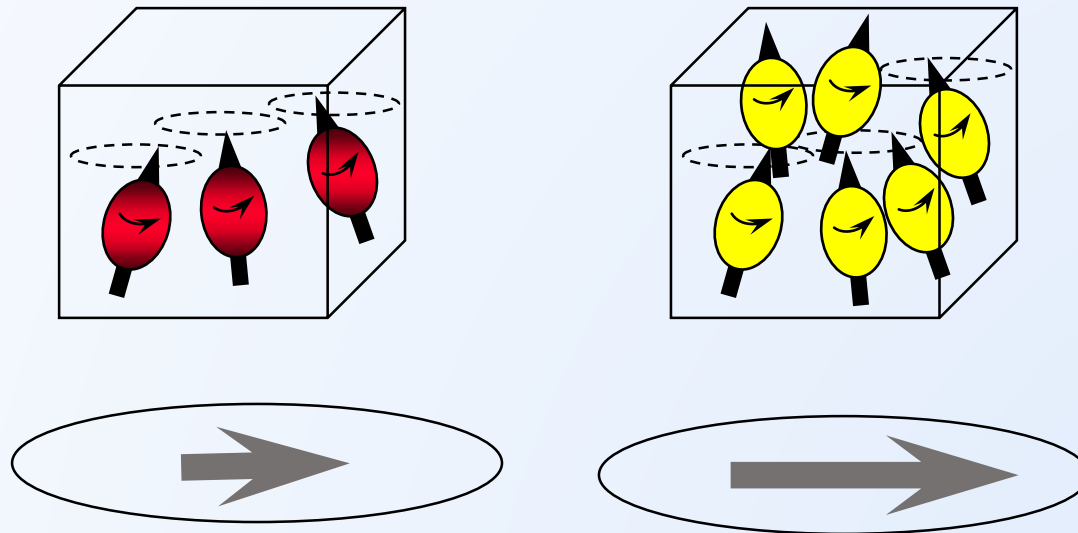


Lesson 7 (B): Proton density contrast Image weight

Aims

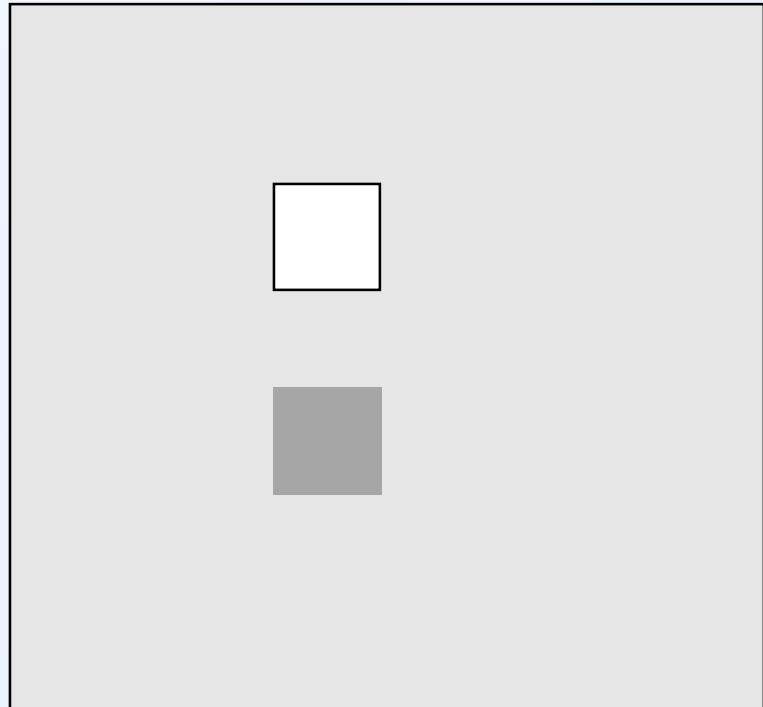
- Learning the following topics:
- Proton density (PD) contrast
- Image weight
- Effect of imaging parameters on image weight

Proton density

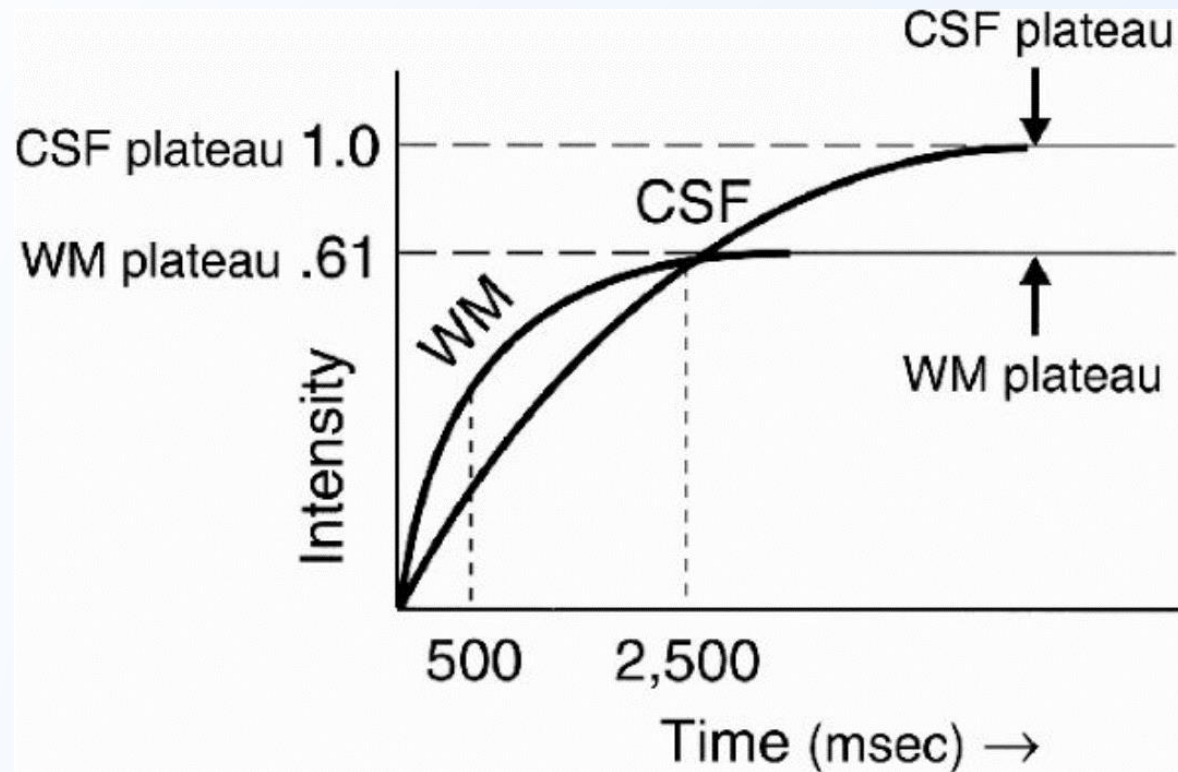


Resulting Signals

Proton density contrast



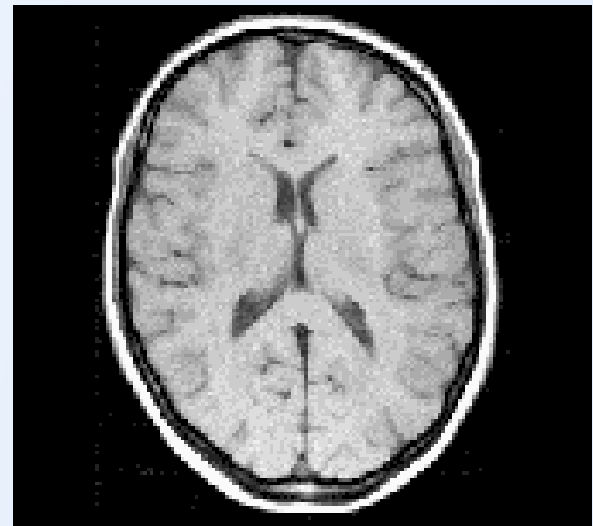
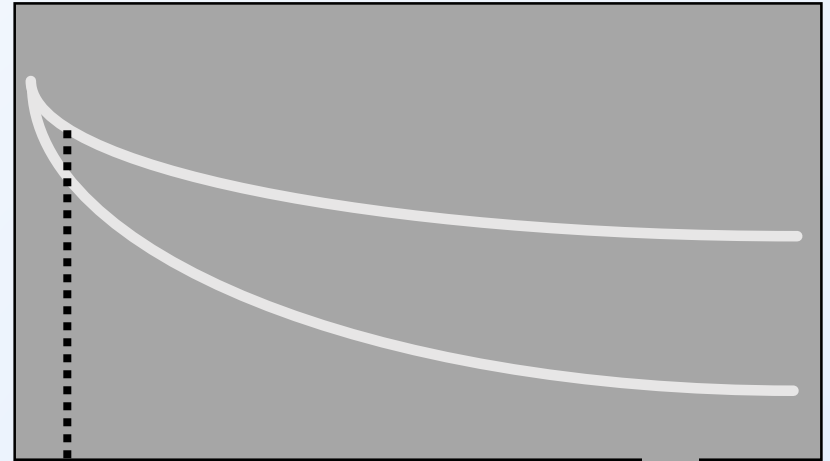
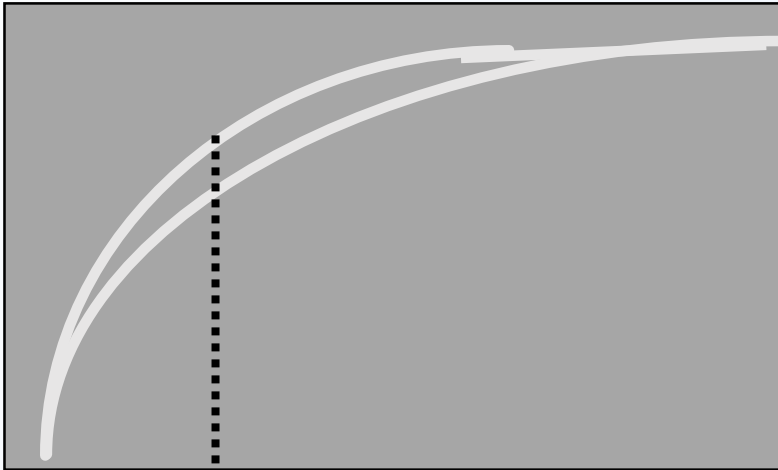
Proton density contrast



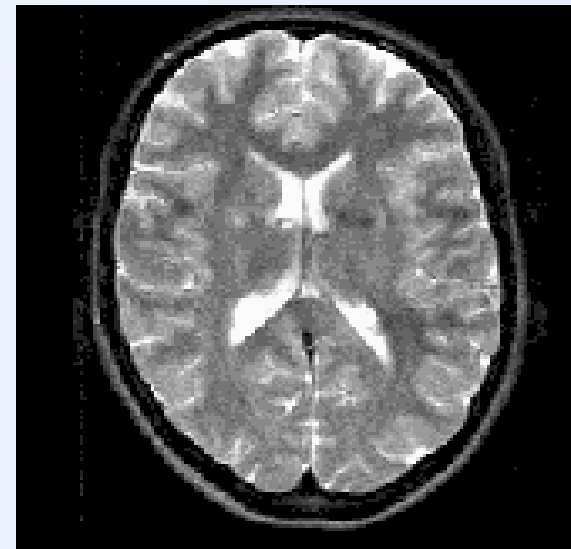
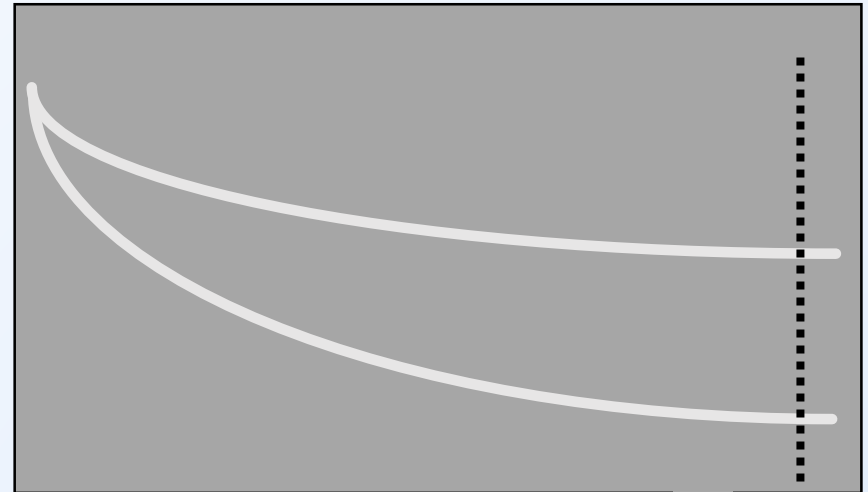
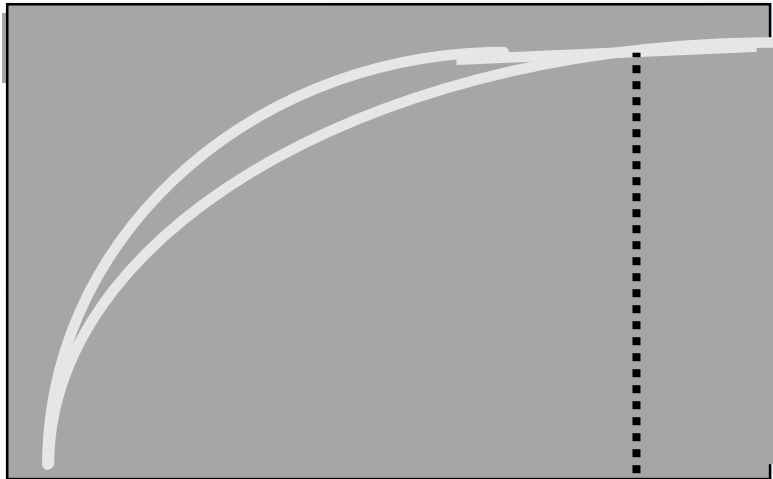
TR, TE and image weight

- T1 weighting
- T2 weighting
- PD weighting

T1 weighting



T2 weighting



PD weighting

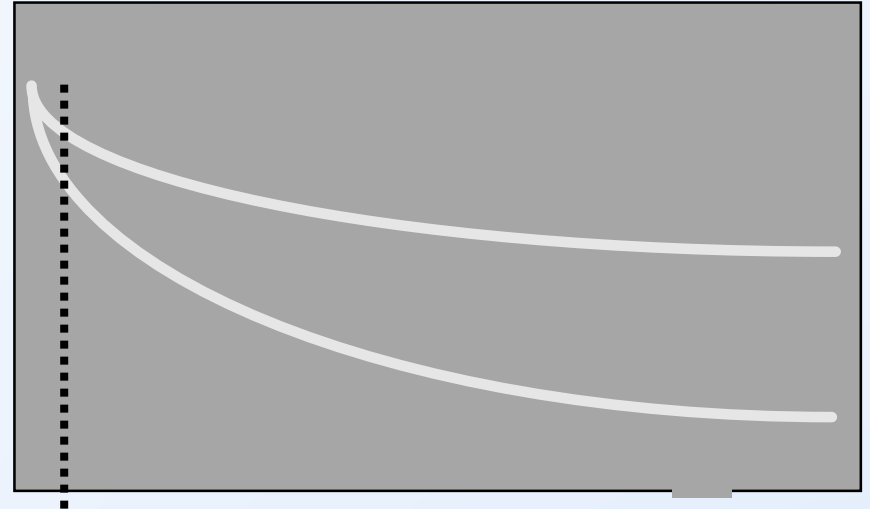
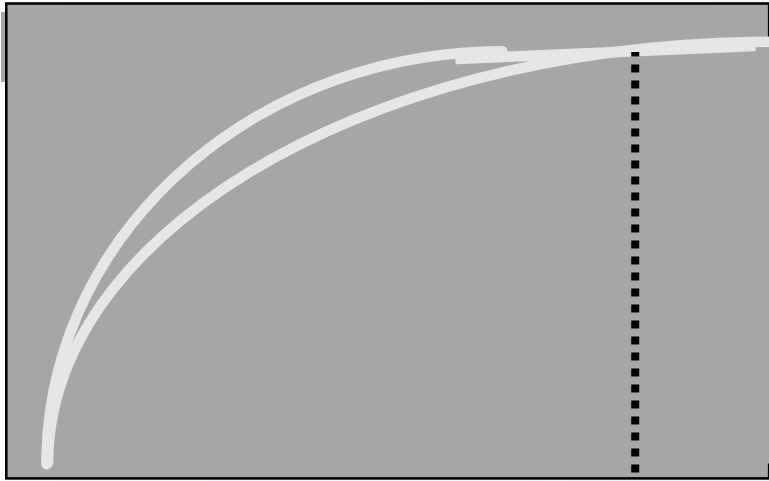
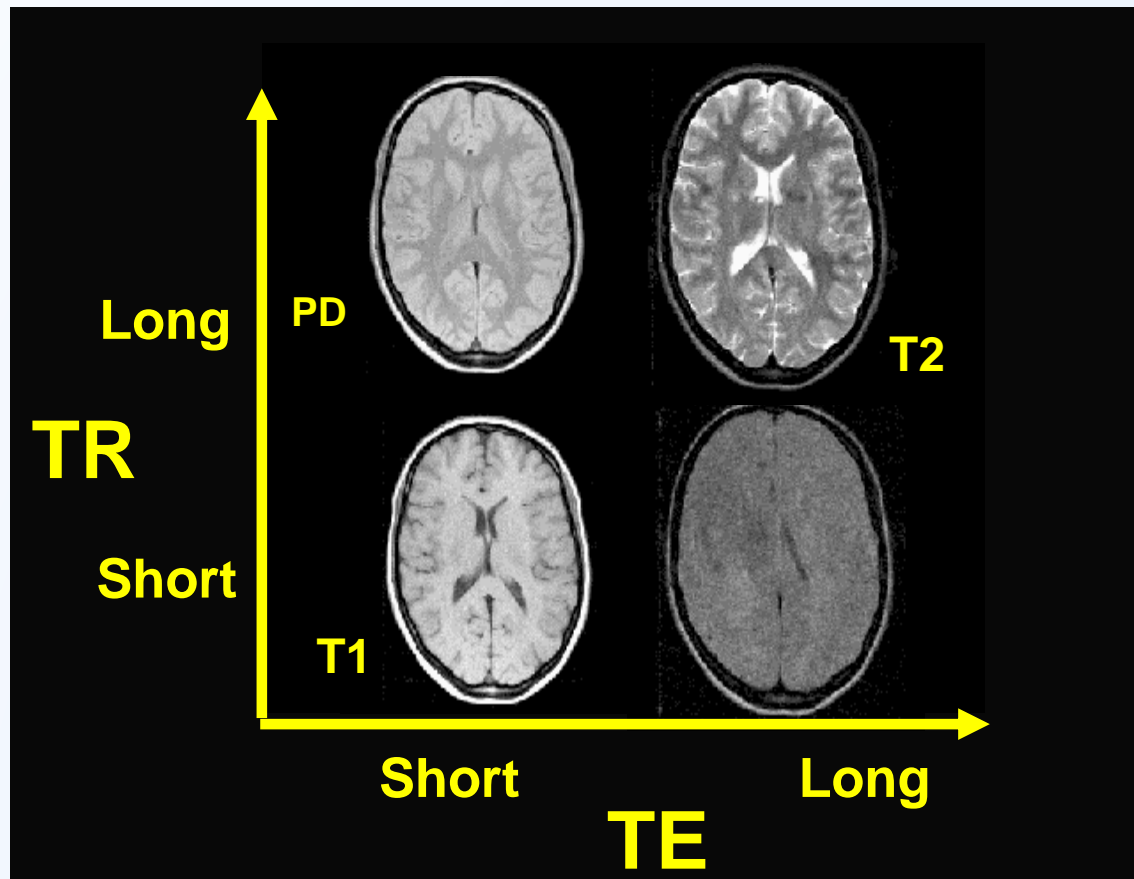


Image contrast



Brain images with different weightings



PD weighted image

T1 weighted image

T2 weighted image

Image parameters and image weights

- | Image weight | TE | TR |
|--------------|---------------------|----------------------|
| T2 | Long ($\sim T_2$) | Long ($\gg T_1$) |
| T1 | Short ($\ll T_2$) | Short ($\sim T_1$) |
| PD | Short ($\ll T_2$) | Long ($\gg T_1$) |

Summary

- Proton density contrast
- Image weight
- Effect of TR and TE on image weight

Reference

- Hashemi, RH and Brandy, WG. MRI the Basics, Second Edition