

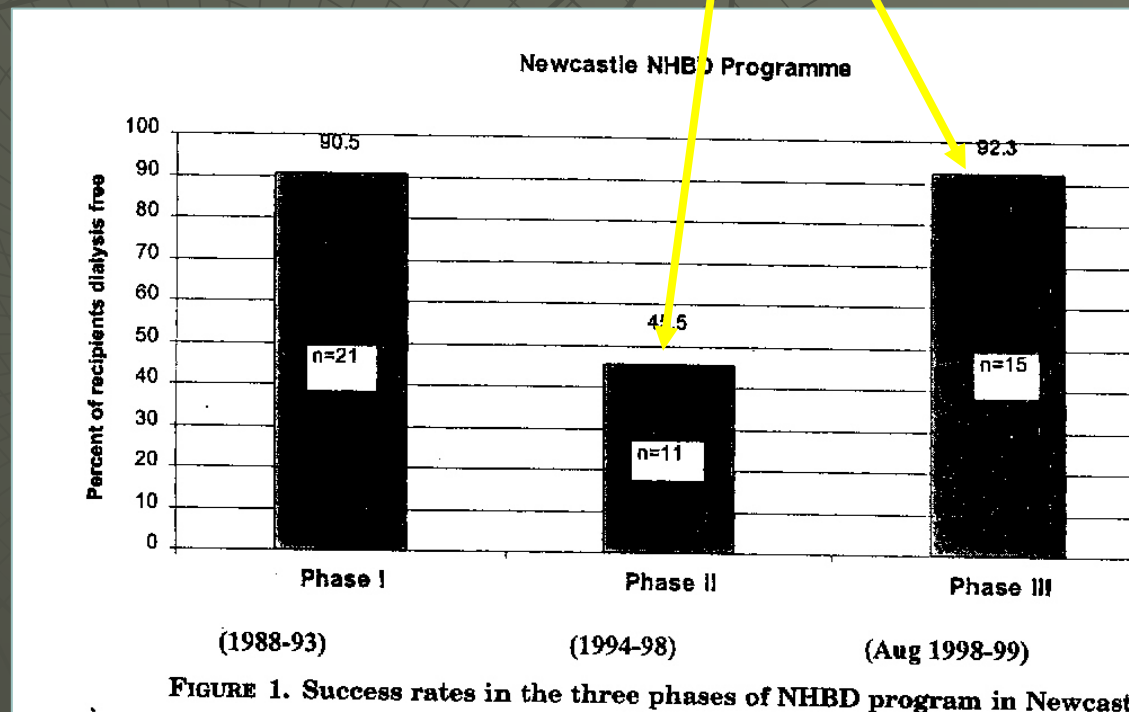
**MARGINAL ORGANS REANIMATION
WITH HPP + O₂
TESTED BY
“INTENSIVE MAGNETIC RESONANCE
DIAGNOSIS” (IMRD).**

What are “marginal” organs ?

- ◆ Organs from donors after unsuccessful reanimations
- ◆ Organs from NHBD (Maastricht classification : II and I)
- ◆ **Organs from elderly donors**

The necessity of a specific treatment for marginal kidneys ? **YES : THE PERFUSION!** As demonstrated :

- Phase I : NHBD Maastricht III
(immediate cannulation after cardiac arrest)
- Phase II : NHBD Maastricht II (**without perfusion**)
(DBTL ; 30' absence of circulation \neq WI)
- Phase III : NHBD Maastricht II (**with perfusion**)
(DBTL ; 30' absence of circulation \neq WI)



What we do and what we know in marginal organs' reanimation ?

1. We conduce their reanimation with HPP + O₂ which is necessary for marginal organs.
2. We control it through Intensive Magnetic Resonance Diagnosis (IMRD).

The international agreements in perfusion parameters for marginal organs

- ◆ Hypothermic perfusion (2 – 8 ° C)
- ◆ Pulsatile perfusion (max. Syst. Pressure : 50 mmHg)
- ◆ Optimization of flow (0.5 ml/g/min)
- ◆ +/- pO₂ : 500 mmHg
- ◆ Duration of perfusion : 8 H.
- ◆ Perfusion medium : UW-G
- ◆ Biological and perfusionnal tests

The Geneva's agreement in perfusion parameters for marginal organs

- ◆ Hypothermic perfusion (2 – 8 ° C)
- ◆ Pulsatile perfusion (max. Syst. Pressure : 50 mmHg)
- ◆ Optimization of flow (0.5 ml/g/min) : **NO**
- ◆ pO₂ : 500 mmHg: **NO** : 100 kPa is necessary!
- ◆ Duration of perfusion : 8 H.
- ◆ Perfusion medium : UW-G or Polysol or KPS-1
- ◆ **Biological and perfusionnal tests : NO**

Because of “IMRD” we have to use a MRI compatible technology

That means

1. Compatibility of the materials with magnetic fields
2. Compatibility with the technology of perfusion
3. Compatibility with geometry & physic of the MRI machine

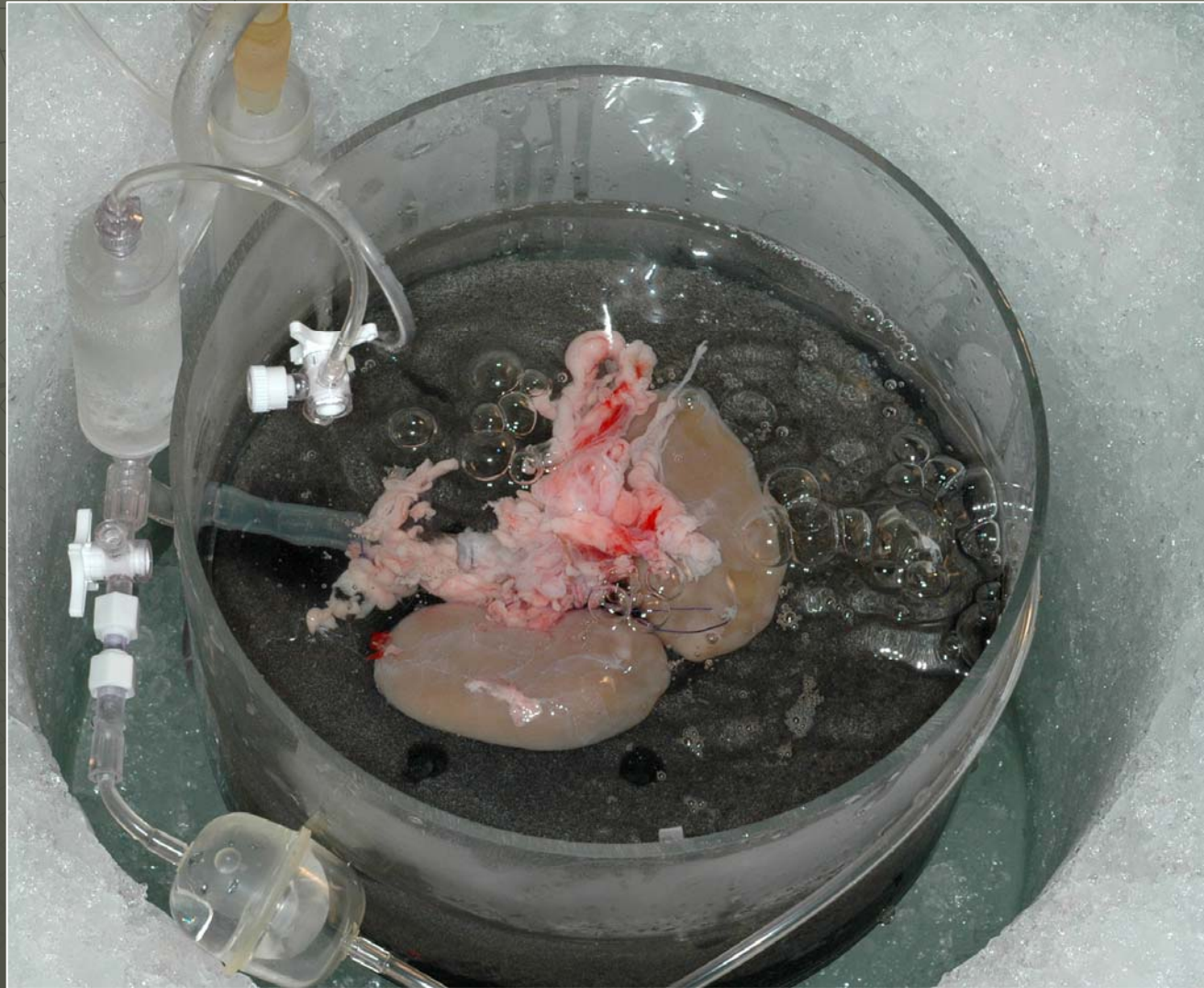
That has been resolved with this machine



The perfusion module of the machine in the bore of the MRI



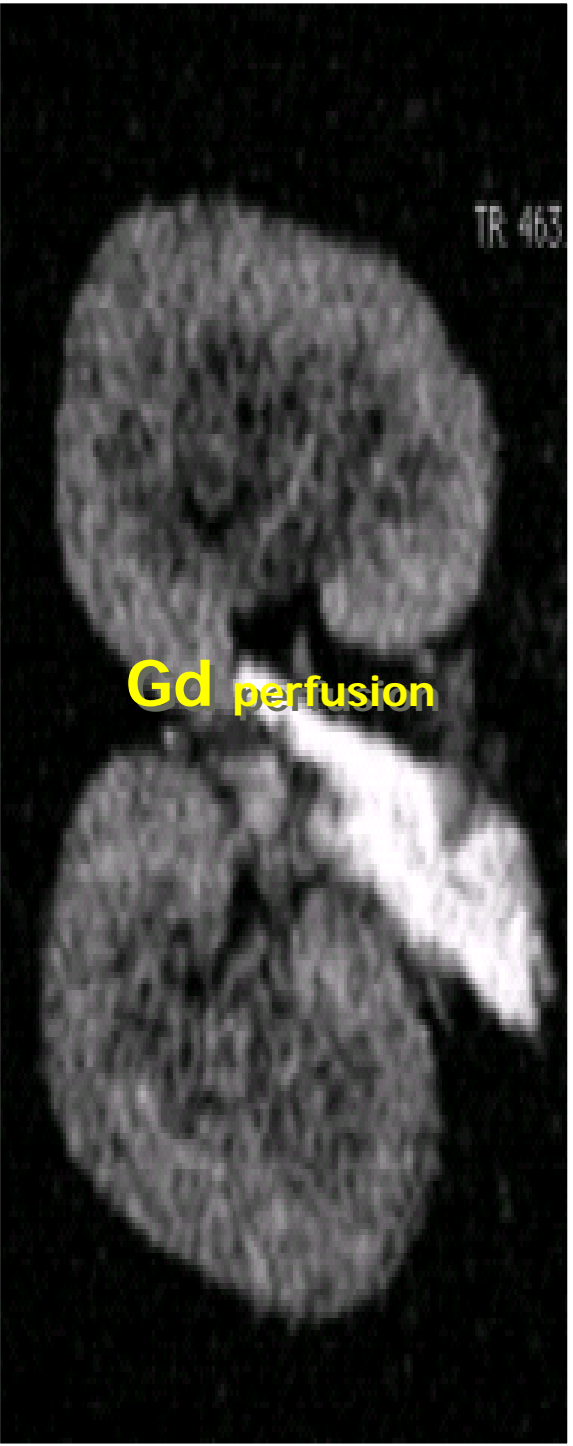
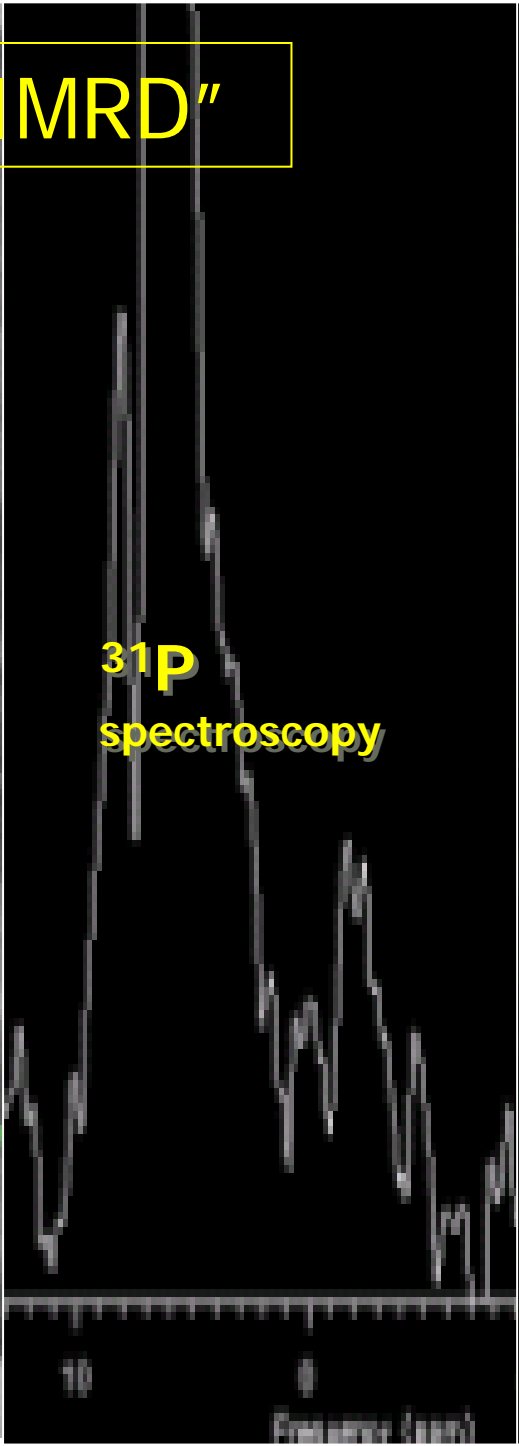
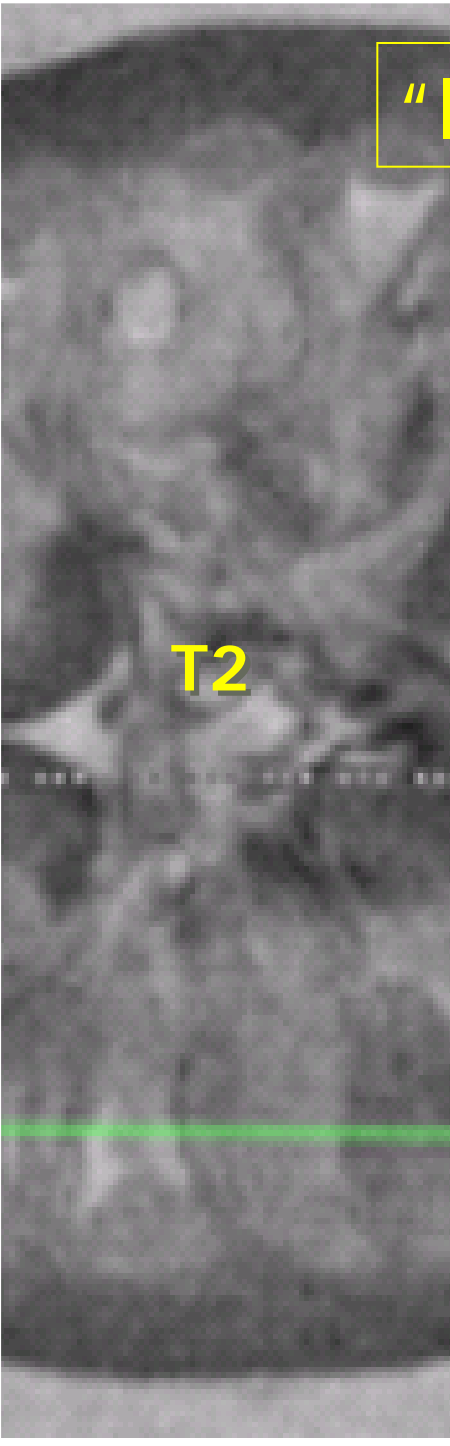
Kidneys perfusion



Research program in "IMRD"

The Geneva's applications to intensively document marginal organs before transplantation.

"IMRD"



T2

^{31}P
spectroscopy

Gd perfusion

T1 Fast Mapping for cortico-medullary gradient

At 37 °C

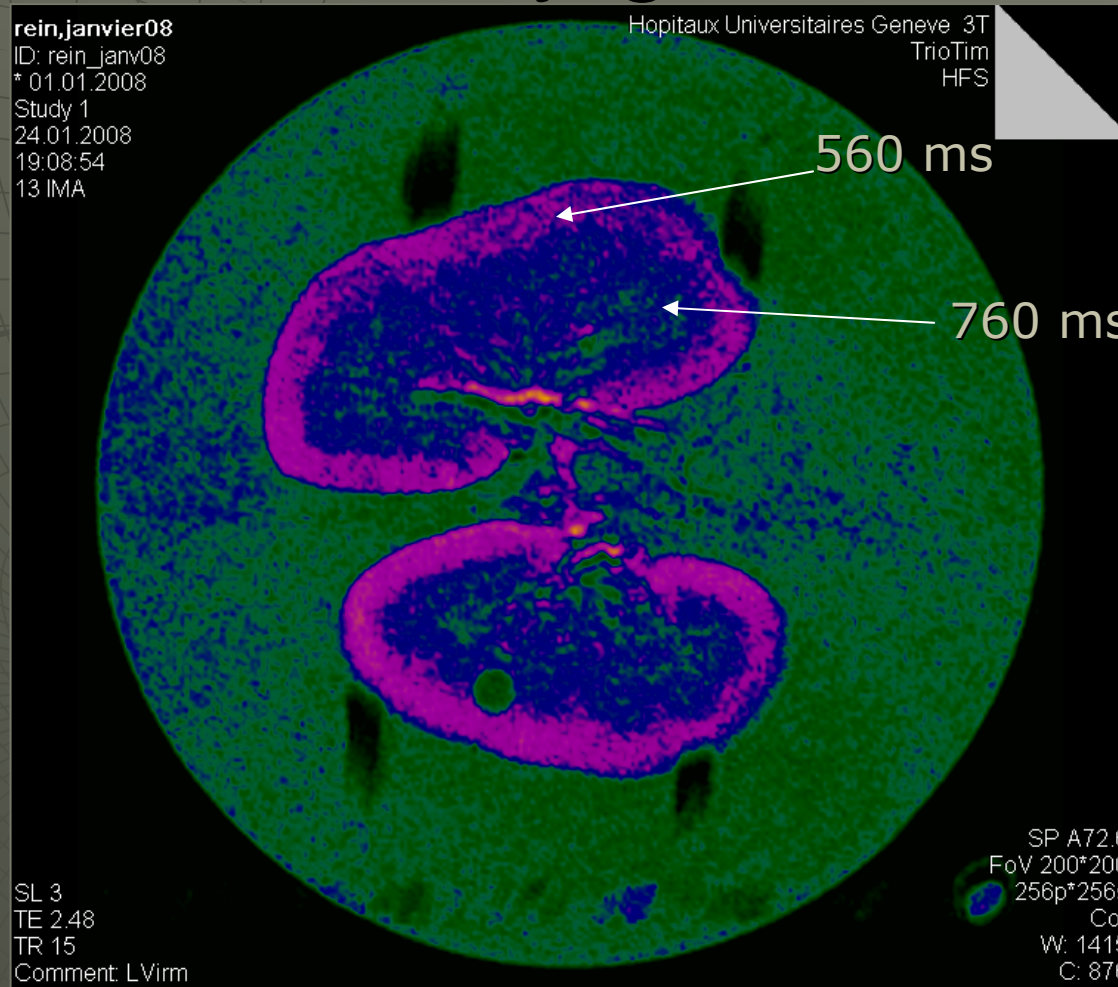
C: 970 ms

M: 1300 ms

+/- 60 ms

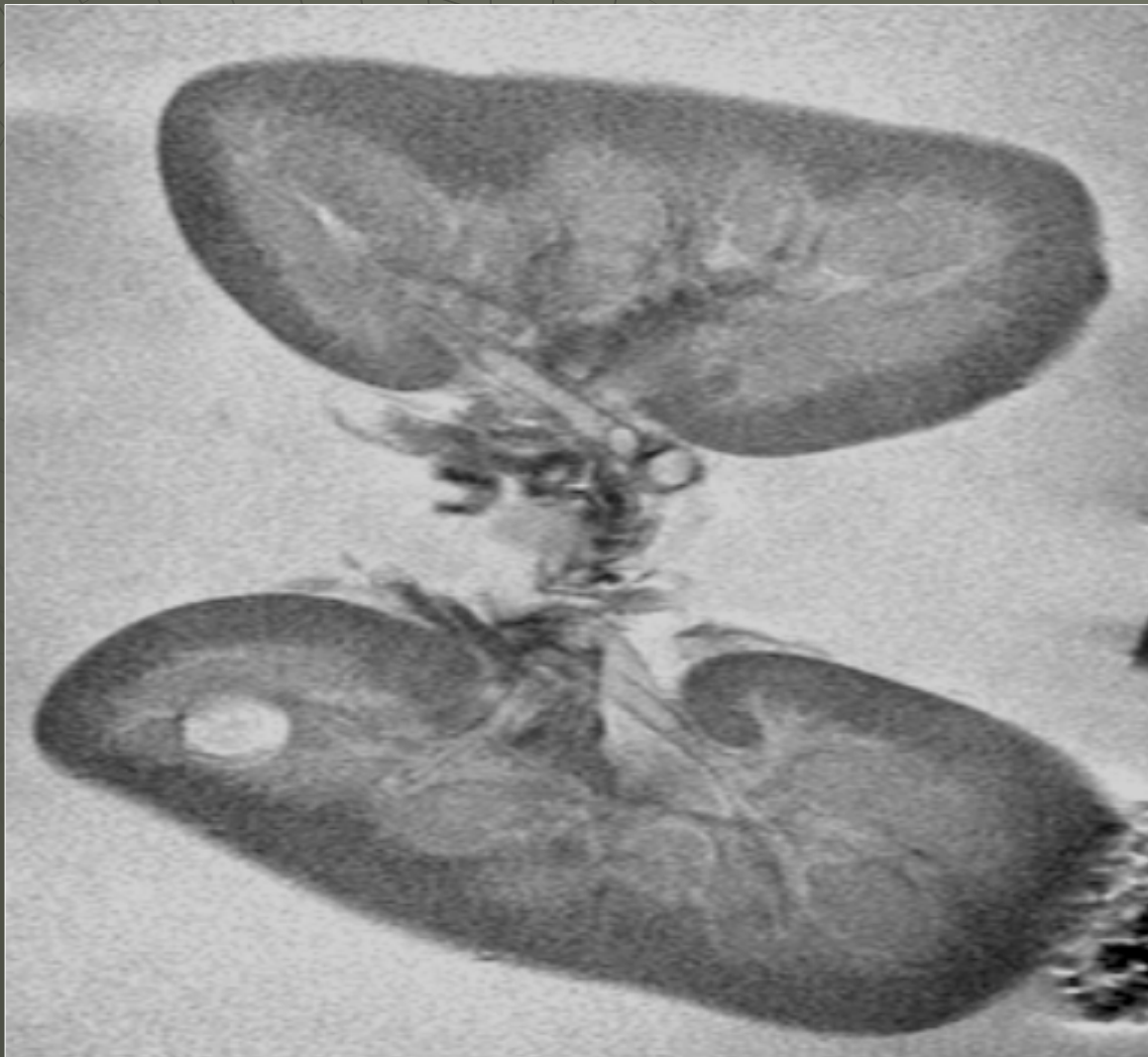
rein,janvier08
ID: rein_janv08
* 01.01.2008
Study 1
24.01.2008
19:08:54
13 IMA

Hopitaux Universitaires Geneve 3T
TrioTim
HFS



4°C
shortens
the signals
but the
difference
C & M
is the same

T2 for anatomico-pathological study

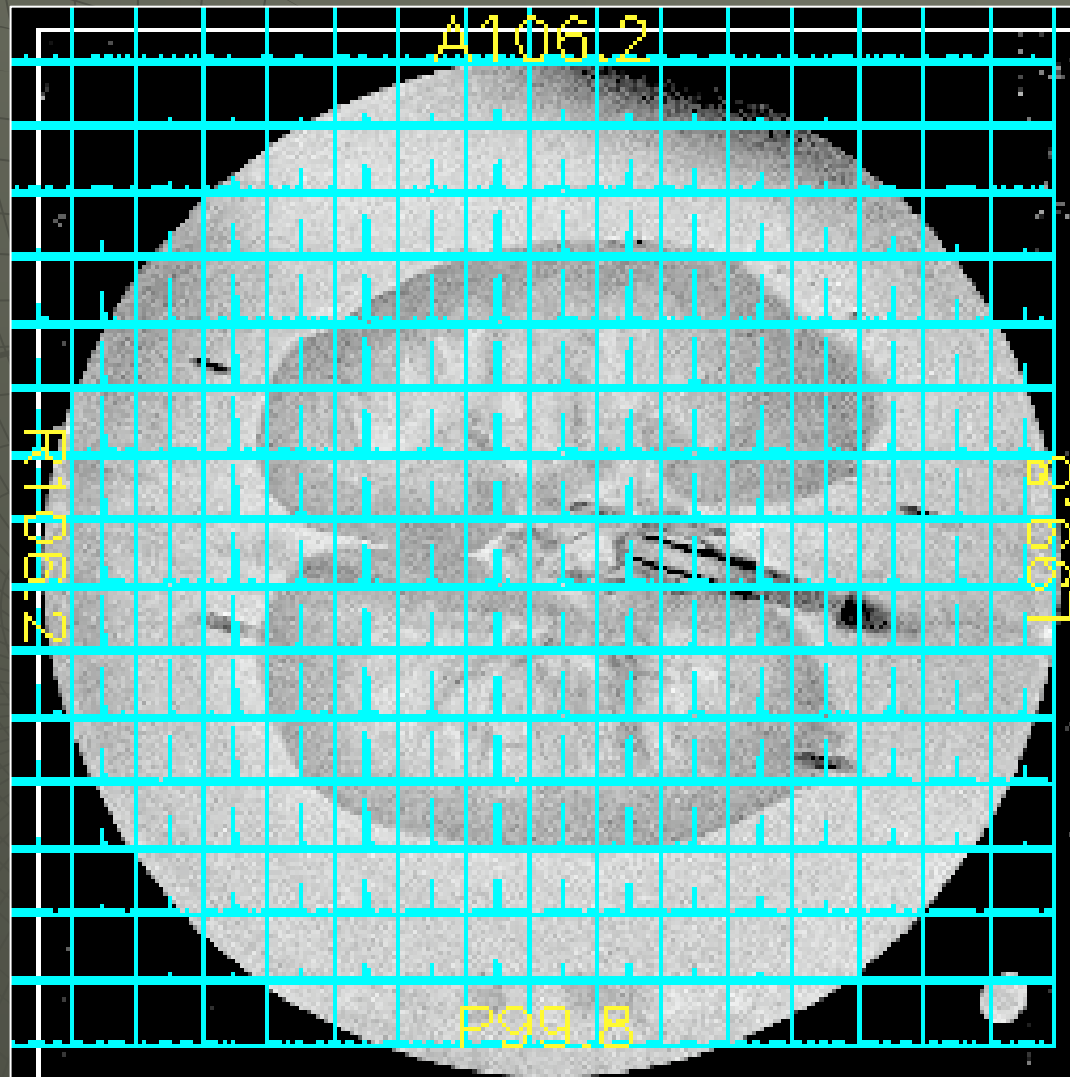


In elderly patients

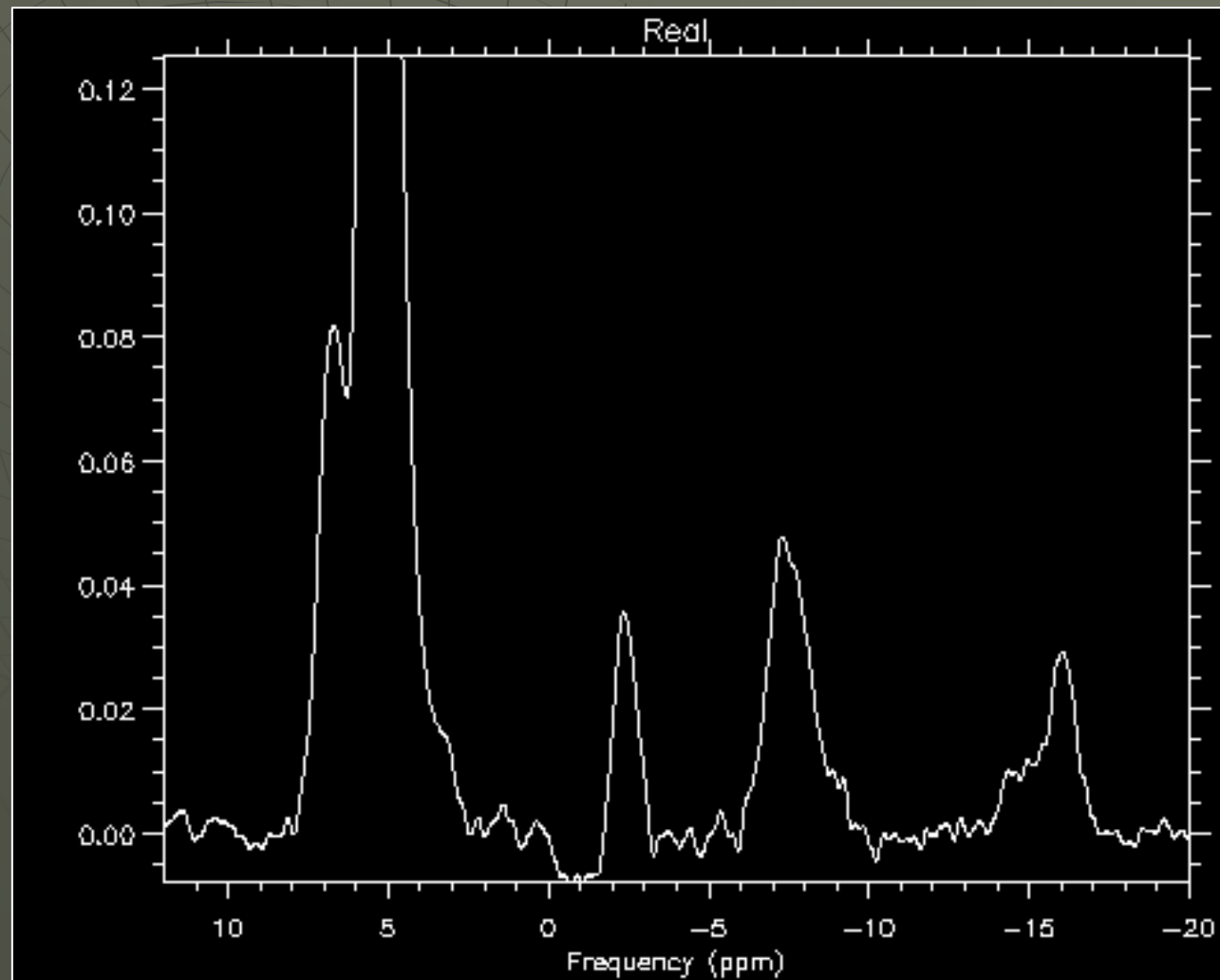
50 % of kidneys have a
cystic tumor < 3cm

15 % of malignant
tumors are cystic

^{31}P spectroscopy : Multi-voxel analysis (16x16x8 mm)

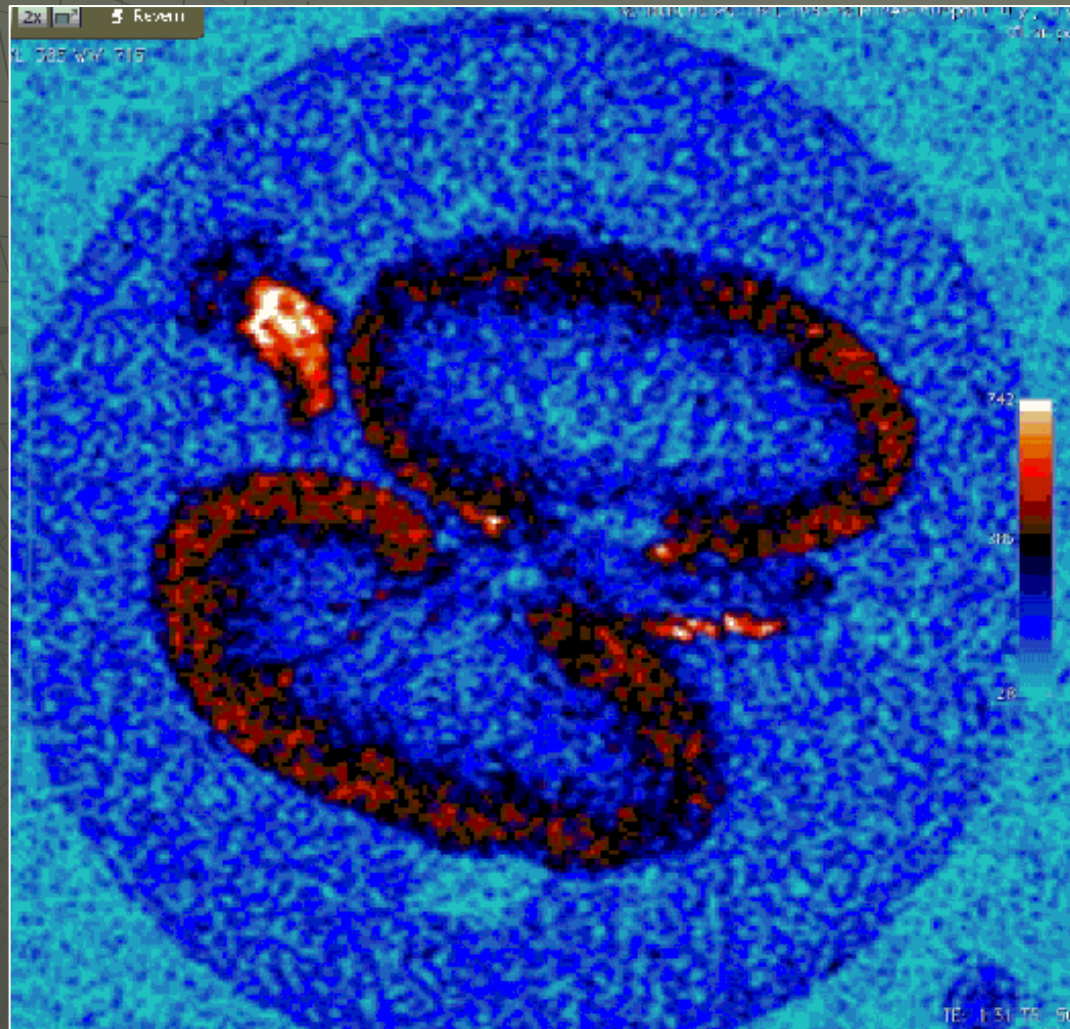


CSI ^{31}P MR SPECTROSCOPY

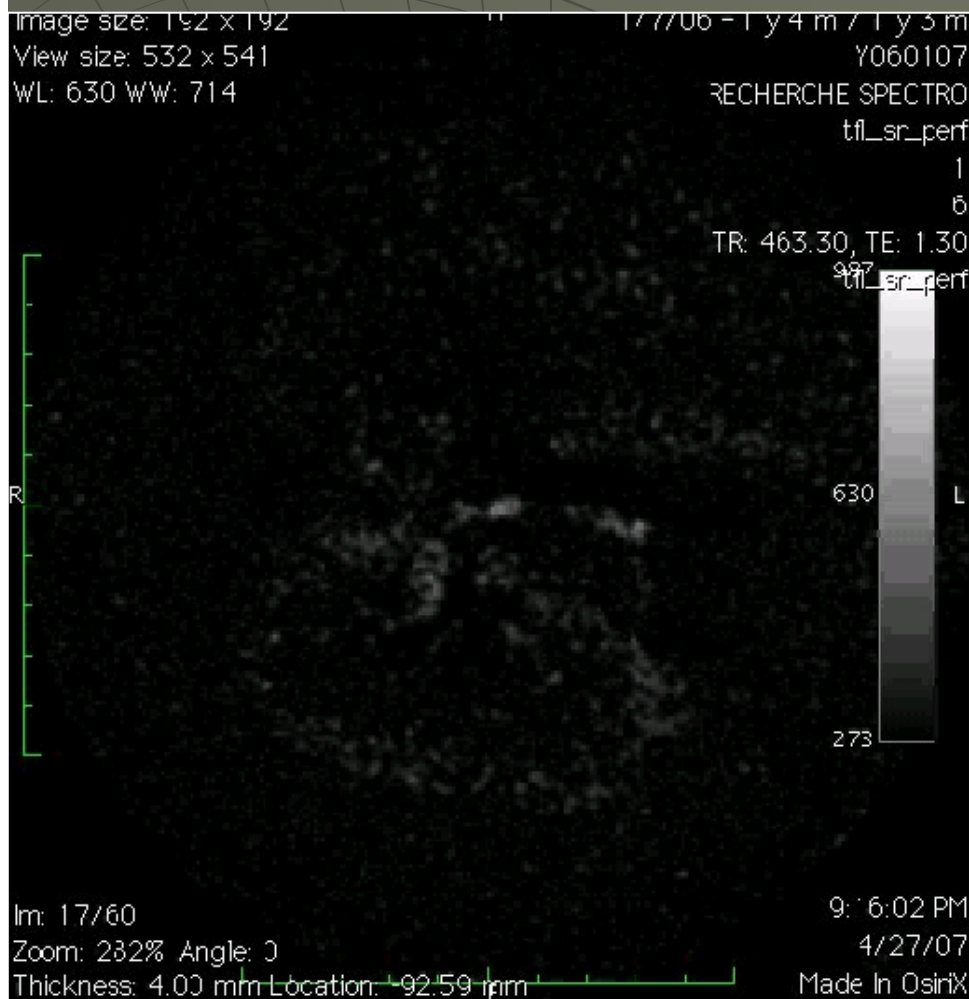


Presence of
ATP only in
reanimated
organs

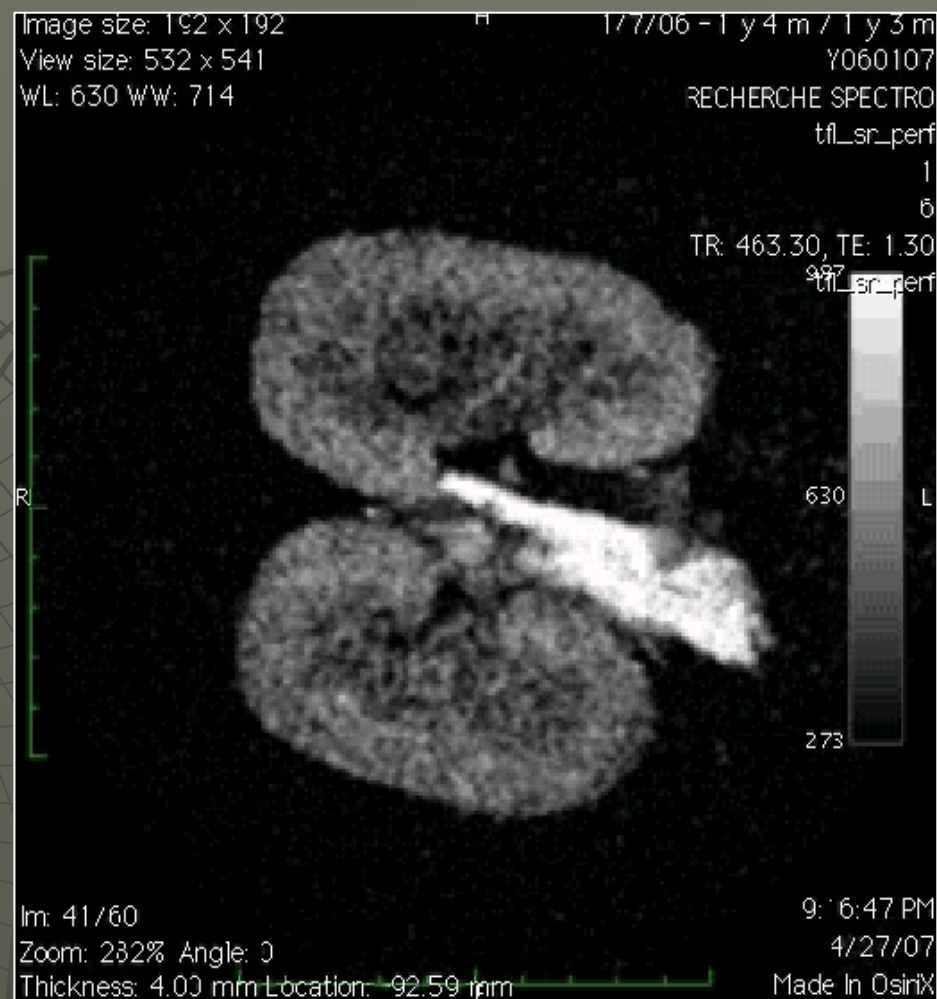
The Gadolinium perfusion as Perfusional Score



Dynamic perfusional studies : T0 and TP in good kidneys during HPP.



T0
20 sec.



TP
< 1 min

TEAM

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GRANTS

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-CIBM

-Journée de l'Innovation 2008

Laboratoire de Recherche et Développements Techniques