

CHOIX DES TECHNIQUES DE DIALYSE et IMPACT SUR LA QUALITE DE DIALYSE

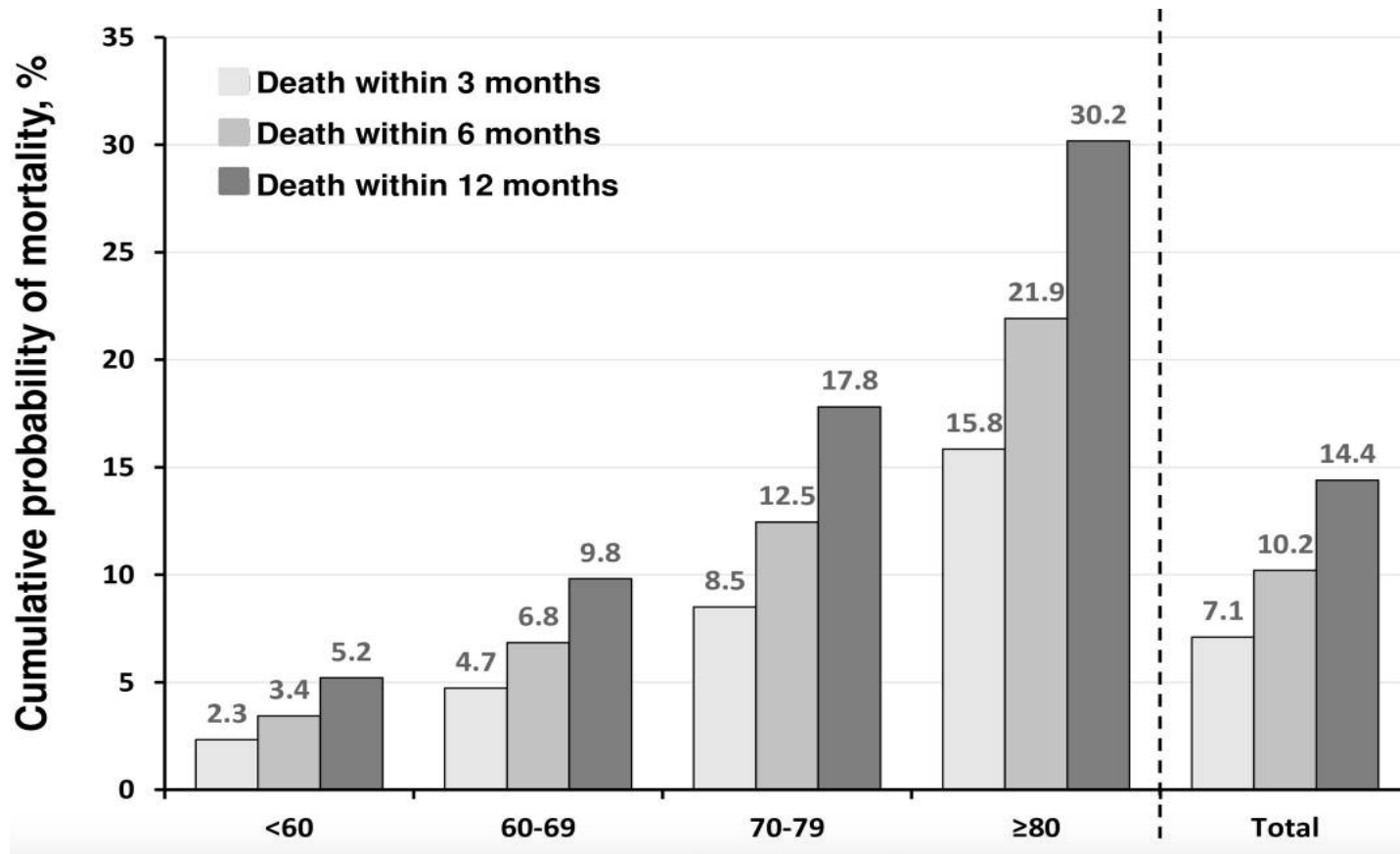
04/04/2019 RESIR

Typologie des patients

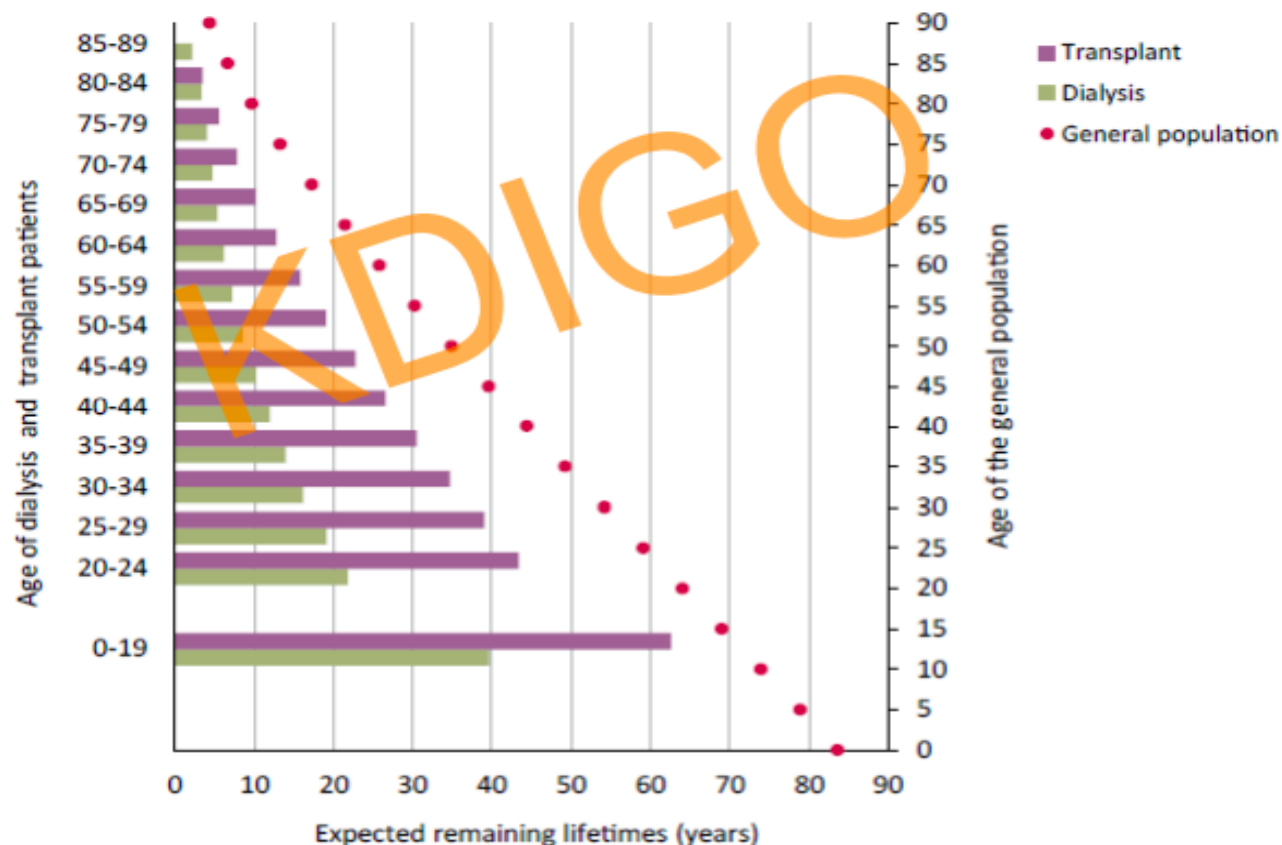
Quels patients soigne-t-on ?



L'IRC stade 5 c'est grave



Expected remaining lifetime (years) of the general population (cohort 2011-2015) and of prevalent dialysis and transplant patients (cohort 2011-2015)



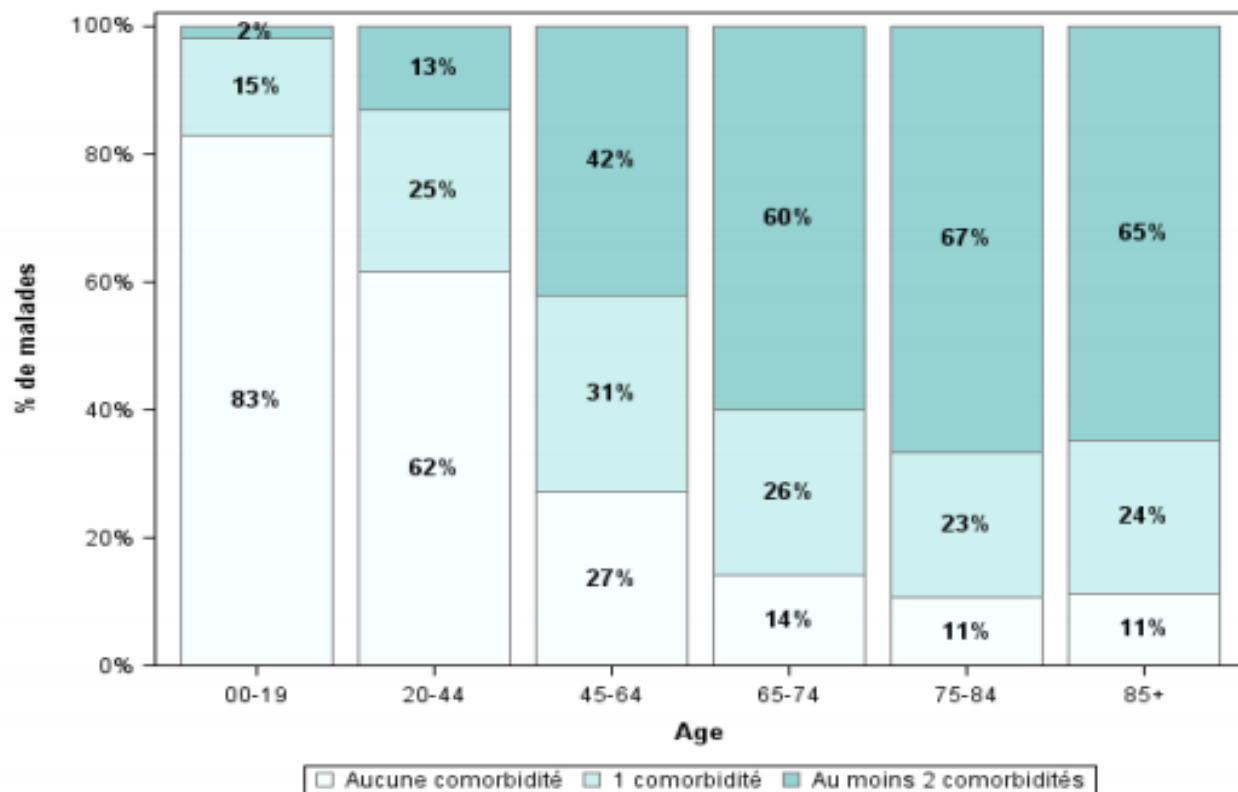


Figure 3-4. Nombre de comorbidités à l'initiation du traitement de suppléance selon l'âge
Number of comorbidities at start of dialysis, by age

Qualité de dialyse

Concept de dialyse adéquate

Multiples critères cliniques et biologiques !!

clinique TA, surcharge hydro-sodée, UF max 7-10 ml/kg/heure. hypoTA intra-D

Surcharge hydro sodée

Biologie (K⁺ Bicar Ca Ph PTH)

Toxines (urée, KT/V), moyennes molécules (vol convectif)

Mortalité

qualité de vie ++++

Poids sec



Cf topo de Sharif, éviter les hypoTA intra dialytiques



Box 4. Symptoms and Signs of Uremia

Symptoms

- Fatigue
- Lethargy
- Confusion
- Anorexia
- Nausea
- Alterations in senses of smell and taste
- Cramps
- Restless legs
- Sleep disturbances
- Pruritus

Signs

- Seizures/change in seizure threshold
- Amenorrhea
- Reduced core body temperature
- Protein-energy wasting
- Insulin resistance
- Heightened catabolism
- Serositis (pleuritis, pericarditis)
- Hiccups
- Platelet dysfunction
- Somnolence

Biologie

Hb : 10 -12 gr/dl

K⁺ < 5.5 mmol/l

Ca : 2 - 2,4 mmol/l

Phosphore : Normal

Bicar : 20 - 22 mmol/L

PTH : 2 - 9 N



Urée

$KT/V > 1.2$ minimum

KT/V idéal > 1.4

Small water soluble solutes

<500

Asymmetric dimethylarginine
Benzylalcohol
 β -Guanidinopropionic acid
 β -Lipotropin
Creatinine
Cytidine
Guanidine
Guanidinoacetic acid
Guanidinosuccinic acid
protein I
Hypoxanthine
peptide
Malondialdehyde
Methylguanidine
Myoinositol
Orotic acid
Orotidine
Oxalate
Pseudouridine
Symmetric dimethylarginine
Urea
Uric acid
Xanthine
*CMPF is carboxy-methyl-propyl-furanpropionic acid
alpha

Protein-bound solutes

500 - 15000

3-Deoxyglucosone
CMPF*
Fructoselysine
Glyoxal
Hippuric acid
Homocysteine
Hydroquinone
Indole-3-acetic acid
Indoxyl sulfate

Kinurenine

Kynurenic acid
Methylglyoxal
N-carboxymethyllysine
P-cresol
Pentosidine
Phenol
P-OH-hippuric acid
Quinolinic acid
Spermidine
Spermine

Middle

> 15000

Molecular Weight
(Daltons)

Adrenomedullin
Atrial natriuretic peptide
 β_2 -Microglobulin
 β -Endorphin
Cholecystokinin
Clara cell protein
Complement factor D
Cystatin C
Degranulation inhibiting

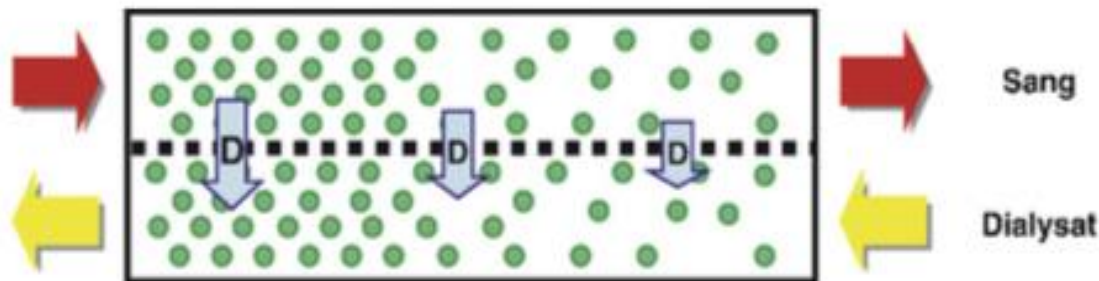
Delta-sleep-inducing

Endothelin
Hyaluronic acid
Interleukin 18
Interleukin 6
Kappa-Ig light chain
Lambda-Ig light chain
Leptin
Methionine-enkephalin
Neuropeptide Y
Parathyroid hormone
Retinol binding protein
Tumor necrosis factor



Techniques de dialyse

Diffusion (D)
transmembranaire

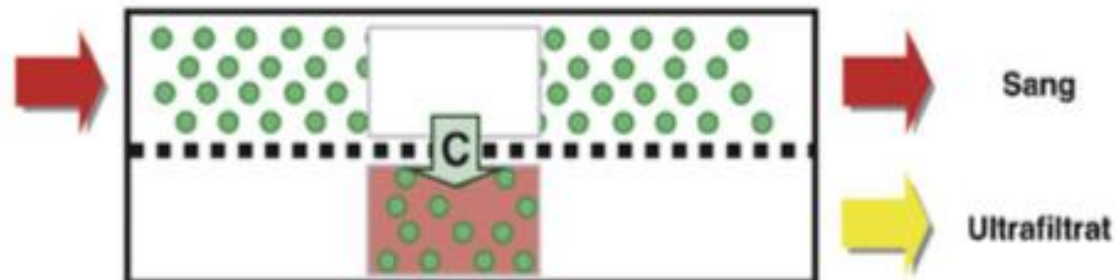


Sang

Gradient de
concentration

Dialysat

Convection (C)
transmembranaire

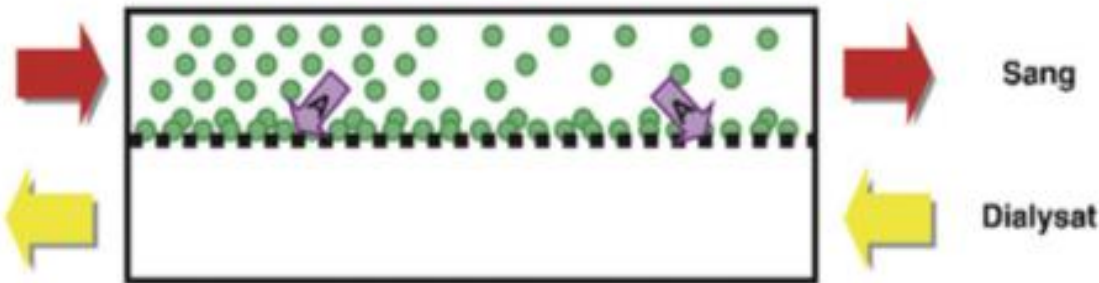


Sang

Gradient de
pression

Ultrafiltrat

Adsorption (A)
membranaire



Sang

Gradient
d'affinité

Dialysat

Hémodialyse conventionnelle

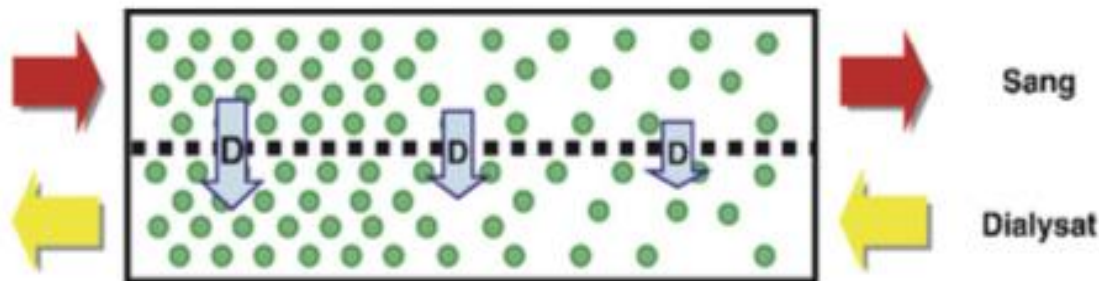
Bonne épuration des toxines de bas poids moléculaire et correction des troubles hydroélectrolytiques

Urée créatinine acide urique

Potassium

bicarbonate calcium magnésium

Diffusion (D)
transmembranaire

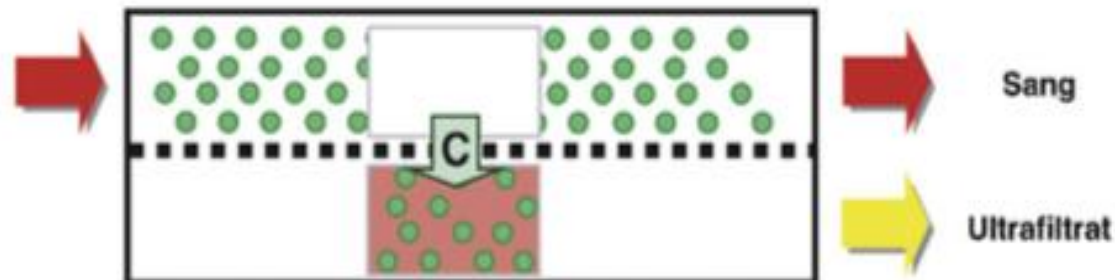


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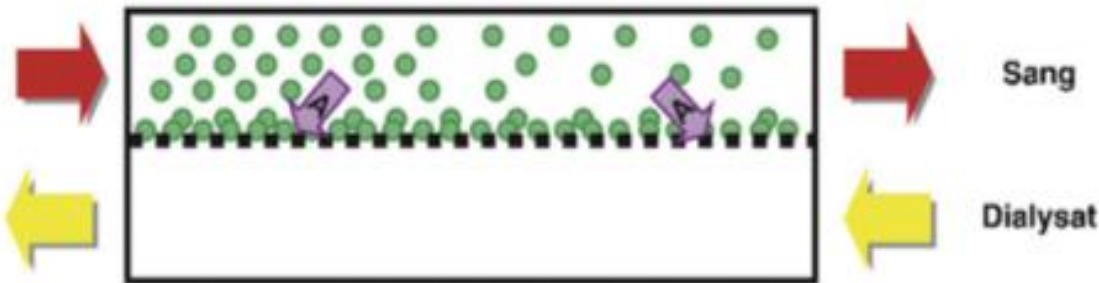


Sang

Gradient de
pression

Ultrafiltrat

Adsorption (A)
membranaire



Sang

Gradient
d'affinité

Dialysat

Homogènes
>20μ

Membranes Synthétiques

Membrane interne 0.5μ
Structure 35 à 45μ
Pores larges

Perméabilité+++

Symétriques

Méthodes Convectives

Asymétriques

Hydrophobes

PAN

PMMA

EVAL

Polycarbonate

Polyamide

Polysulfone

PolyEtherSulfone

+Sulfonates

+Methylacrylate

+PolyEther

+PVP

+PVP

+PVP

+Polyarylate

AN69 Hospal

PAN Asahi

BK U/P/F
BG U

Gambrane

?Polyflux

PS Fresenius
Helixone
APS (Asahi)
ToraySulfone
AlfaPS (Braun)
Rexeed(Hemotech)
Elisio (NIPRO)

Diapes
Arylane
Polyflux
Purema

PEPA

PVP-→FLX

PVP+

Pores St→FDX
Pores→→FDY

AN69ST

Ads.+++ E-

Conv.+++

Ads.++E-

HDF

Avantages :

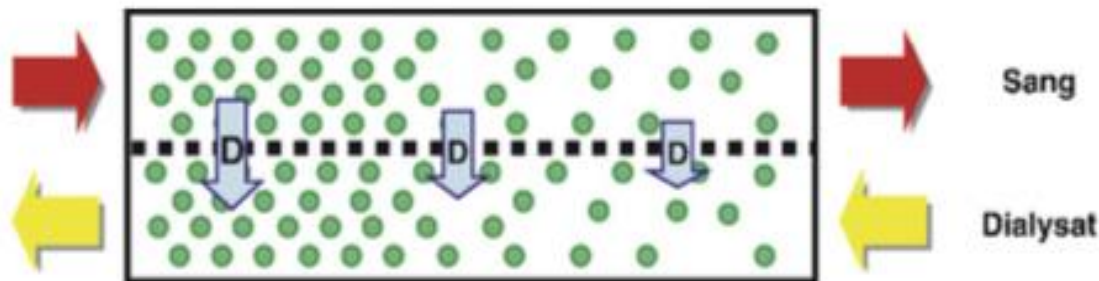
diffusion similaire à l'HD

mieux épurer les toxines de poids moléculaire moyen

Diminuer les hypotensions artérielles, les doses d'EPO

Inconvénients : dialysat ultra-pur, double filtration++ (risque de passage d'endotoxines). Perte d'albumine

Diffusion (D)
transmembranaire

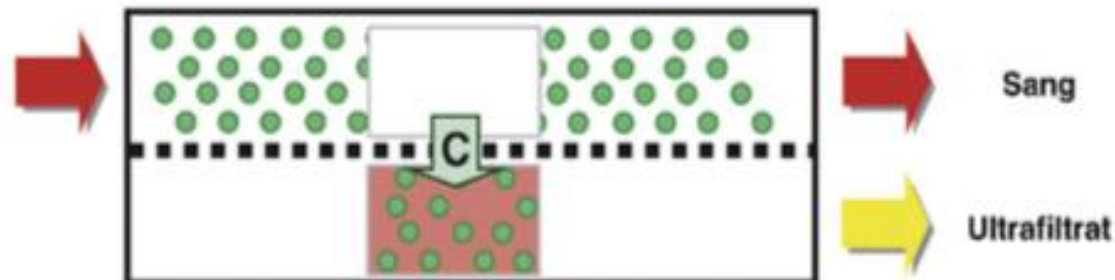


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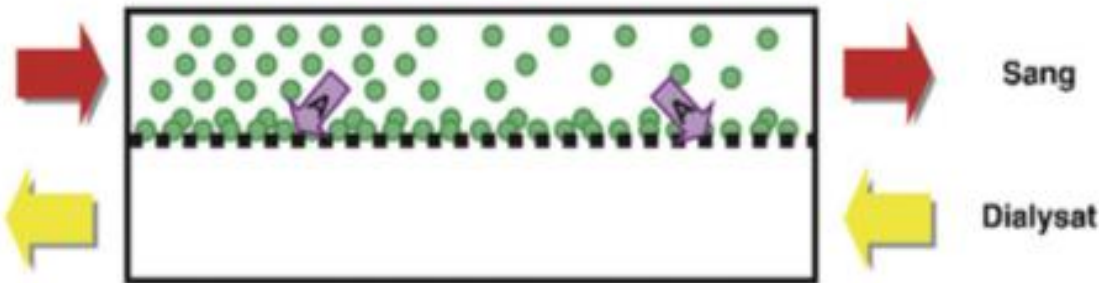


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Hypoxanthine
peptide
Malondialdehyde
Methylguanidine
Myoinositol
Orotic acid
Orotidine
Oxalate
Pseudouridine
Symmetric dimethylarginine
Urea
Uric acid
Xanthine
*CMPF is carboxy-methyl-propyl-furanpropionic acid
alpha

Protein-bound solutes

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3-Deoxyglucosone
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Hippuric acid
Homocysteine
Hydroquinone
Indole-3-acetic acid
Indoxyl sulfate

Kinurenine

Kynurenic acid
Methylglyoxal
N-carboxymethyllysine
P-cresol
Pentosidine
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P-OH-hippuric acid
Quinolinic acid
Spermidine
Spermine

Middle

> 15000

Molecular Weight
(Daltons)

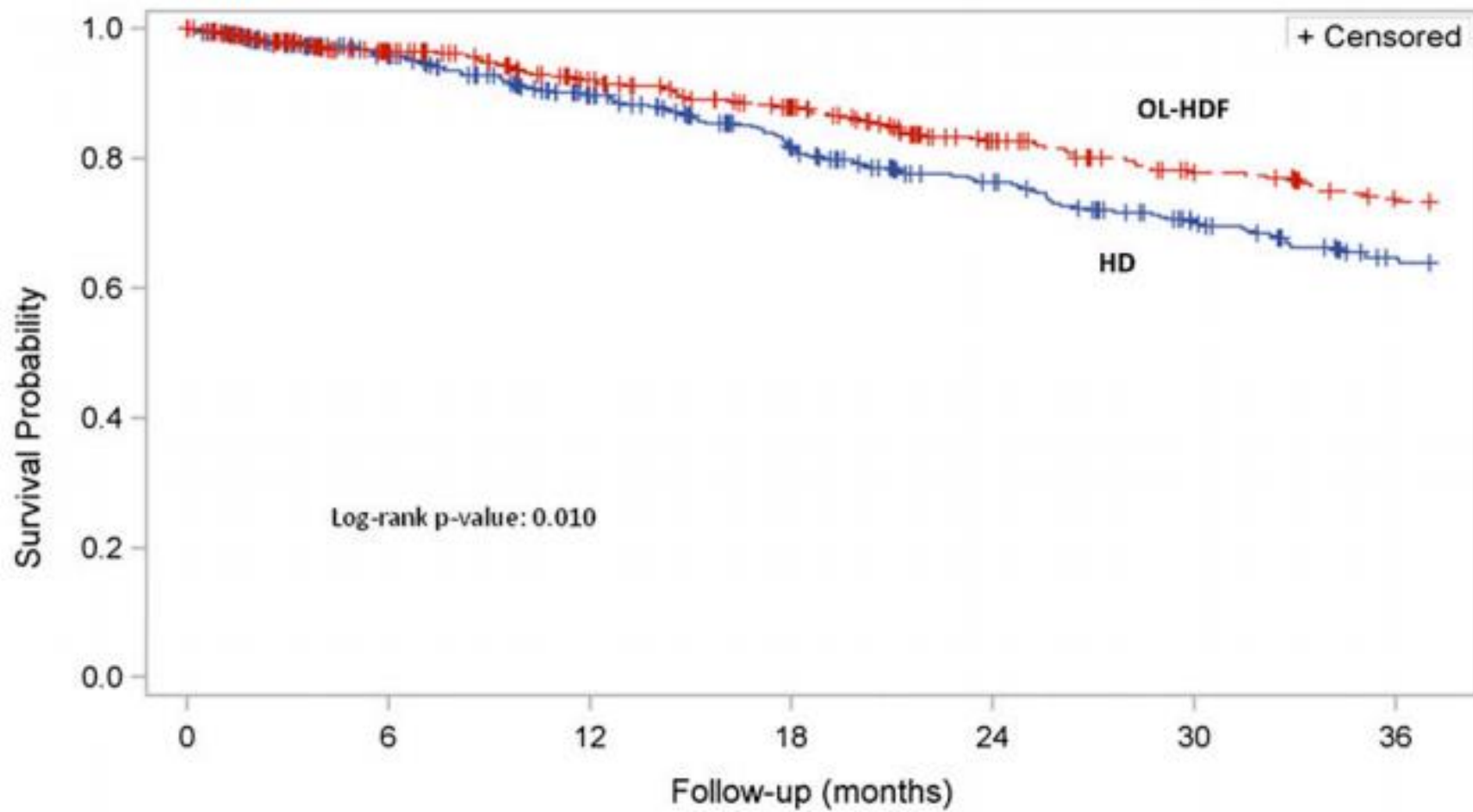
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Methionine-enkephalin
Neuropeptide Y
Parathyroid hormone
Retinol binding protein
Tumor necrosis factor



High-Efficiency Postdilution Online Hemodiafiltration Reduces All-Cause Mortality in Hemodialysis Patients



objectif : **23 LITRES** de volume convectif par séance en post-dilution

Volume convectif = volume de substitution + **UF**

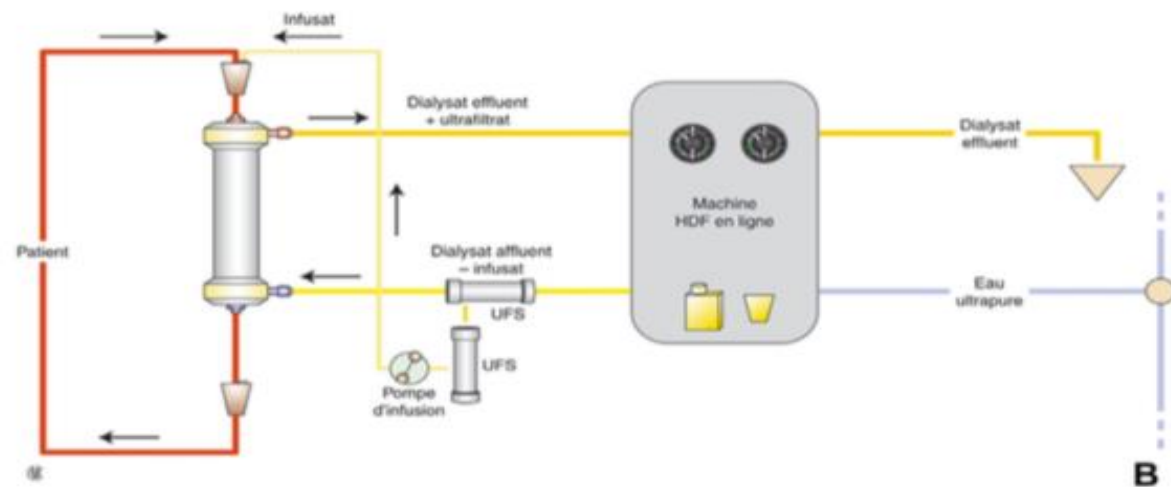
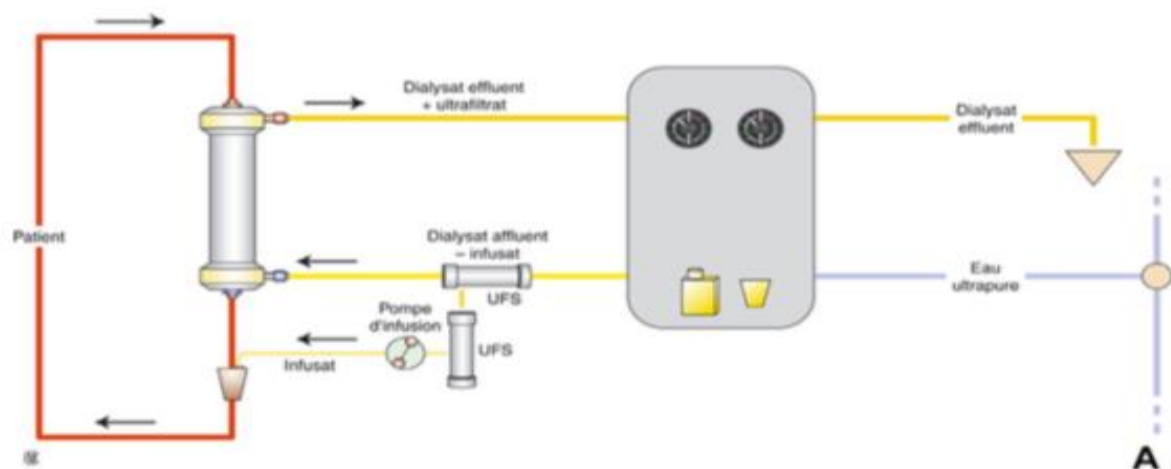
Autres effets +

Diminution des hypoTA intra-dialytiques (effet thermique)

Diminution des doses d'EPO

Table 1 Recommendations to obtain the optimal high volume post-dilution OL-HDF dose

	Prescription	Recommendations
Vascular access	Arteriovenous fistula or graft central venous catheter	First option increase session duration
Access blood flow rate (Q_b)	350–500 ml/min	The maximum possible
Dialysate flow rate	400–500 ml/min + infusion flow rate	No influence on convective dose
Infusion flow rate	25–33 % of Q_b , 90–160 ml/min	The maximum possible
Session duration	4.0–5.0 h/session	The maximum possible
Convective volume (replacement volume + intradialytic weight loss)	>23 l/session	The maximum possible
Percent convective volume of the blood volume processed	25–30 %	The maximum possible
Dialyzer	High-flux membrane	Ultrafiltration coefficient >20 ml/h/mmHg/m ² ; sieving coefficient for β_2 microglobulin >0.6



HDF post dilution

Avantages :

- meilleure épuration des moyennes toxines pour un volume convectif moindre
- objectif de volume convectif/ mortalité

Inconvénients :

- coagulation
- pertes vitamine ? nutriments ? albumine ?

HDF pré dilution

Avantages :

- moins de coagulation (mais dépend du volume convectif)
- moins de perte d'albumine
- myélome

Inconvénients :

- moindre épuration des moyennes molécules/post-dilution
- volume convectif plus élevé
- objectif de volume convectif/ mortalité ?

HDx



HD

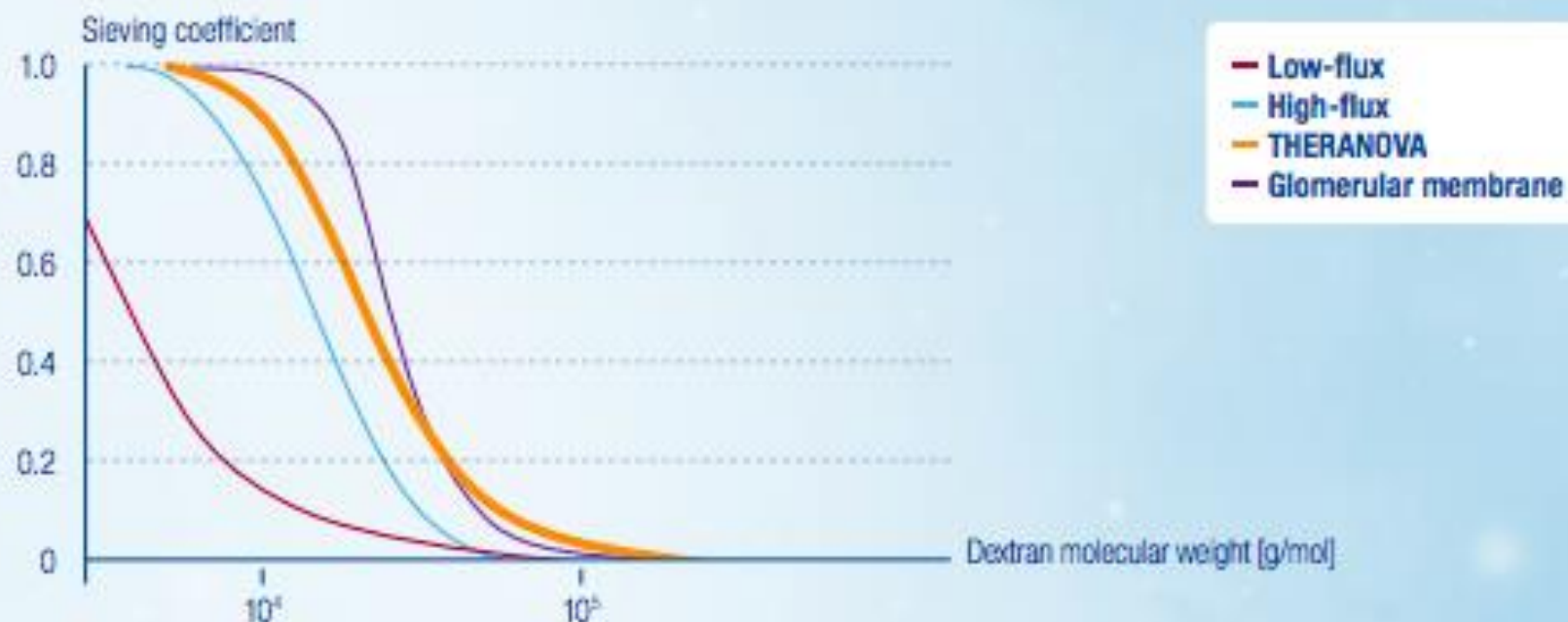


HDF



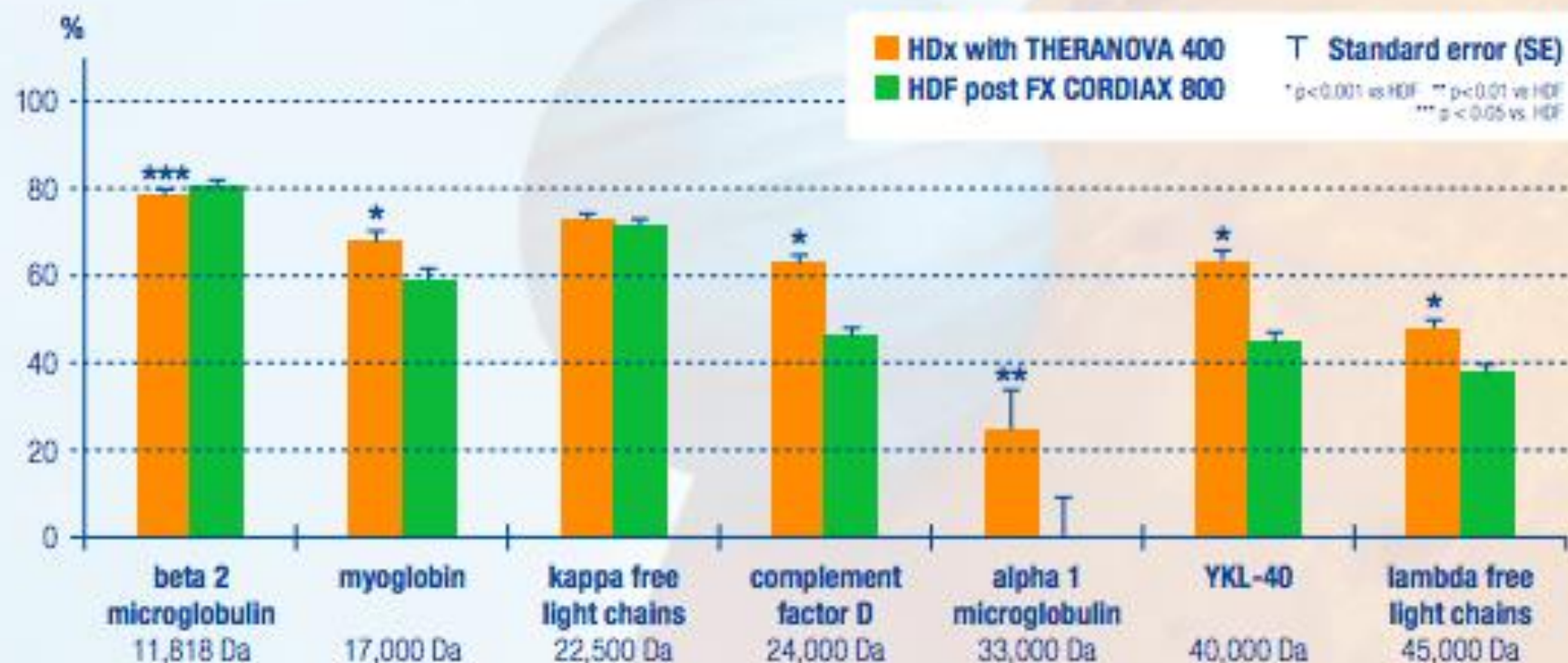
HDx ??????





A STEP CLOSER TO THE NATURAL KIDNEY

By expanding the range of solutes removed in dialysis, while retaining selectivity towards albumin and other essential proteins, the THERANOVA dialyzer is coming a step closer to the natural kidney.



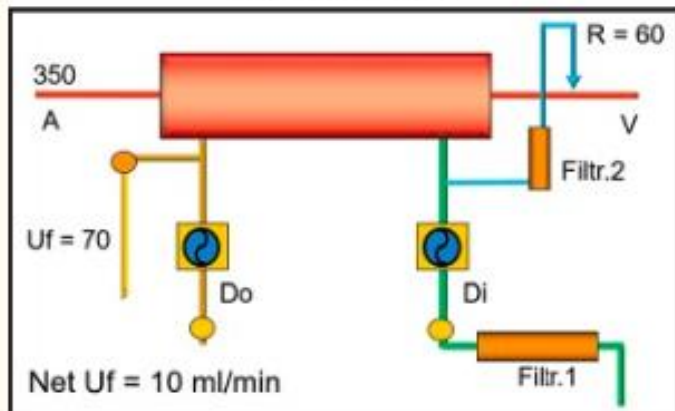
REDUCTION RATIO HDx VS. HDF

HDx with Theranova 400 dialyzer HDF with latest generation high-flux dialyzer for HDF

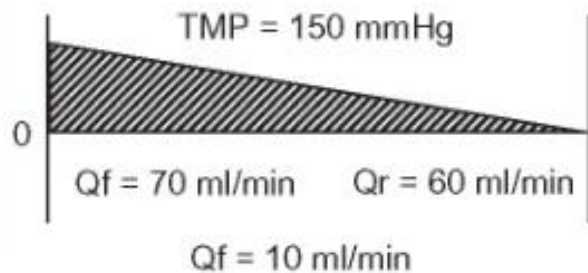
Qb = 400 ml/min – Treatment Time = 4.4 h – Vconv = 24L (Mean) – n = 20

HDF

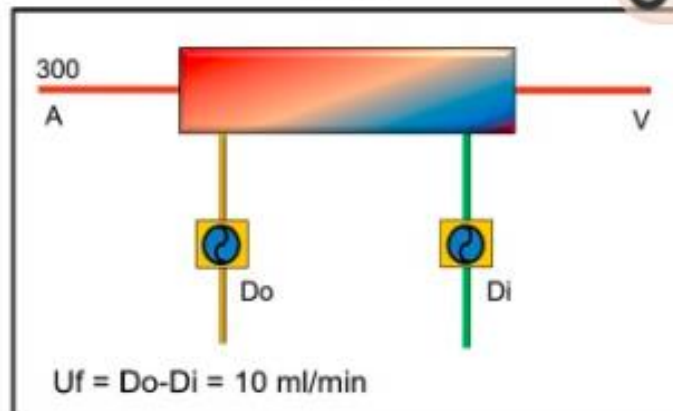
On-Line HDF



Replacement Needed



HDx



No Replacement

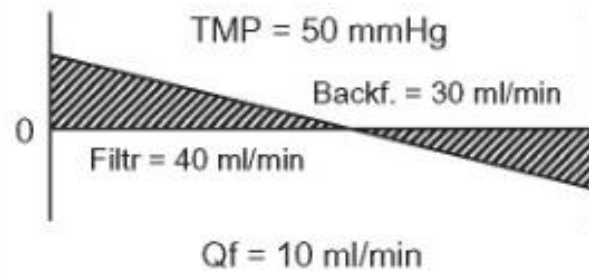


Fig. 3

Etudes cliniques en attente...

Et sinon que faire si la dialyse est inadéquate ?



Mme D.. 65 ans

Observante mais PPID élevées régulières (> 4 L)

Bio : Ph 1.8 mmol/l, Bicar 18 mmol/l K+ 5.6 mmol/l

ETT : HVG

HDF 4 heures

Rappel de l'observance

Avis diététicienne +++

DIALYSE QUOTIDIENNE

En centre

A domicile

Effets + :

TA meilleure, diminution de l'HVG

Baisse du phosphore et chélateurs

Qualité de vie +

Effets - : abord vasculaire ?

DIALYSE LONGUE

Nocturne ++

Effets + :

UF horaire moindre

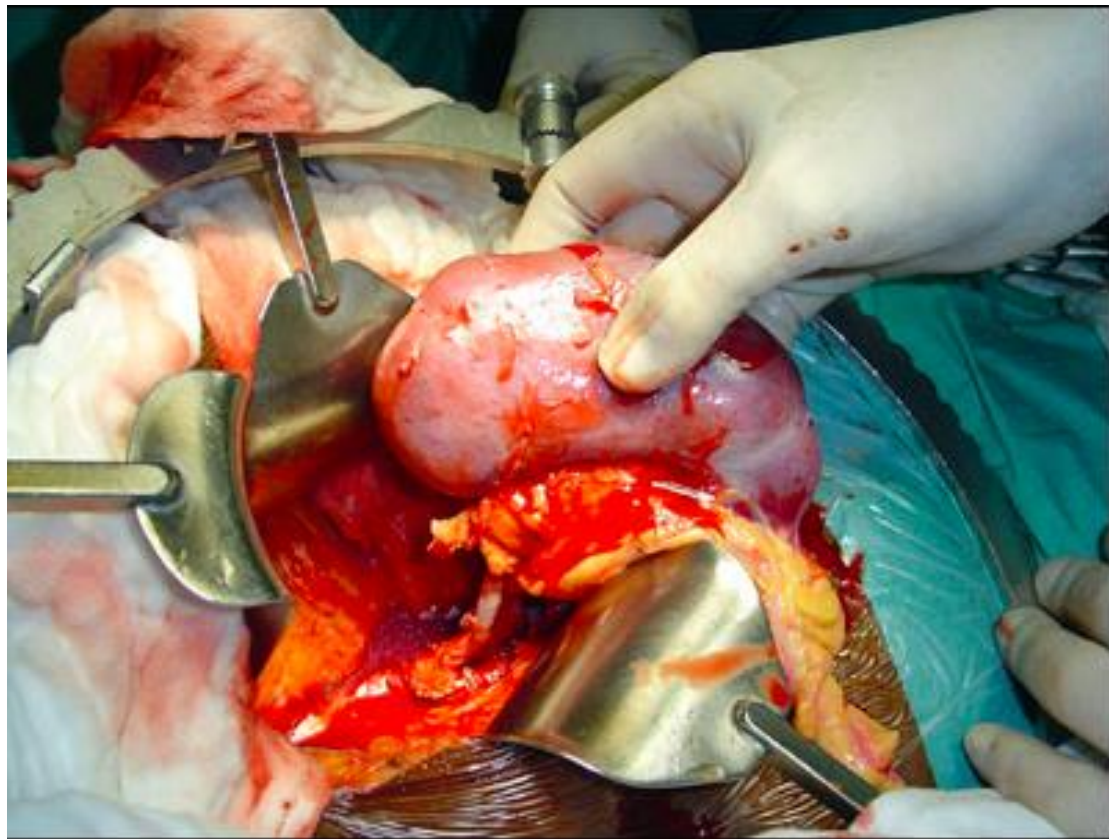
Meilleure épuration

Baisse du phosphate++

GREFFE

TOUJOURS ++

sauf contre indication



Qualité de vie et satisfaction

Ce qui compte le plus pour le patient +++



Dépression, troubles du sommeil, isolement social, hospitalisation....

Si on y pense, ils sont 12 heures par semaine avec vous !

624 heures par an !!

Ils passent plus de temps avec nous qu'avec certains proches !

