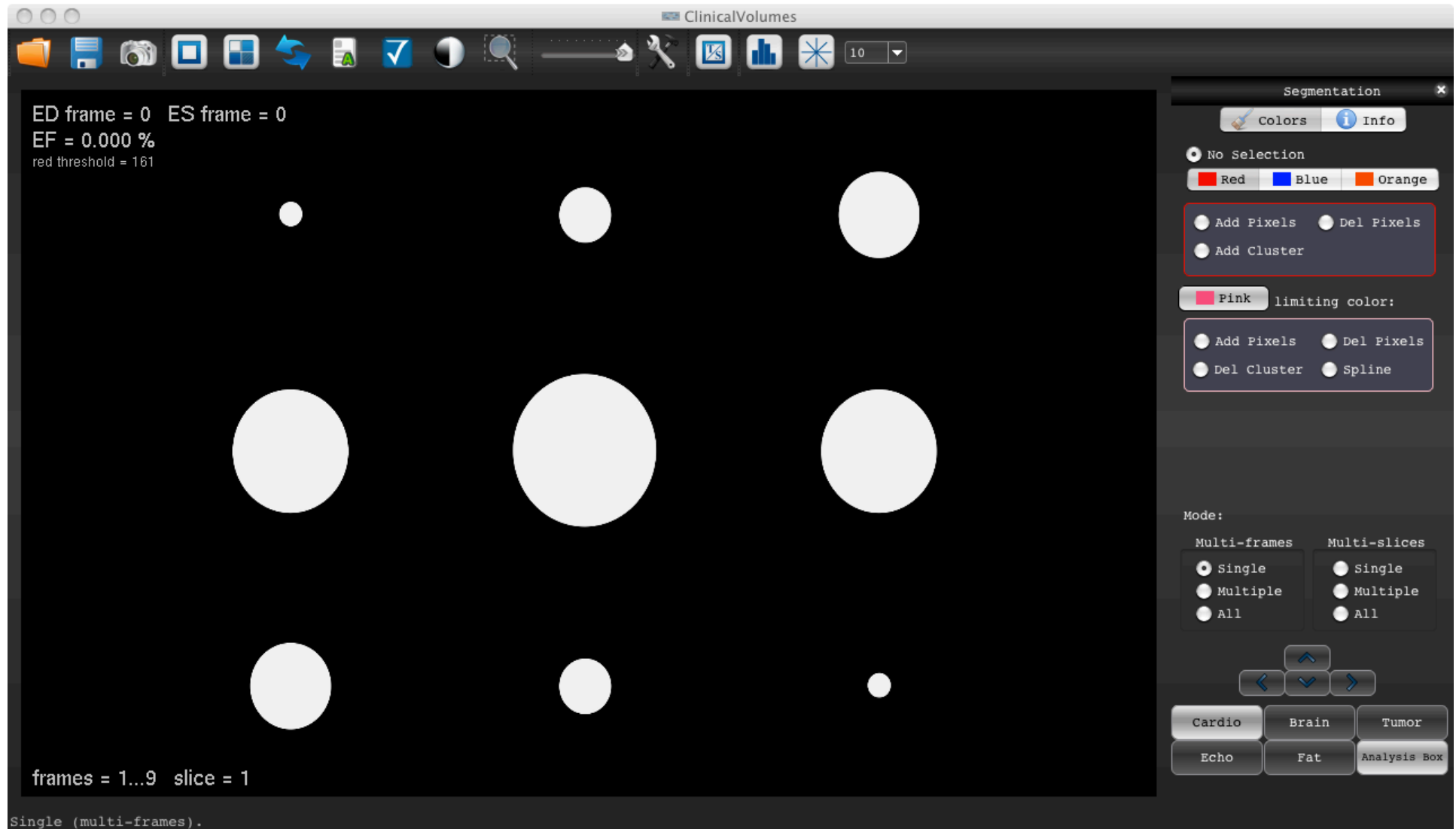


How to calculate volumes

Here a simple guide on how to calculate volumes

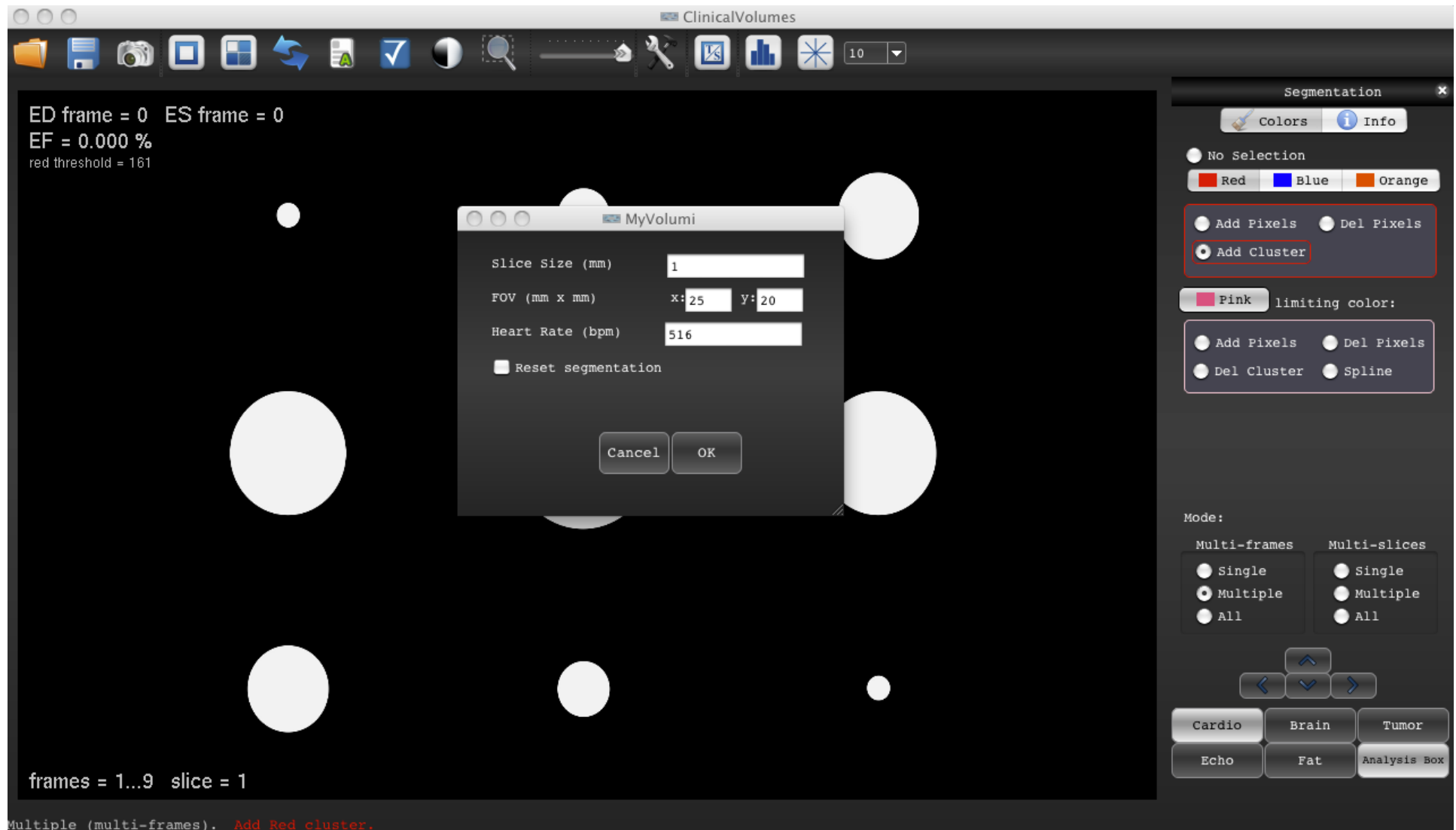
The volume of a sphere can be achieved as follows:

- 1) Open the dataset
- 2) Change panels (“Change to Multiple Panels “ command) to see all the images of the dataset

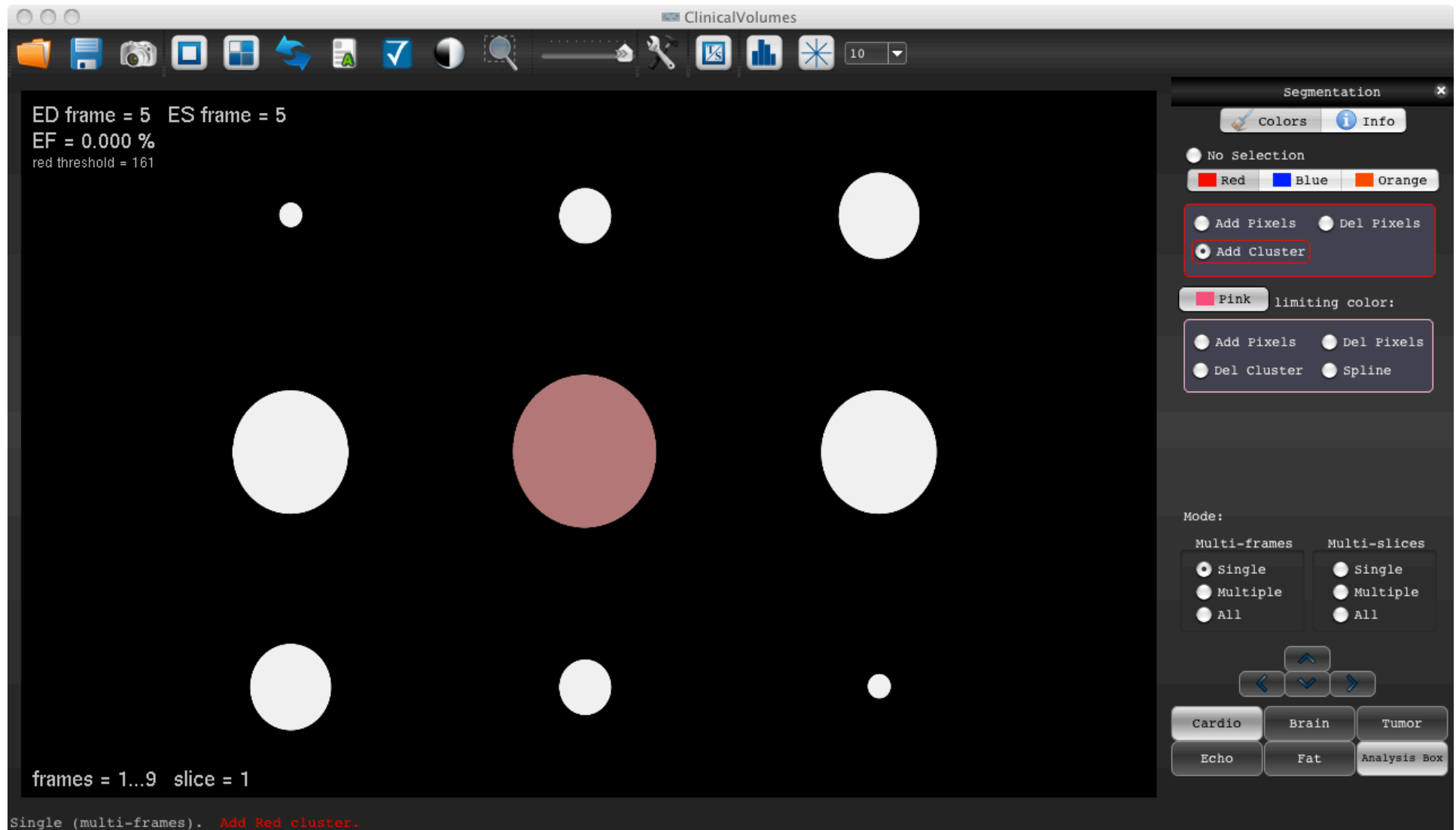


3) change the resolution of the images if necessary by the “Image settings” command if necessary

4) Note: in order to have a correct area and volume, the information provided in this window have to be accurate



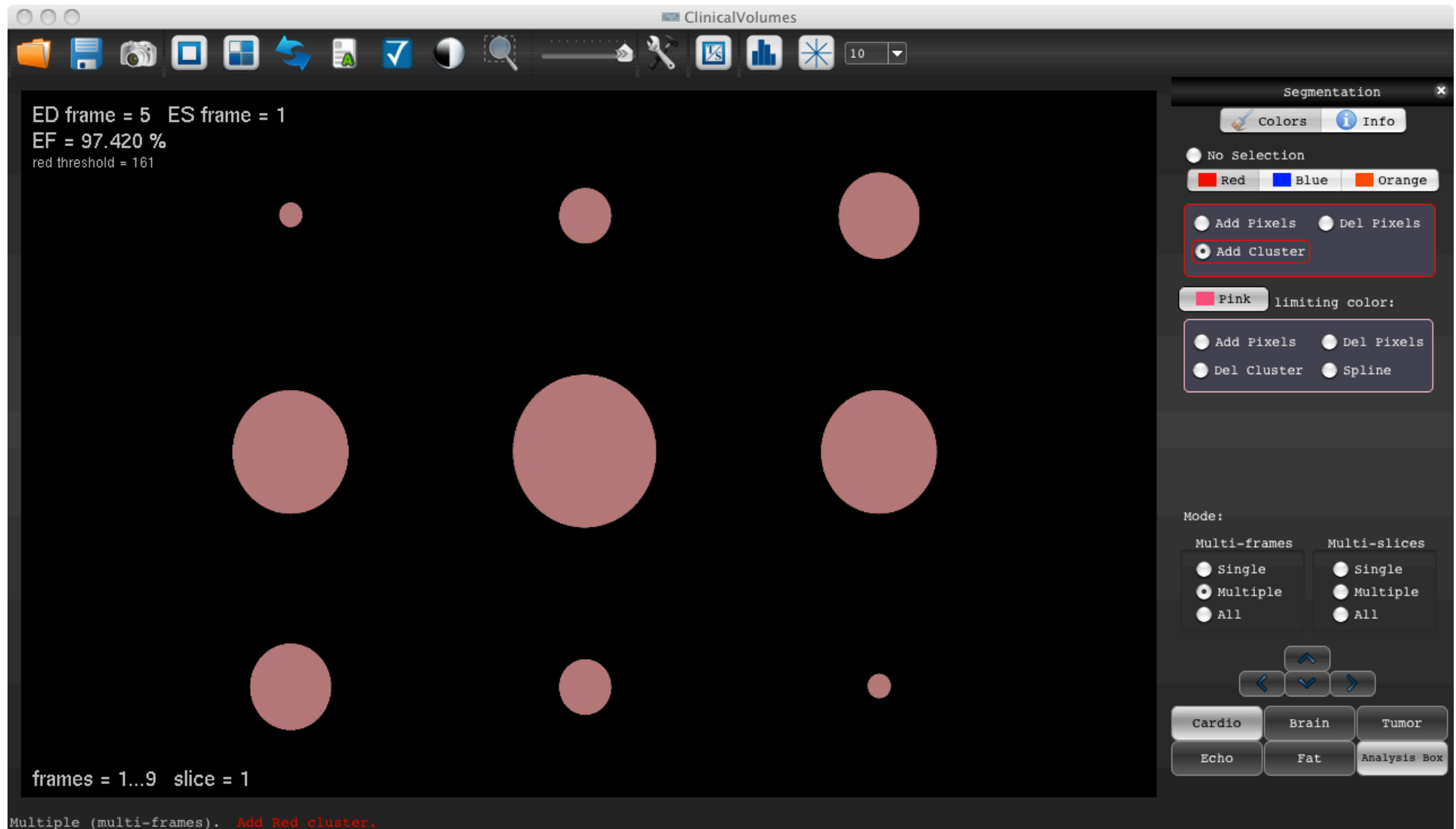
- 4) Apply a cluster, in this case a “*Red*” cluster, being in “*Single*” mode
- 5) An “*Orange*” or “*Blue*” cluster can also be applied instead



6) Move to “*Multiple*” (multi-frames) mode

7) Left click on one of the circles to copy the cluster to all the frames. Remember that the cluster will expand from the point of selection, therefore if it is outside the area that needs to be segmented, the cluster will not be applied

8) Save the data with the “Save results” command



When opening the saved text file

Refer to "A guide to image segmentation → 3) How to Save Results"

9) This section identify the total volume respective to each frame of the dataset in mm3. In this particular dataset we have 9 frames 1 slice

10) This section identify the total areas respective to each frame of the dataset in mm2.

Remember that such areas are not color related. The sum of all the colors is included for each frame.

11) Red volume of each frame of the dataset in mm3. These volumes are color-specific

```
sphere.txt
EF = 97.420 %

SV (microL) = 120.617

CO (mL/min) = 62.239

Vmax (microL) = 123.812, end-diastolic frame = 5
Vmin (microL) = 3.194, end-systolic frame = 1

Pixels X * Y = 720 * 540

Volume tot (frame)
3.194
16.323
39.599
80.910
123.812
80.910
39.599
16.323
3.194

Areas tot
frame no 1
3.194
frame no 2
16.323
frame no 3
39.599
frame no 4
80.910
frame no 5
123.812
frame no 6
80.910
frame no 7
39.599
frame no 8
16.323
frame no 9
3.194

Red Volume (frame)
3.194
16.323
39.599
80.910
123.812
80.910
39.599
16.323
```

12) The volumes are always reported in mm3 and calculated as:

$$\text{volume} = \text{cluster area} * \text{slice thickness}$$

13) Areas are always reported in mm2 and automatically resolved. ClinicalVolume calculates the area of a cluster as follows:

$$\text{Image resolution} = \text{FOV} / \text{matrix size} \quad (\text{in the X and Y direction})$$

$$\text{Cluster area} = \text{Image resolution} * \text{number of pixels filled by a color}$$

Note: if the information provided as slice thickness and FOV are incorrect, volumes and cluster areas will also result incorrect.