

Yanlu Wang

Enh. MR Fysik,
Medicinsk
Strålningsfysik och
Nuklear Medicin

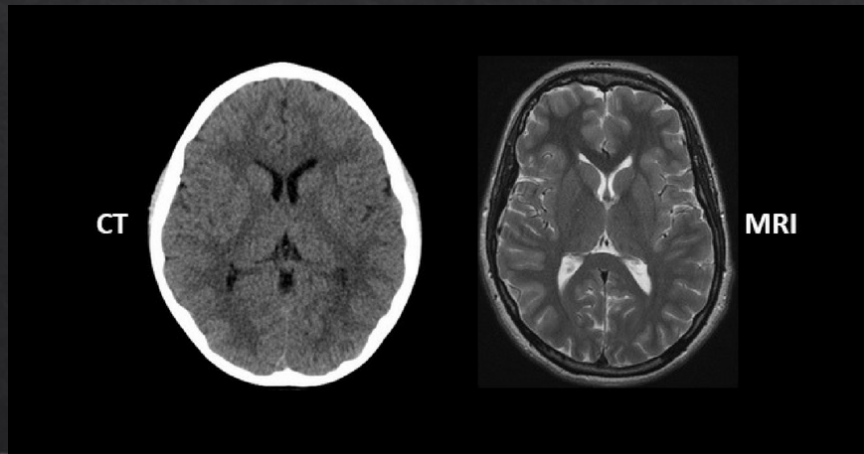
Karolinska
Universitetssjukhuset,
Solna

Tillämpningar MRT

Magnet Resonans Tomografi (MRT)

Fördelar

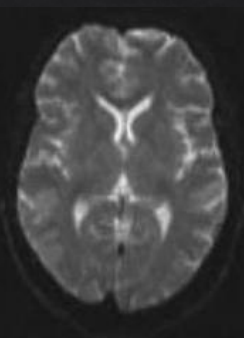
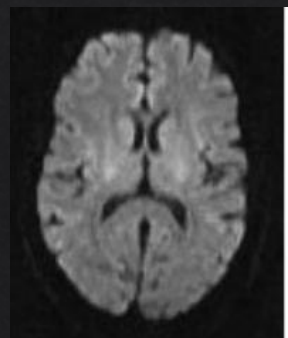
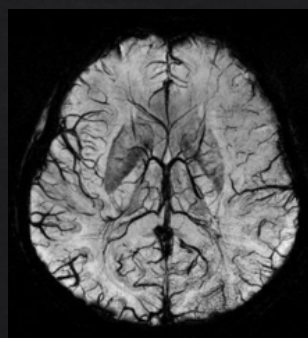
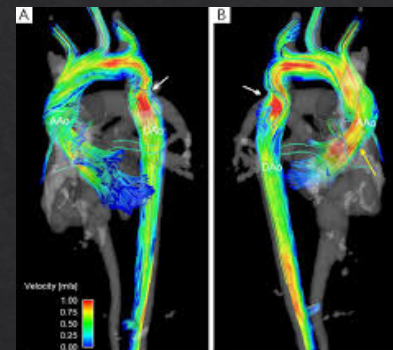
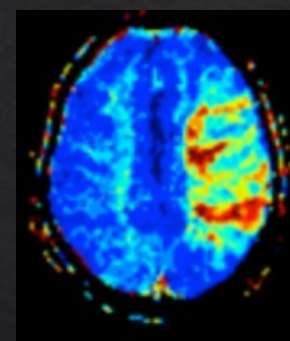
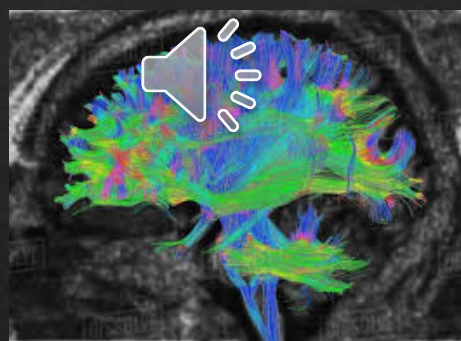
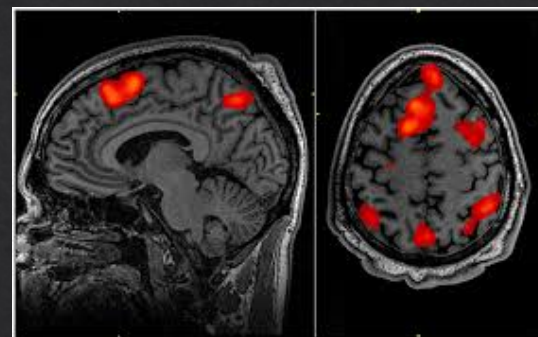
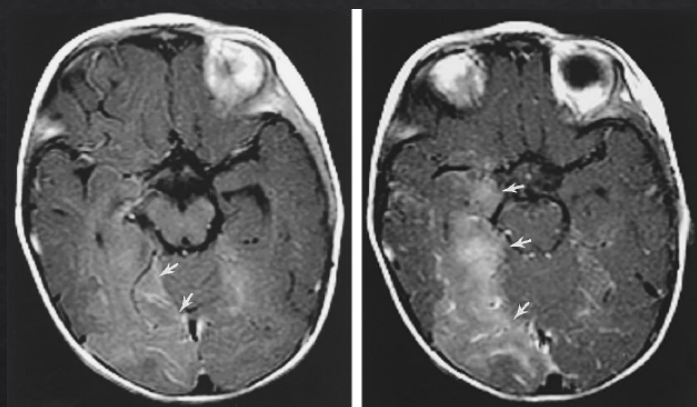
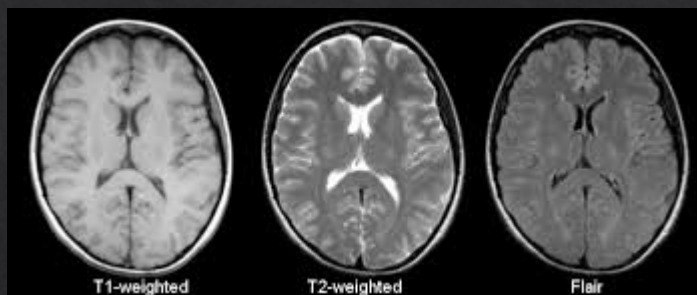
- ◇ Inga joniserande strålning
- ◇ Överlägsen mjukvävnadskontrast
- ◇ Många olika typer av kontrast kan avbildas



Nackdelar

- ◇ Långsam
- ◇ Dyr
- ◇ Säkerhet och logistik
 - ◇ Inga (ferro)magnetiska föremål kan skannas
 - ◇ Implantat och pacemakers
- ◇ Relativa Intensitet/Kontrast
 - ◇ Svår att få absoluta värden med MR

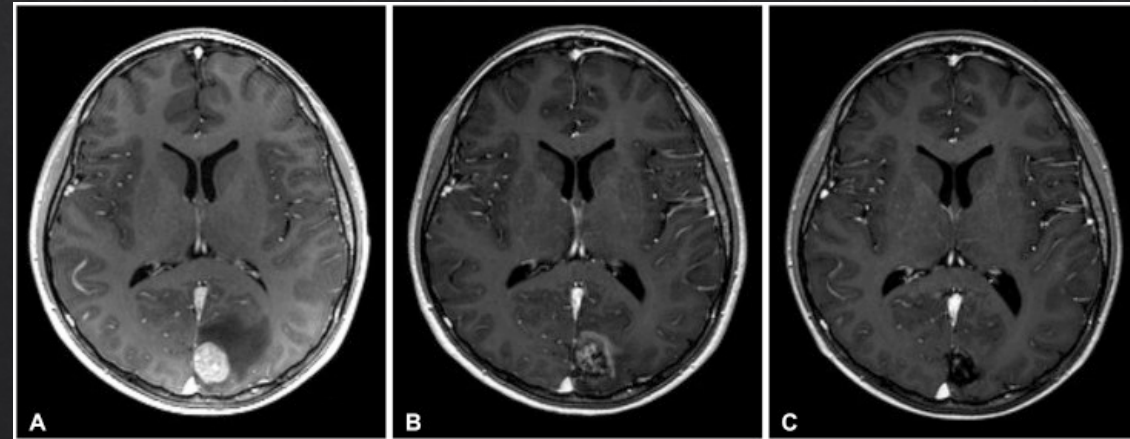
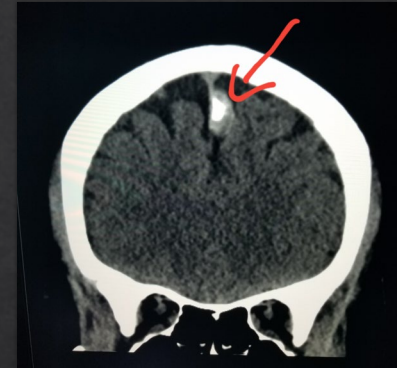
MR Neuro



Tumör (1)

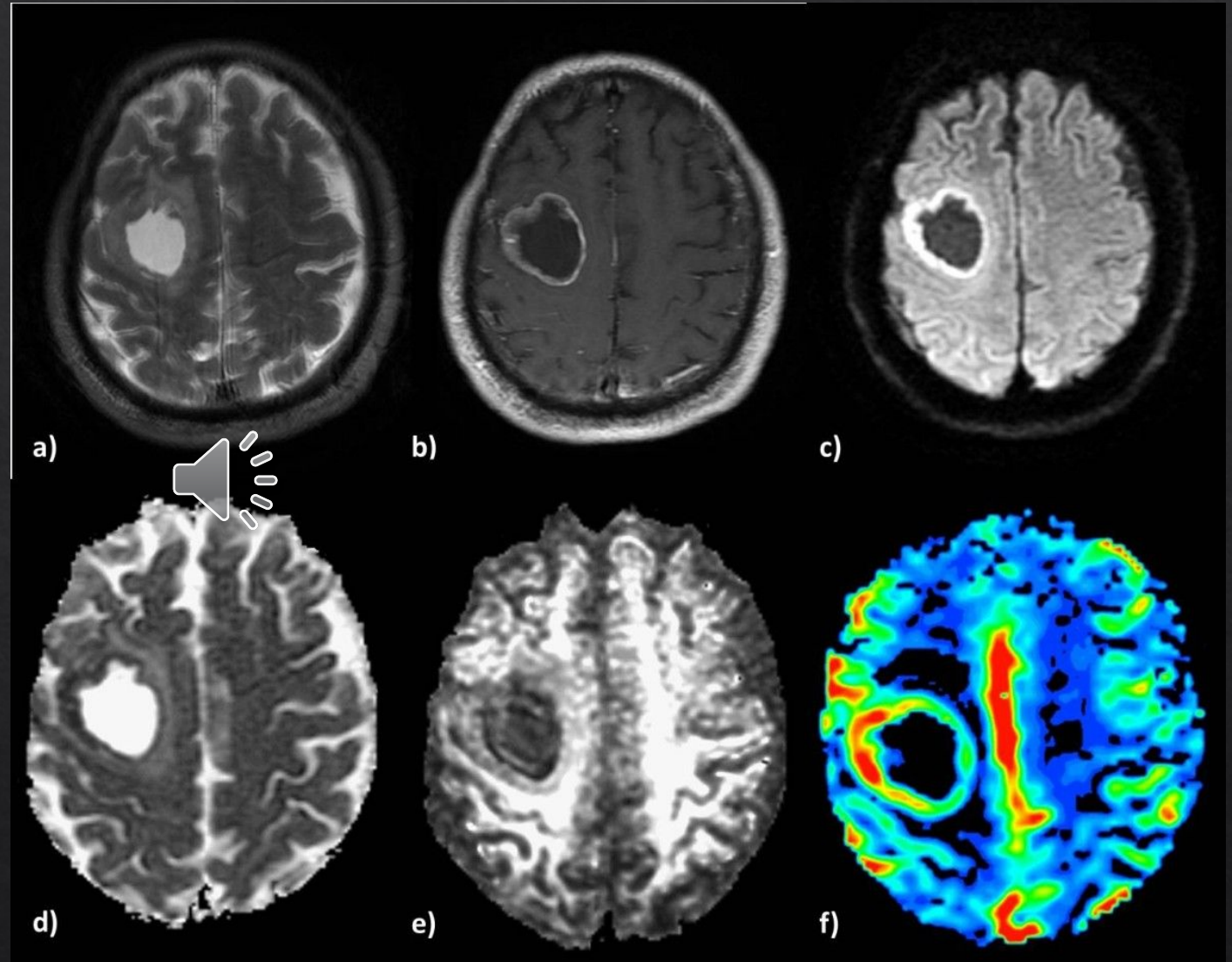
Bättre och många olika typer av mjukvävnadskontrast:

- Bättre särskilning av normal- och tumörvävnad.
- Kan enkelare skilja mellan nekrotisk vävnad, tumörvävnad, edem, blödning, etc...



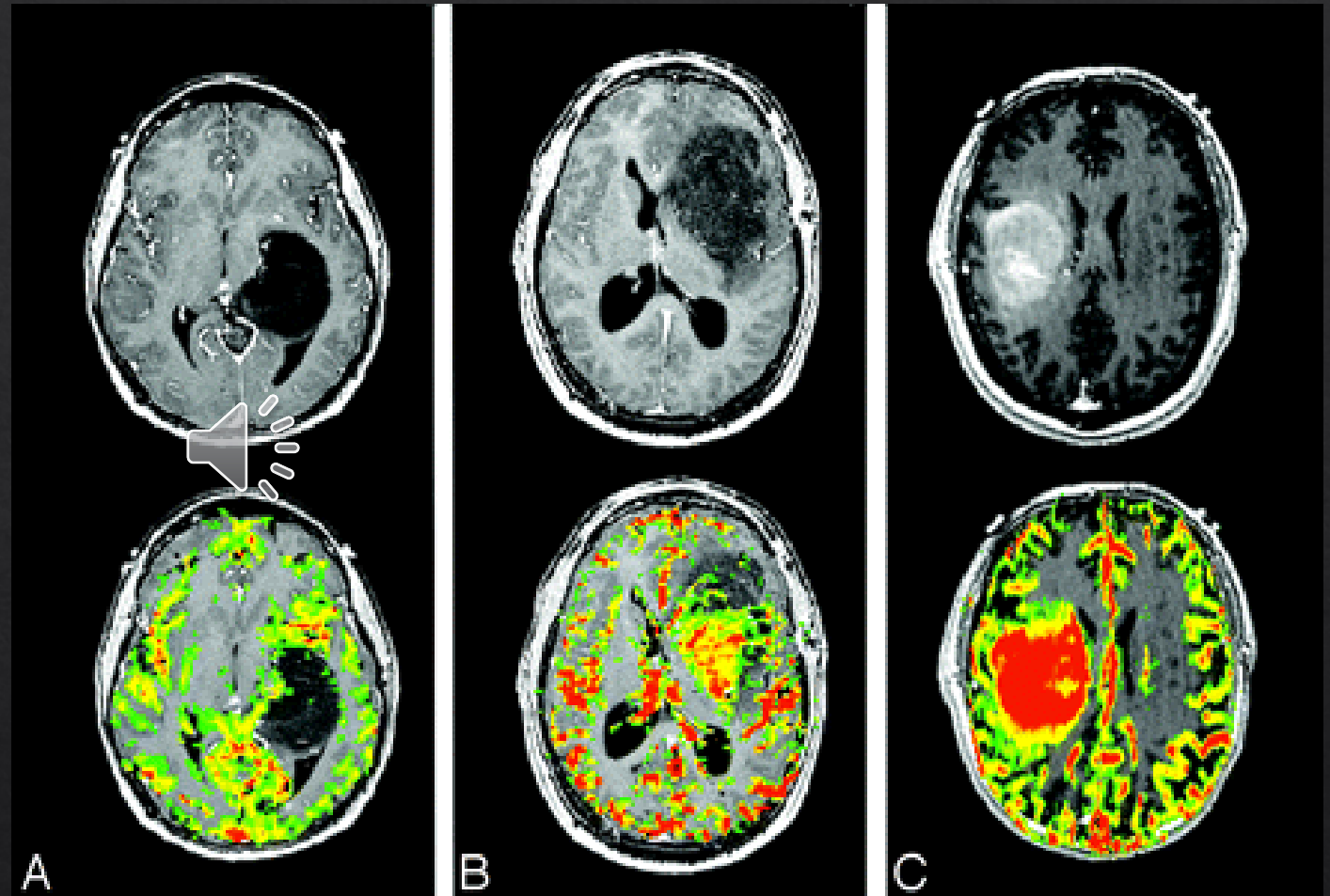
Tumör (2)

- ◇ ”Exotiska” kontraster som diffusionsviktning och perfusionsviktning kan också användas för att gradera tumörer.



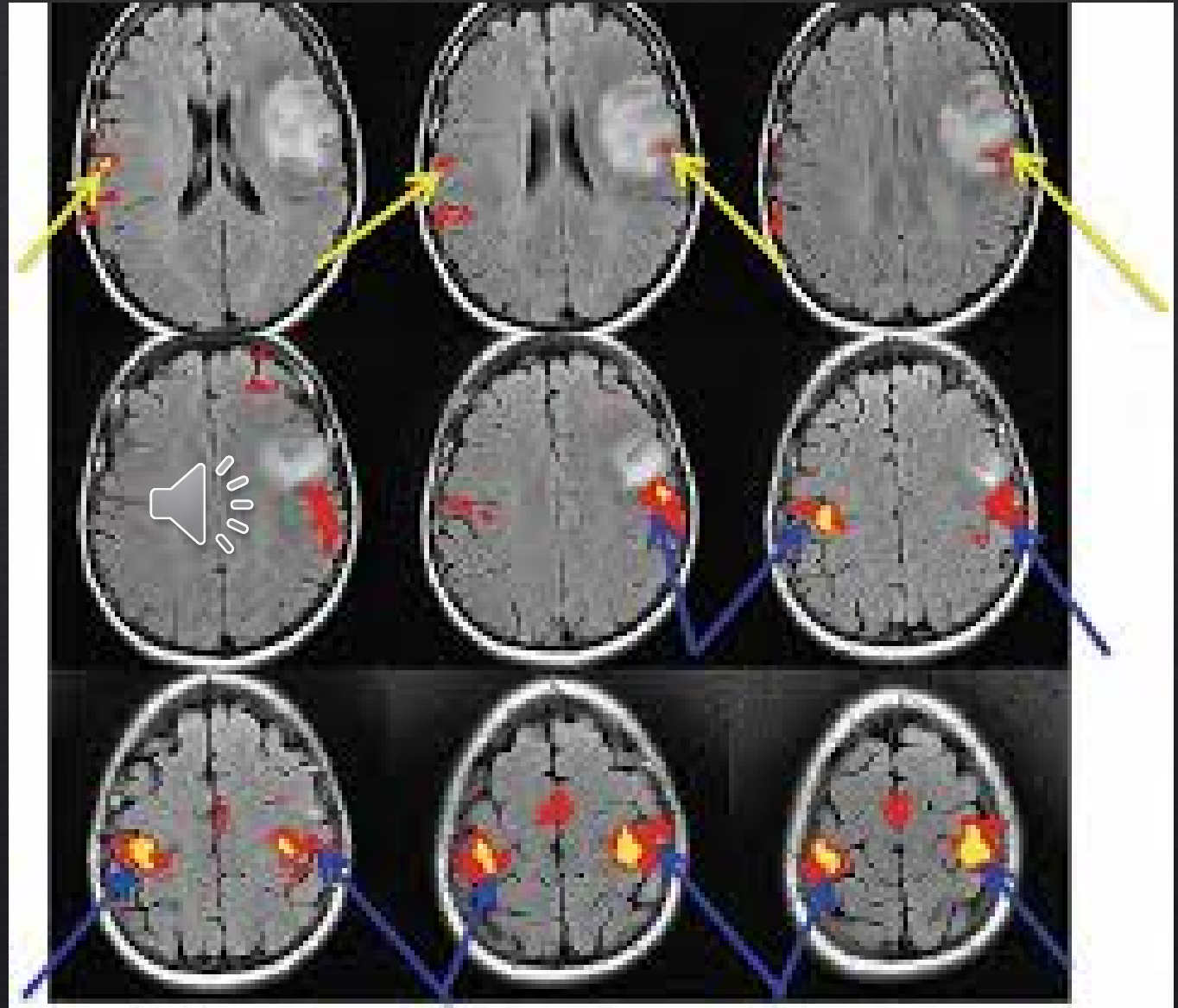
Tumör (3)

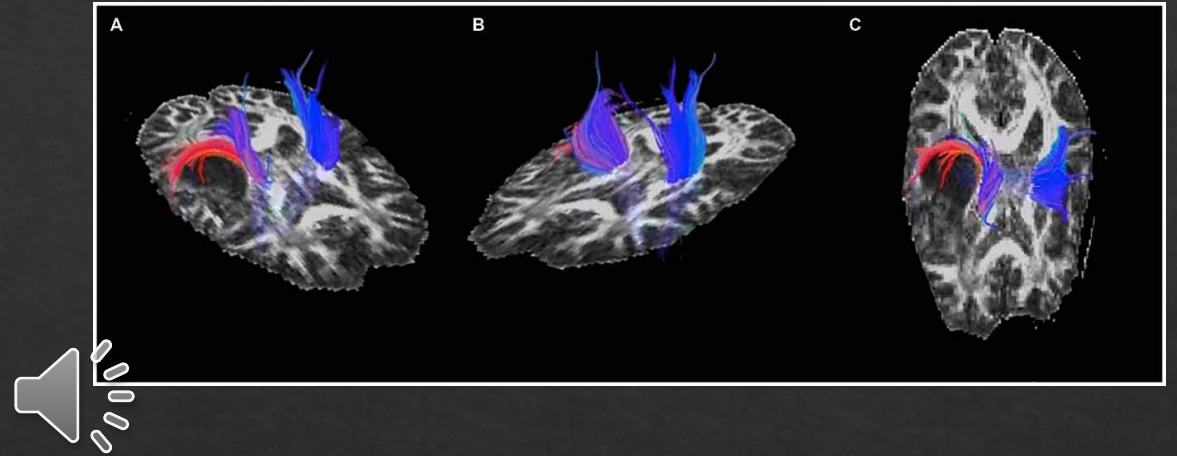
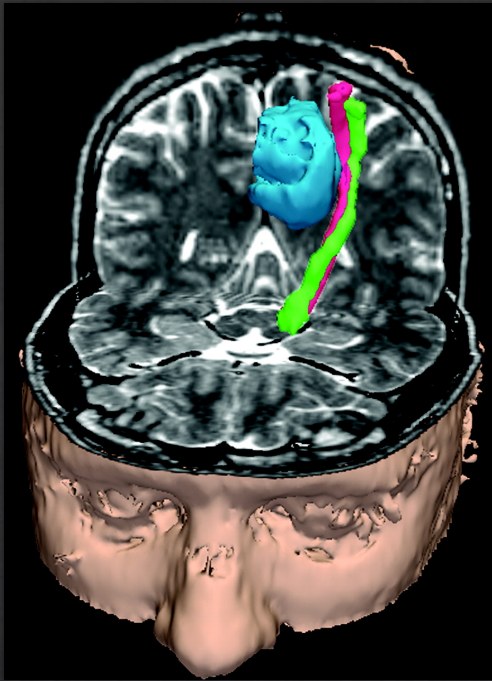
Staging



Tumör (4)

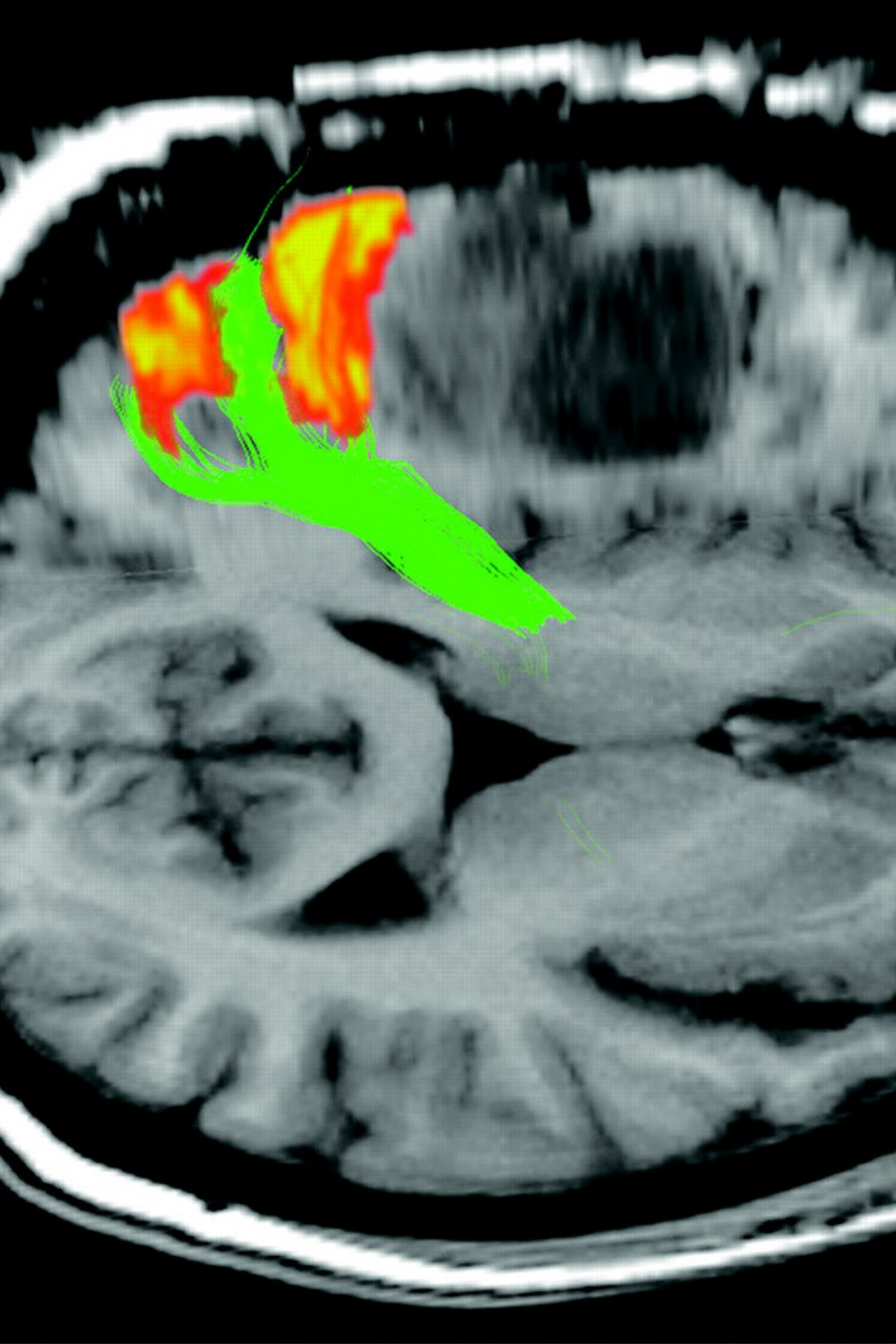
- ◇ Prekirurgisk planering (1)
 - ◇ Undvik funktionella delar med fMRI





Tumör (5)

Undvik skada till “informationstransporten” med DTI

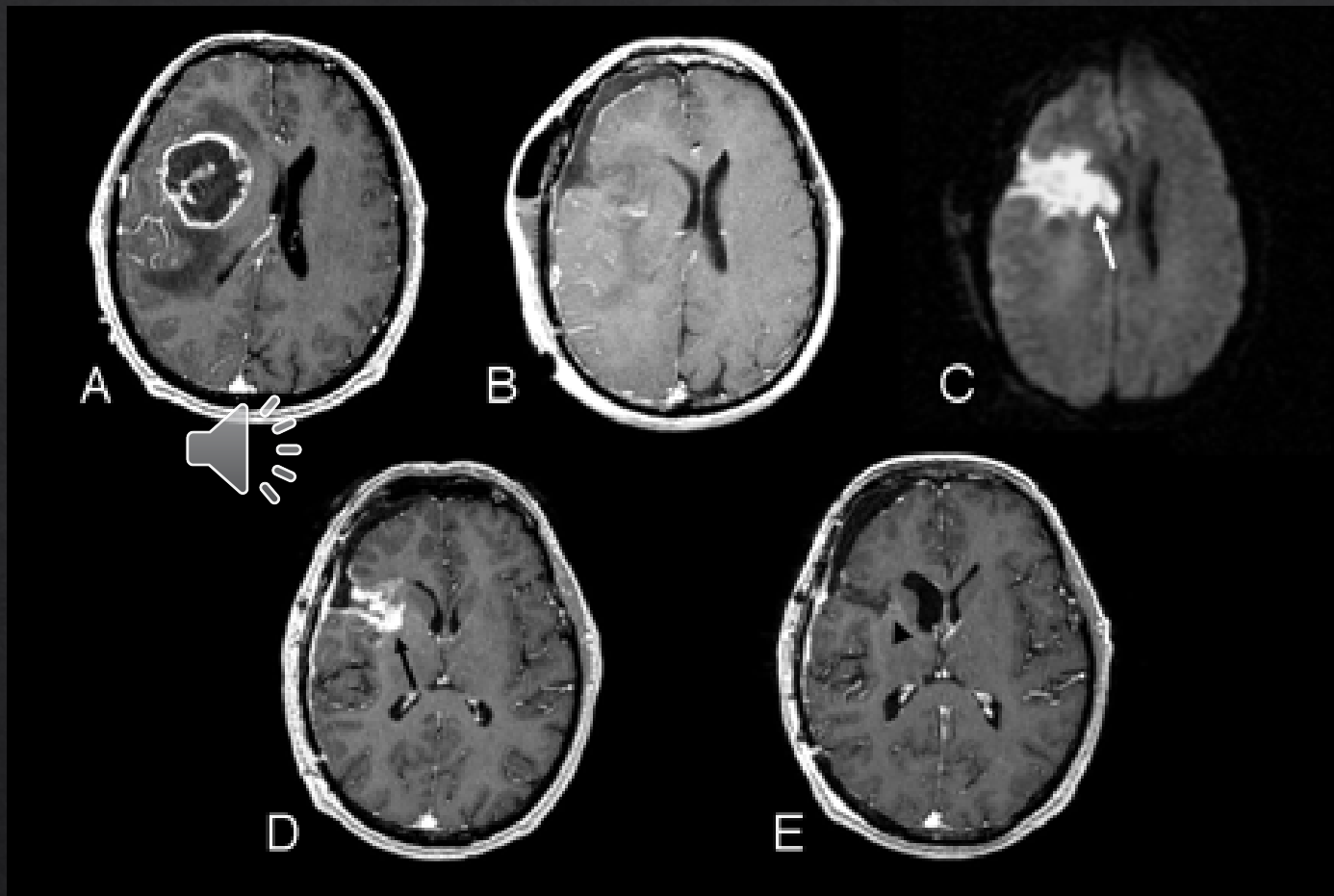


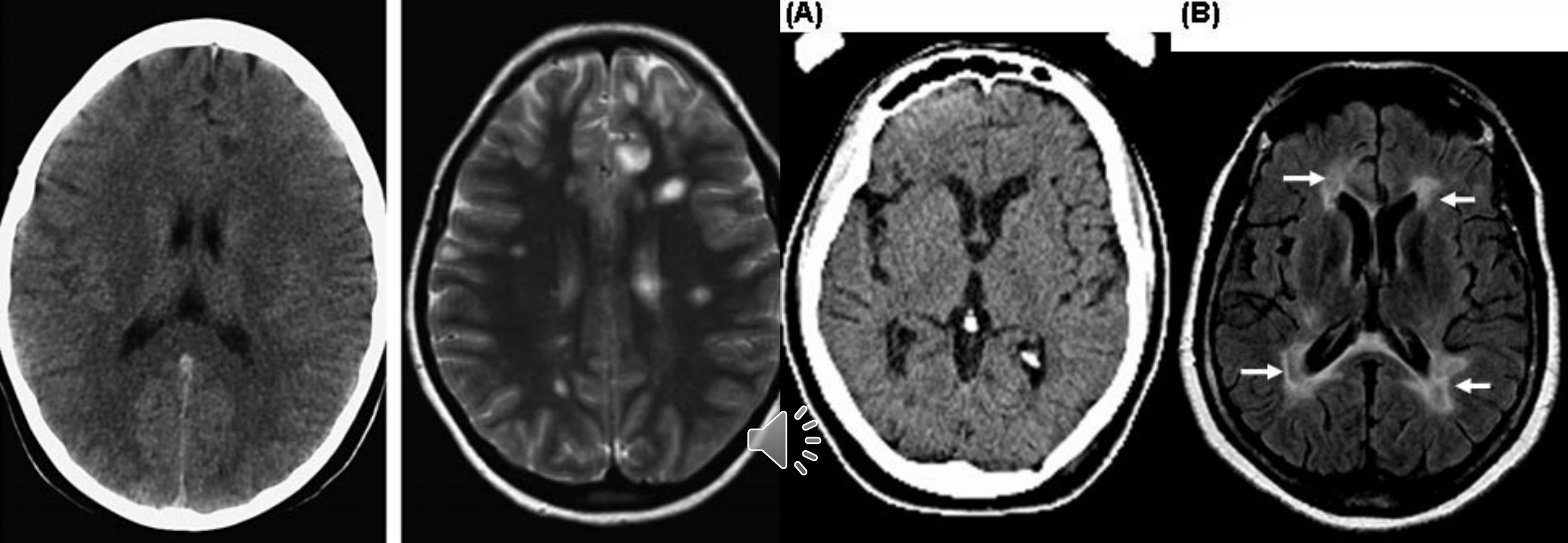
Tumör (6)

Kombinera fMRI och DTI

Tumor (5)

◇ Uppföljning

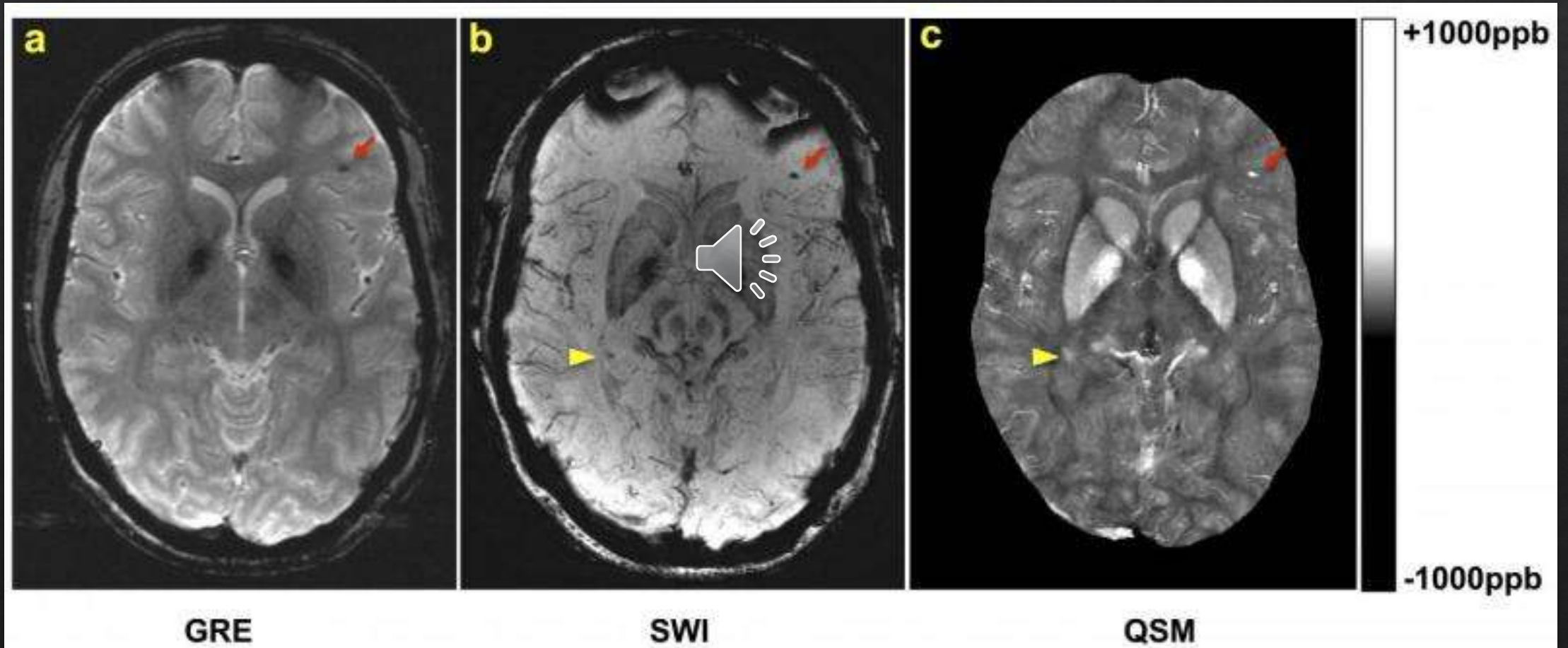




Neurologiska sjukdomar (1)

Multipel skleros

Neurologiska sjukdomar (2)



Trauma

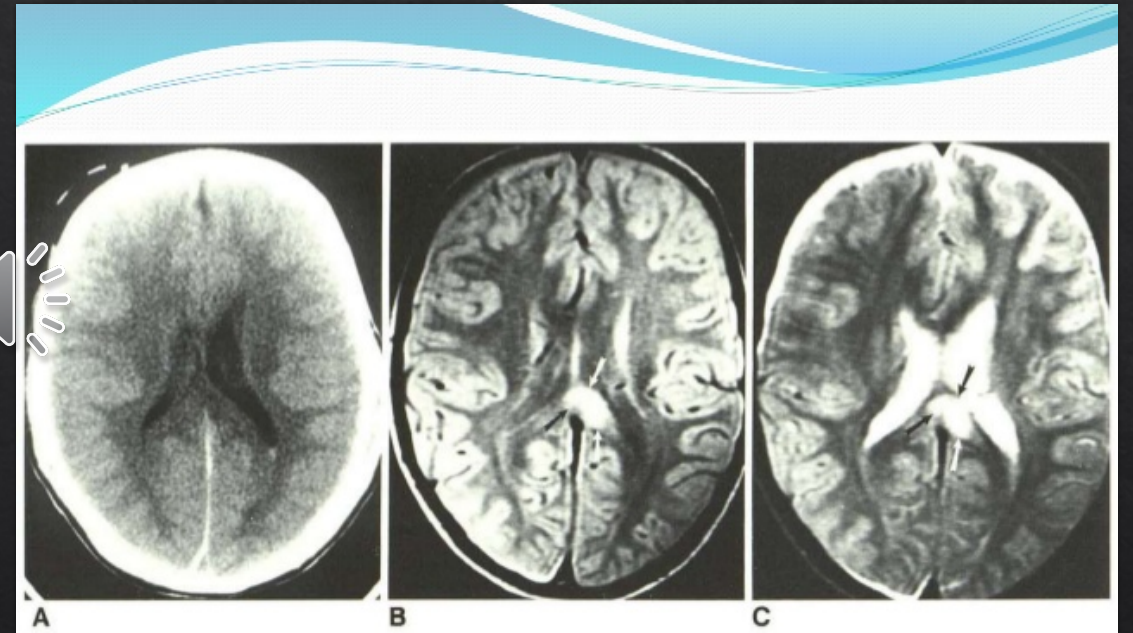
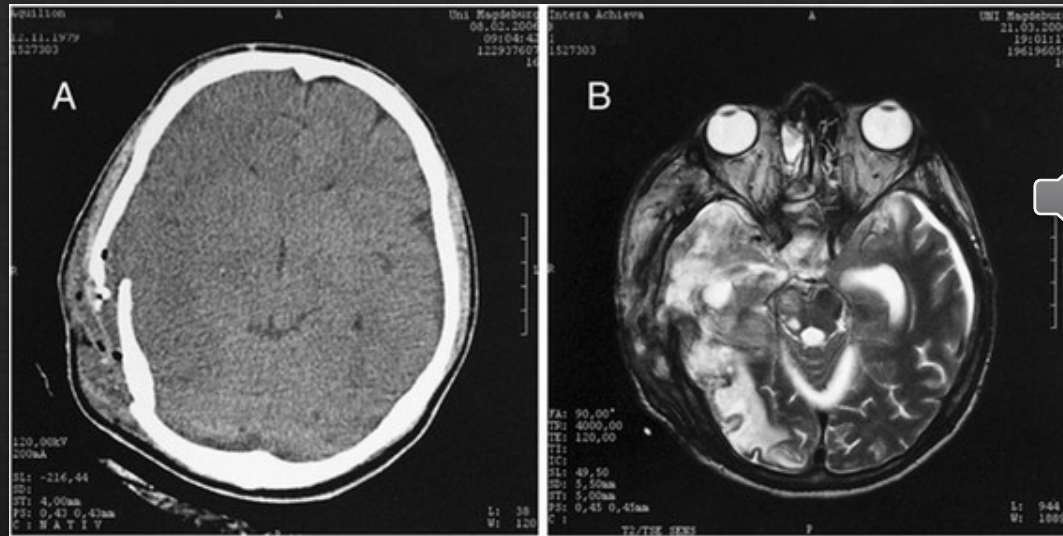
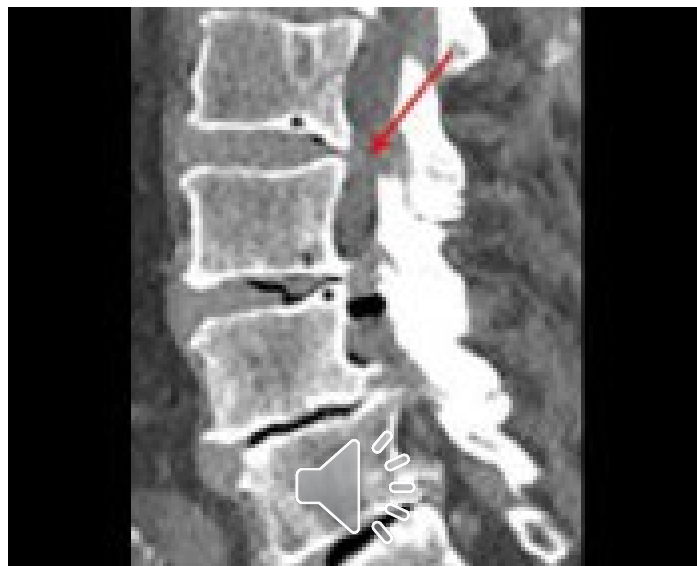
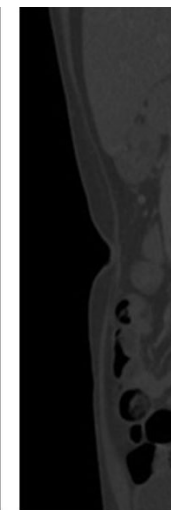


Fig. 2.—Case 8: shear injury of corpus callosum.
A, CT scan shows some blood along posterior falx. Asymmetry of lateral ventricles is from slight head tilt.
B and C, Proton-density-weighted (B, SE 20/3000) and T2-weighted (C, SE 70/3000) images reveal large contusion in splenium of corpus callosum (arrows). Thin subdural hematoma is present in right occipital region, and subdural effusions are noted over both frontal lobes.



MRI Scan Image



CT S

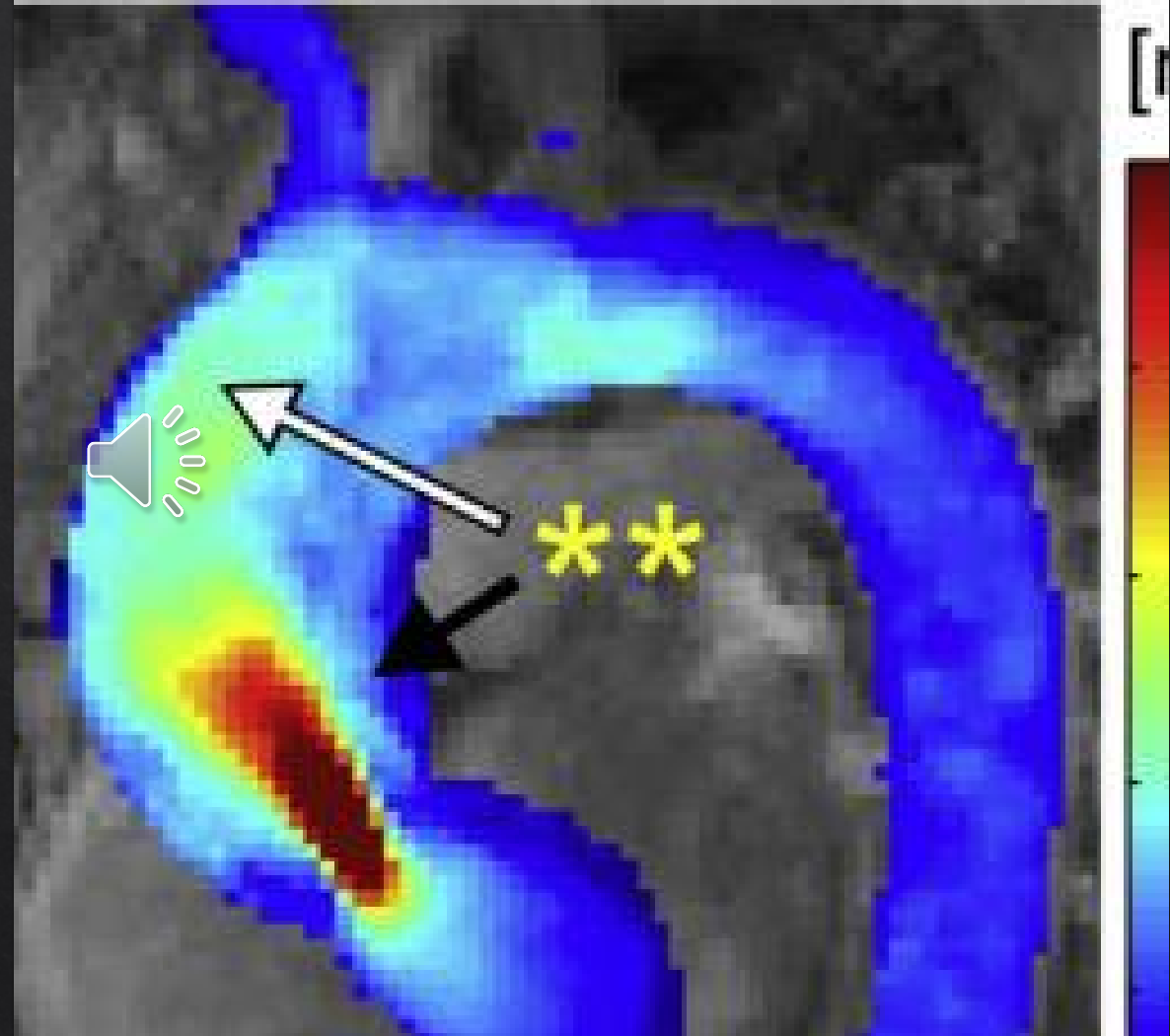
Diskbråck

Olika MR kontraster kan leda till bättre identifiering av diskbråck

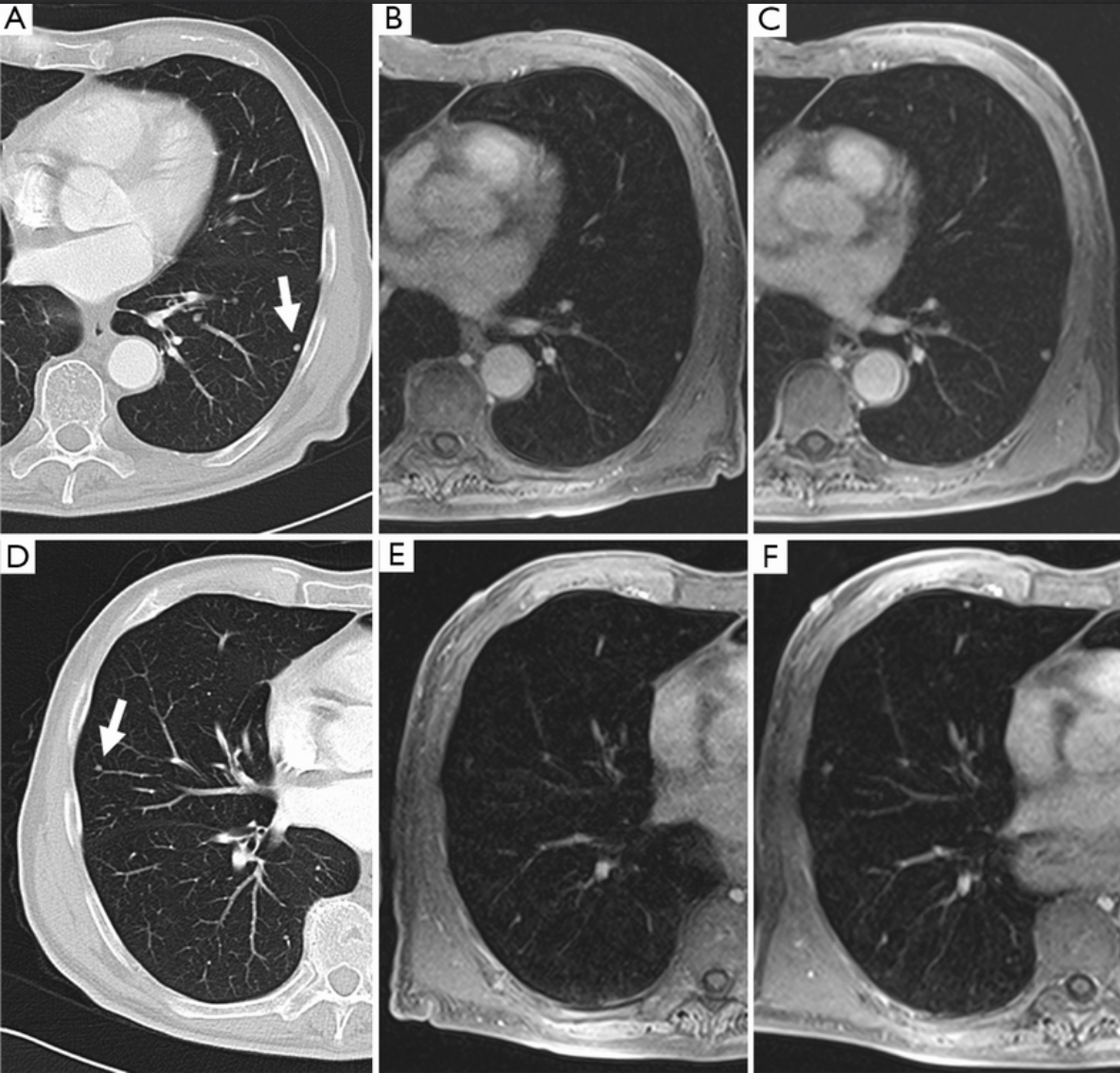
Fysiologi

- ◇ MR används flitigt inom fysiologi för att visualisera både anatomiska och funktionella defekter för hjärtat.
- ◇ 4D (3D+tid) sekvenser kan användas som stödteknik för andra tekniker

MIP: absolute velocity



Thorax

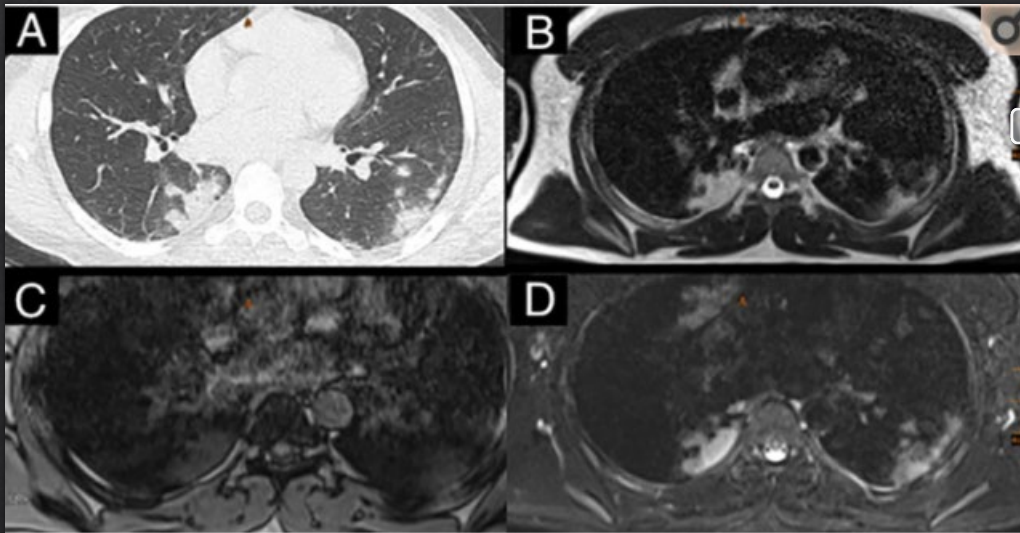


- ◇ Oncologi
- ◇ Svår för MR – mycket luft, men nya UTE/ZTE sekvenser ger hopp för drastiska förbättringar inom området.



”Nyheter” – COVID19

MR Lunga

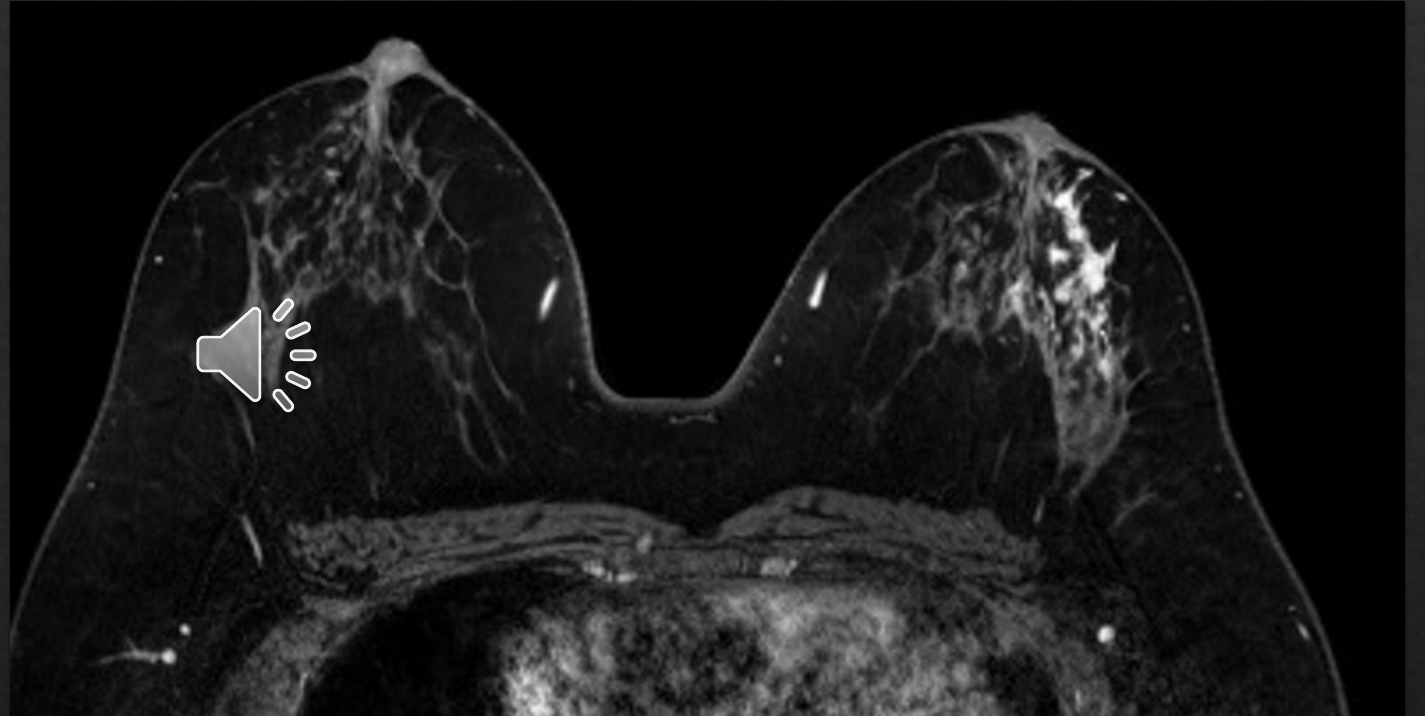


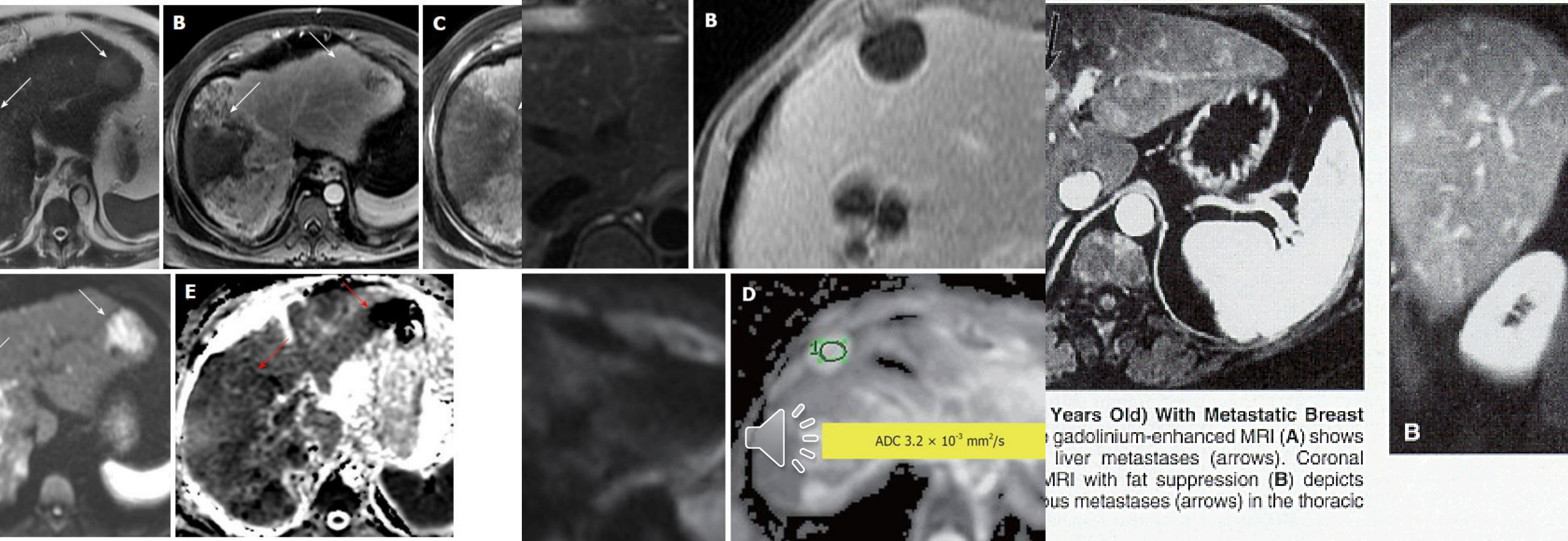
COVID-19

- ◇ Vissa COVID-19 patienter med svåra symptom visar kvarstående GGO (kristallisering av lungvävnad)
- ◇ Graden av kristallisering är direkt korrelerade med grad av symptom under, och återhämtningsförmågan.
- ◇ CT föredras pga. av enkelheten samt kostnad.

Bröst MR

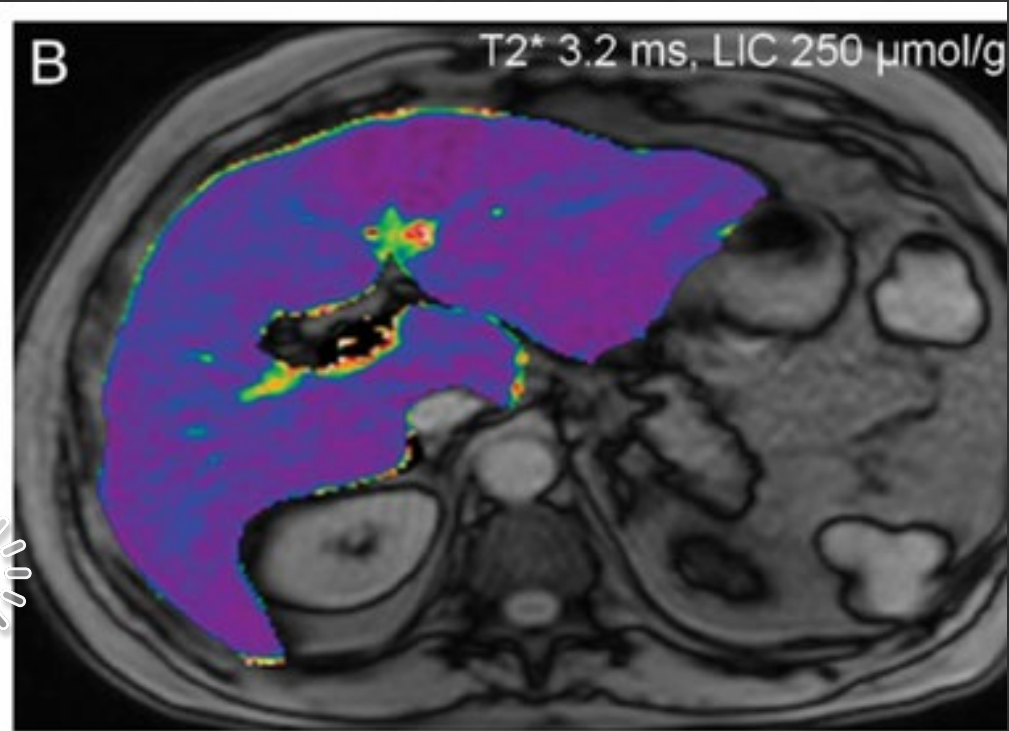
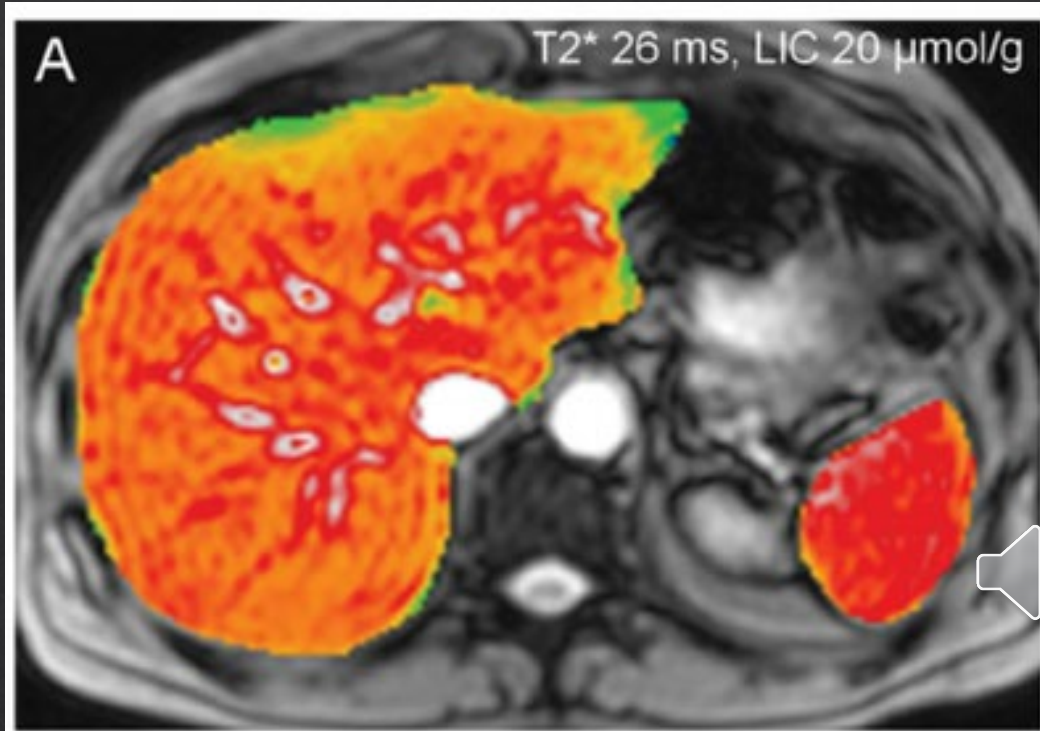
- ◇ Implantat ruptur
- ◇ Onk/Pat
- ◇ Screening



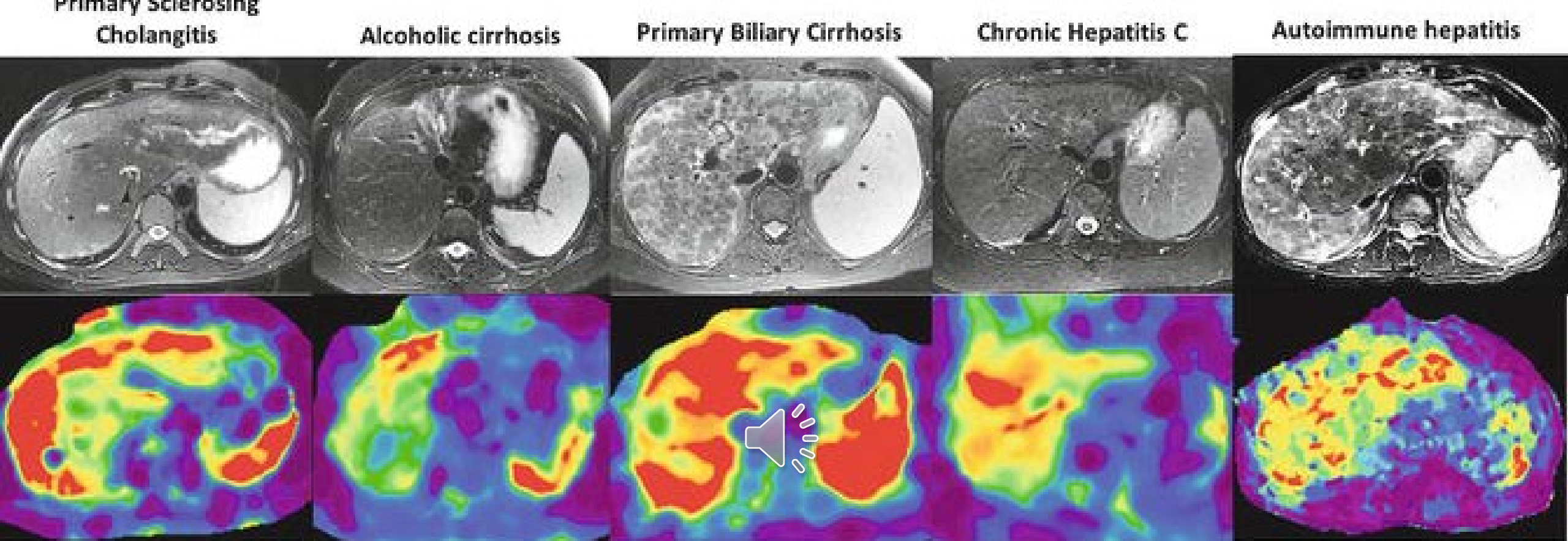


Years Old) With Metastatic Breast
gadolinium-enhanced MRI (A) shows
liver metastases (arrows). Coronal
MRI with fat suppression (B) depicts
ous metastases (arrows) in the thoracic

Lever, Onk/Pat



Lever, Järn



Lever, Elastografi



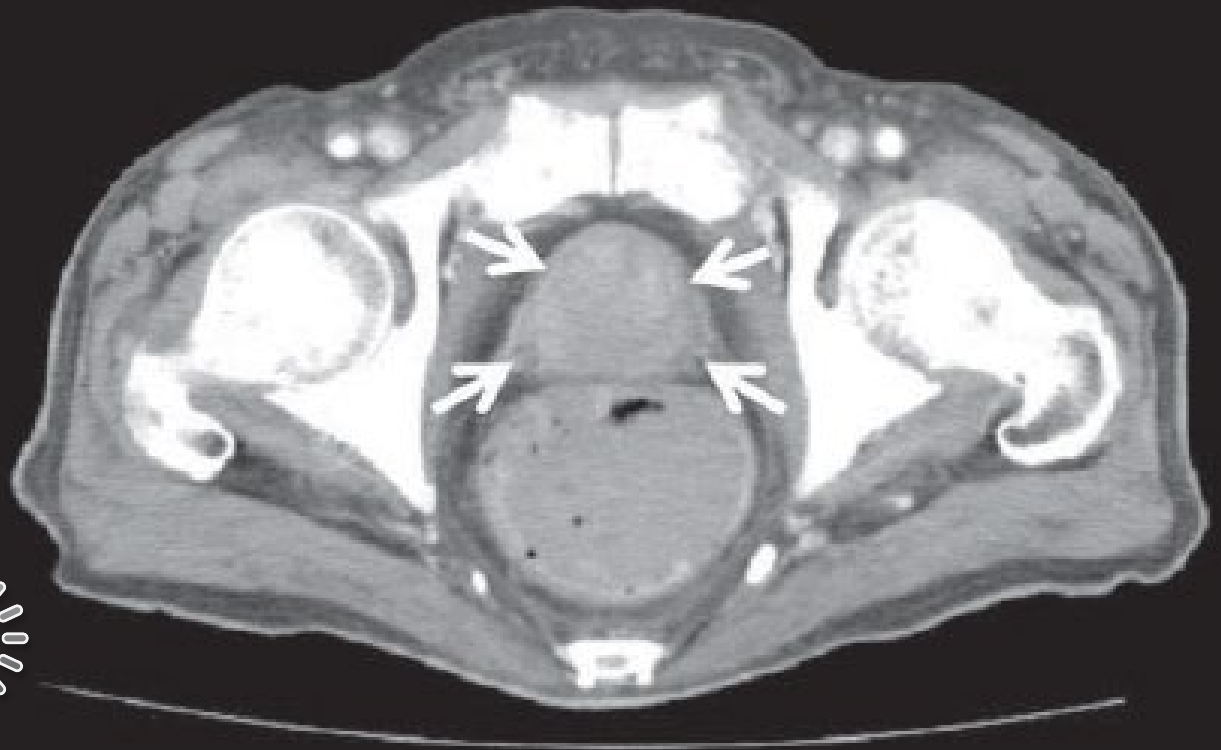
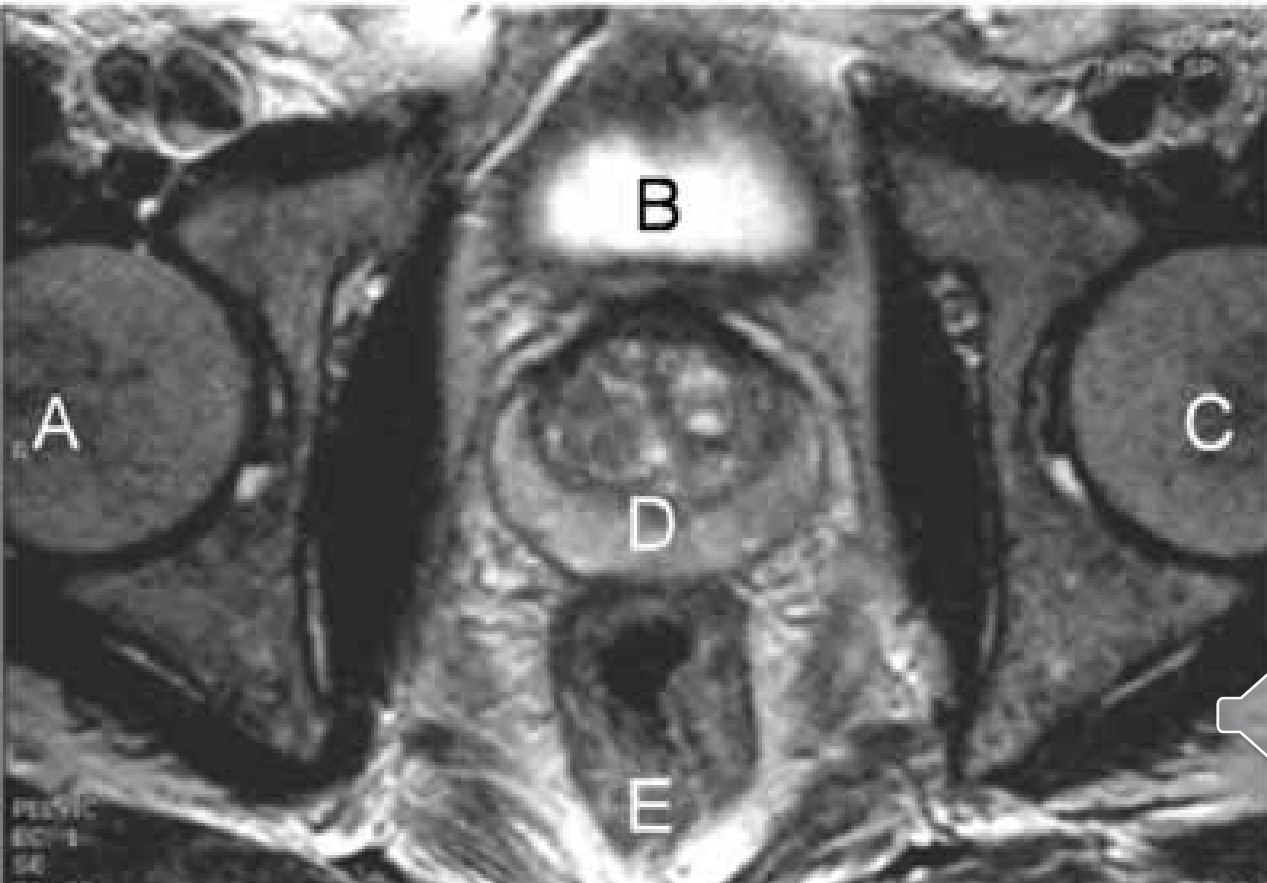
A



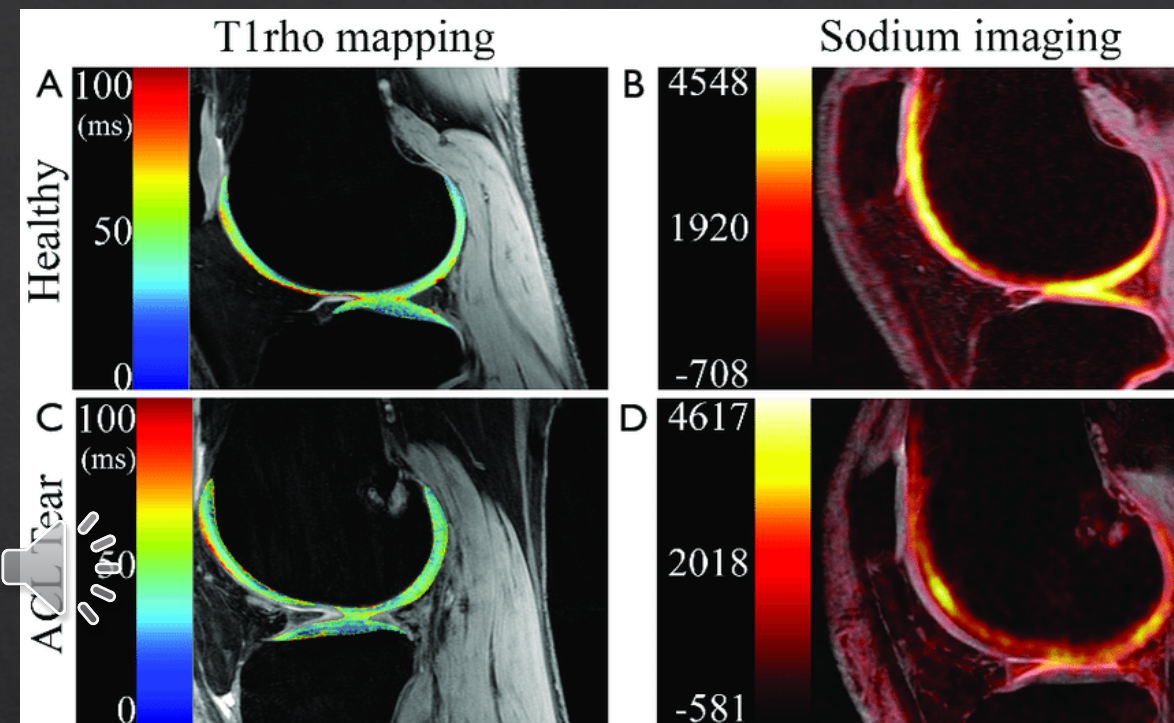
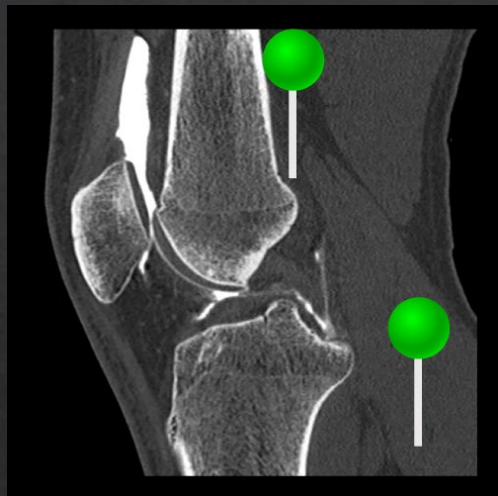
B

Figure 2. A: Sagittal T2-weighted TSE sequence, hyperintense uterine cervix tumor. Part of the (hypointense) cervical stroma is intact. Preserved vaginal canal (stage Ib). **B:** Sagittal T2-weighted TSE sequence, slightly hyperintense tumor in the posterior portion of the uterine cervix, extending to the upper vaginal third (stage IIa).

Buk

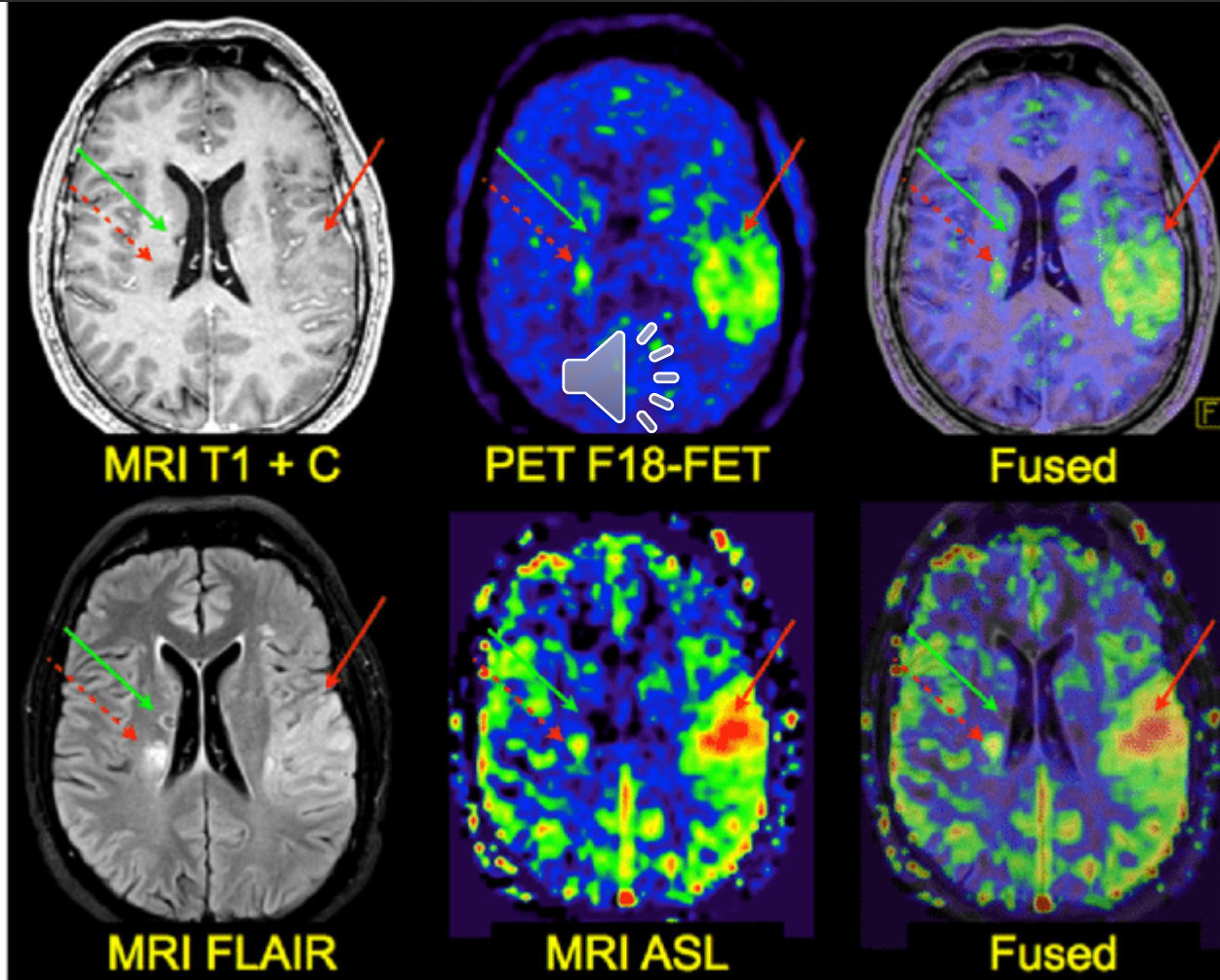


Buk, Prostata

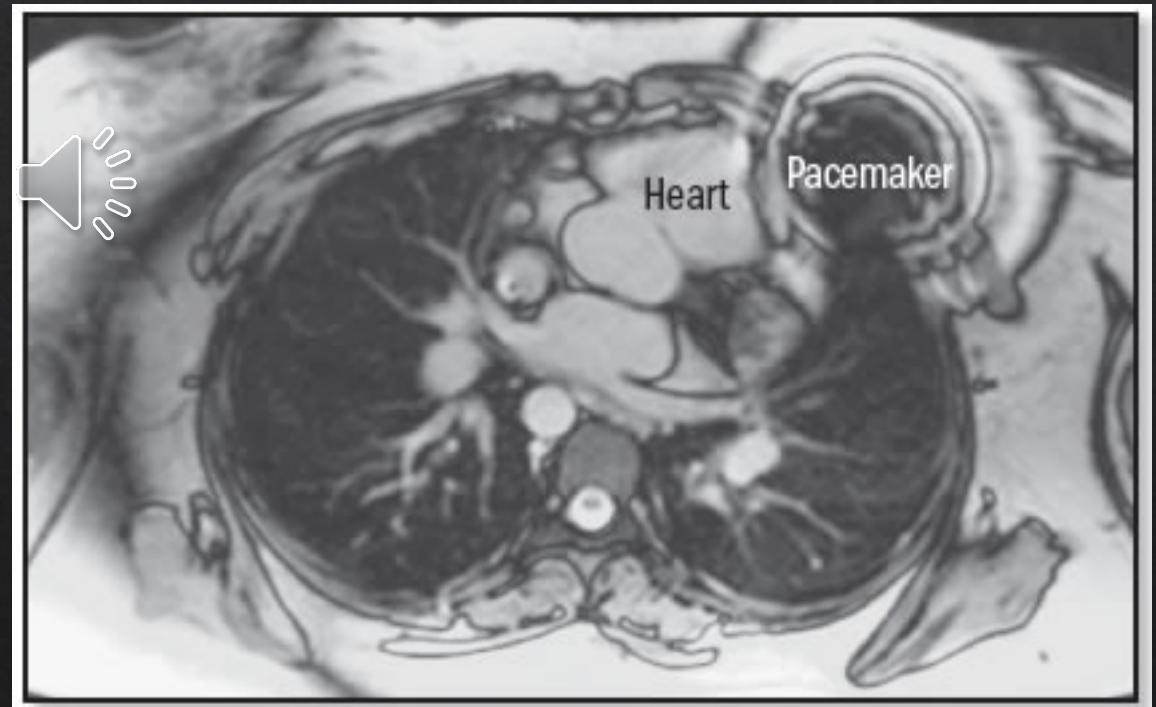
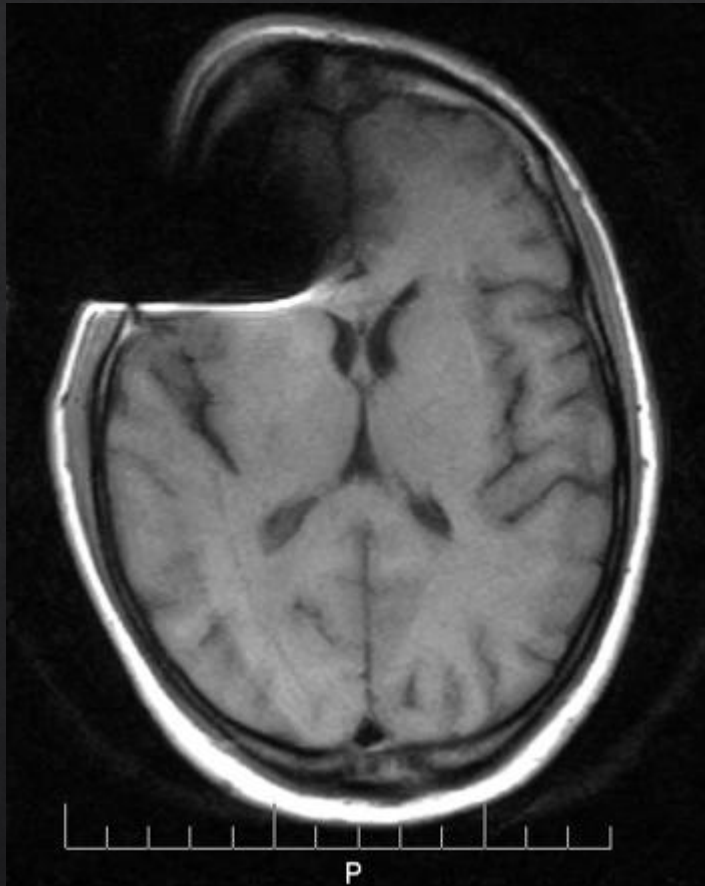


MSK

Fusion, PET/MR



Nackdelar – Metal/Elektronik



Does Electronic Identification Enablement for Silicone Gel Implants Impact Patient Safety?

Michael T Nelson¹, Kurt A Brattain² and Jeffrey M Williams^{3*}

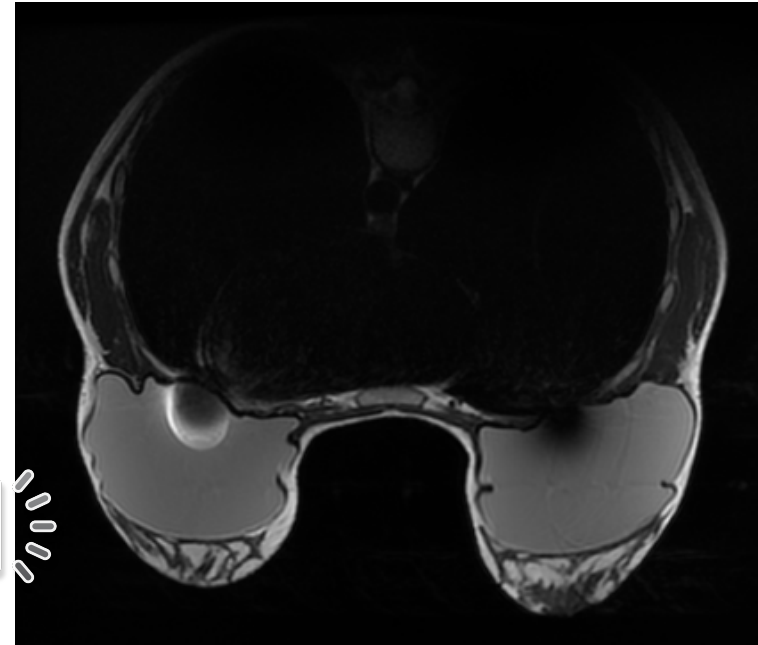
Further investigation is needed to completely address the use of RFID-M technology in silicone gel-filled breast implants and in other implantable medical devices, yet the preliminary results are promising. These early risk impact assessments RFID-M presences in the Motiva Implants® with Q Safety Inside Technology contributes to the overall safety of the patient when dual-modality imaging is utilized during cancer surveillance in high-risk patients.



YOUR RIGHT TO BE INFORMED

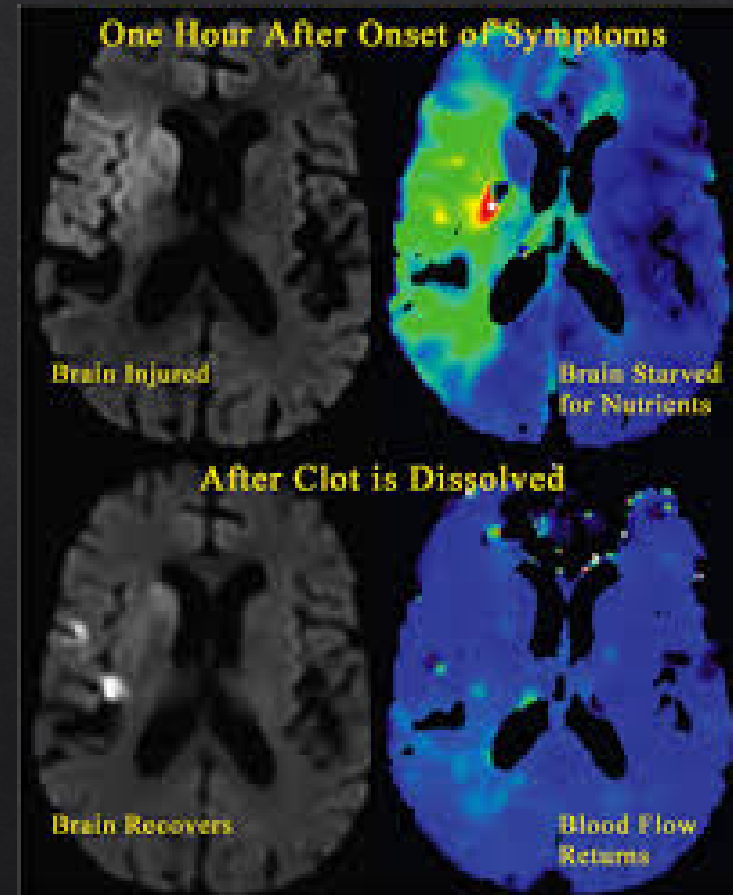
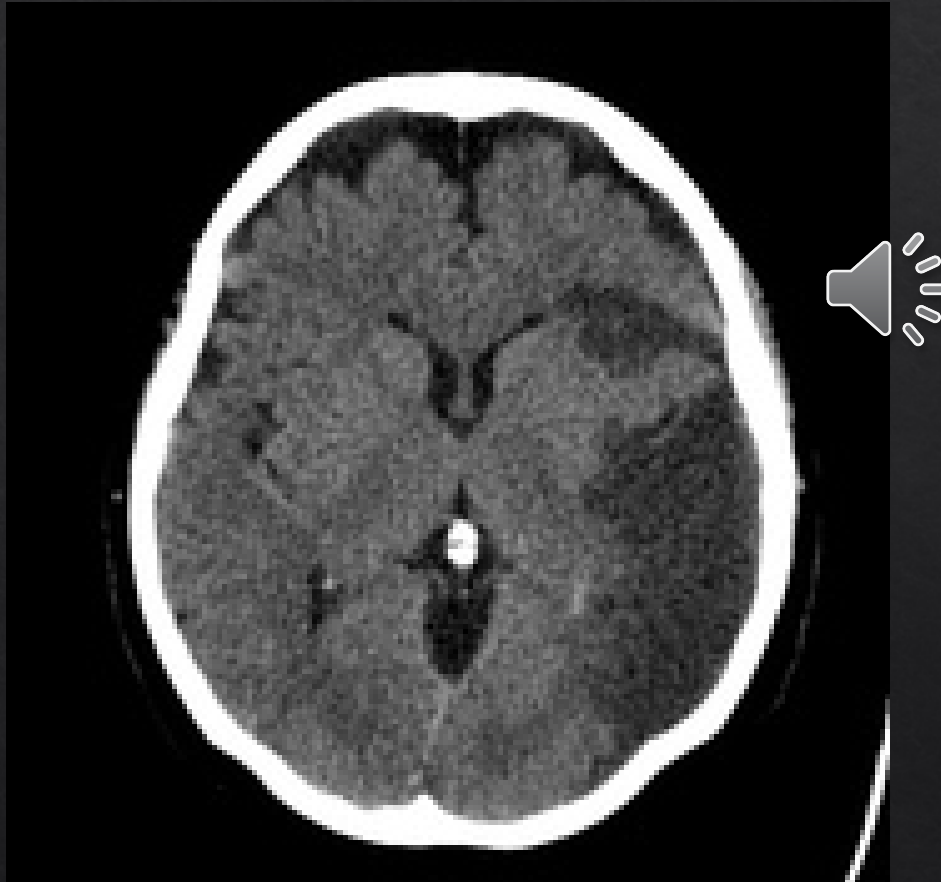
You now have a right to access all the information regarding your breast implants, at all times including notifications and instructions, if their device has been the subject of a safety advisory.

You are informed in real time through the MotivaImagine™ App of the written policies and procedures regarding your product warranty and the possibility of financial support in case of a replacement surgery.

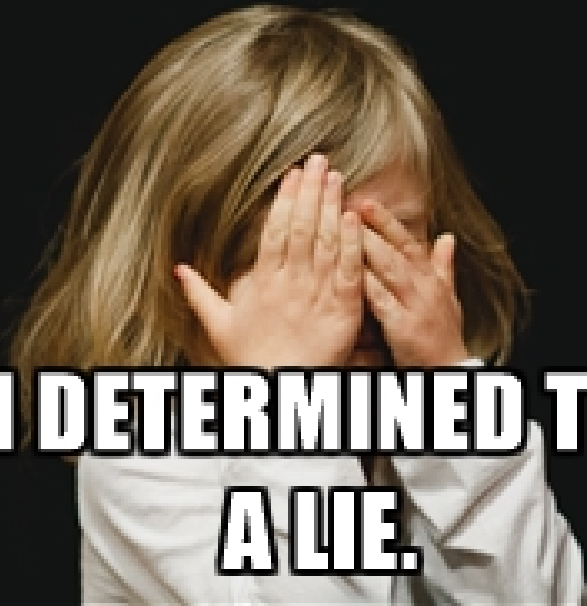


Nyhet inom plastik kirurgi

Nackdelar - Stroke



**I TOLD MYSELF I WASN'T
CLAUSTROPHOBIC**



**THE MRI DETERMINED THAT WAS
A LIE.**

memegenerator.net

**OH, YOU ARE INCREDIBLY UNCOMFORTABLE
AND NOT ALLOWED TO MOVE?**



**LET ME SING YOU
THE SONG OF MY PEOPLE**

quickmeme.com

Nackdelar - klaustrofobi/ljud