

## MRI CT Scanner

- In CT Scan (on X-ray) images are not clear because they're based on absorption (It is good for bones, sometimes tissue)
- MRI is based on protons
- Into the body they have arbitrary positions
- When we apply a strong magnetic field, protons are aligned with magnetic field, when radiofrequency pulse is applied, some of them gets activated. When pulse ends, activation ends & relaxation time  $T_1$  is measured.

Because protons belong to  $H_2O$  (hydrogen) it works better in tissues

## Ultrasound Devices



- Ultrasound is a sound we can't hear. (Audible  $\rightarrow 20-18000\text{ Hz}$ )  
It's greater than  $20\text{ kHz}$ . In medical imaging it's  $1-15\text{ MHz}$ .
    - Lower Frequency  $\downarrow$  Better penetration  $\nearrow$  Less resolution ( $3\text{ MHz}$ )
    - Higher Frequency  $\uparrow$  Worst penetration  $\downarrow$  Higher resolution ( $12\text{ MHz}$ )  
(we don't miss tissues)
  - Development of fetus
  - Evaluation of blood flow
  - Detection of tumors
- can be seen  
(using doppler effect)