

# **From Peritoneal Dialysis to Hemodialysis How could we improve the transition ?**

**Th Lobbedez**

**CHU de Caen**

**Self Dialysis Meeting**

**22 May 2014**

# Deux grands principes concernant la DP

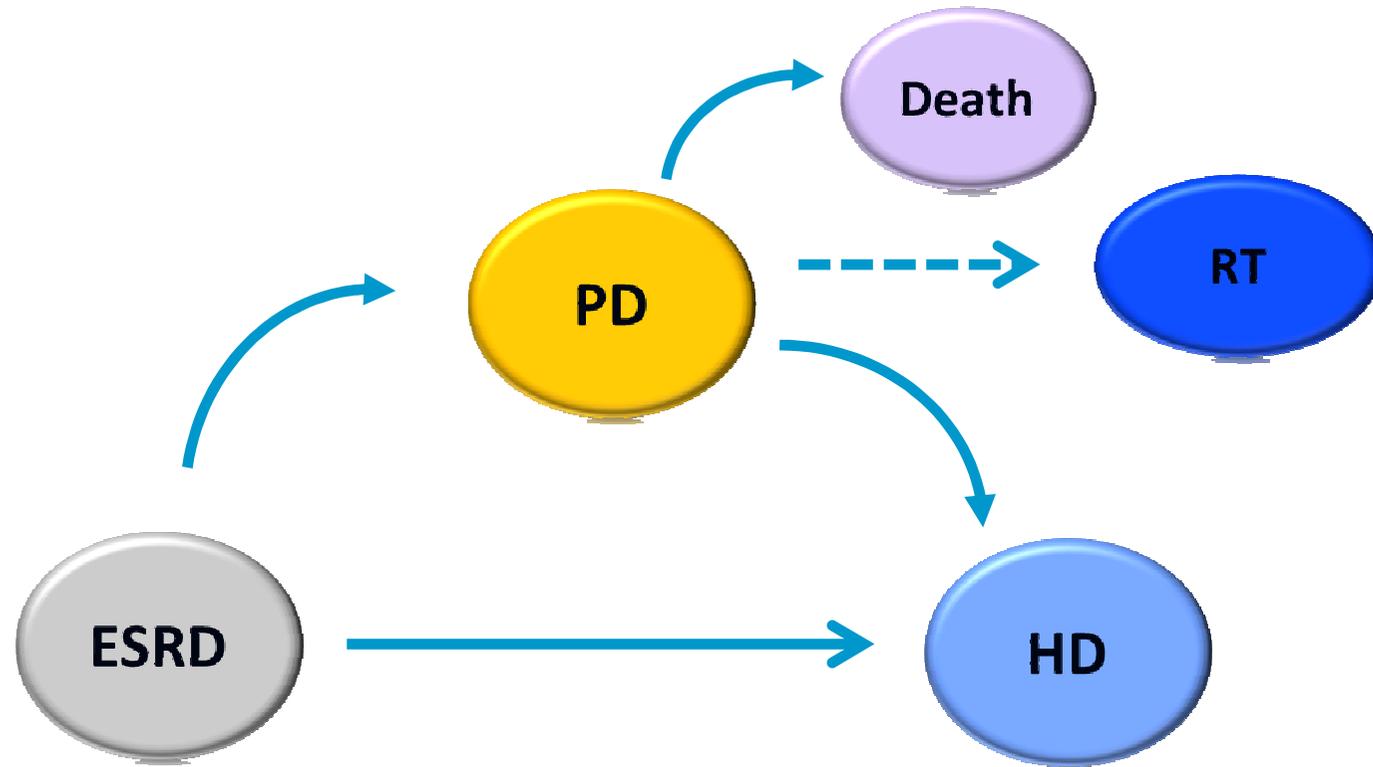
- **“La dialyse péritonéale doit être considérée comme une méthode de traitement de première intention”**

[Pr J-Ph Ryckelynck, Réunion régionale de dialyse ,1993]

- **“La dialyse péritonéale en première intention c’est bien mais il faut pouvoir en sortir”**

[Pr Michel Godin, Réunion Régionale, 1993]

## PD: a temporary period within the trajectory

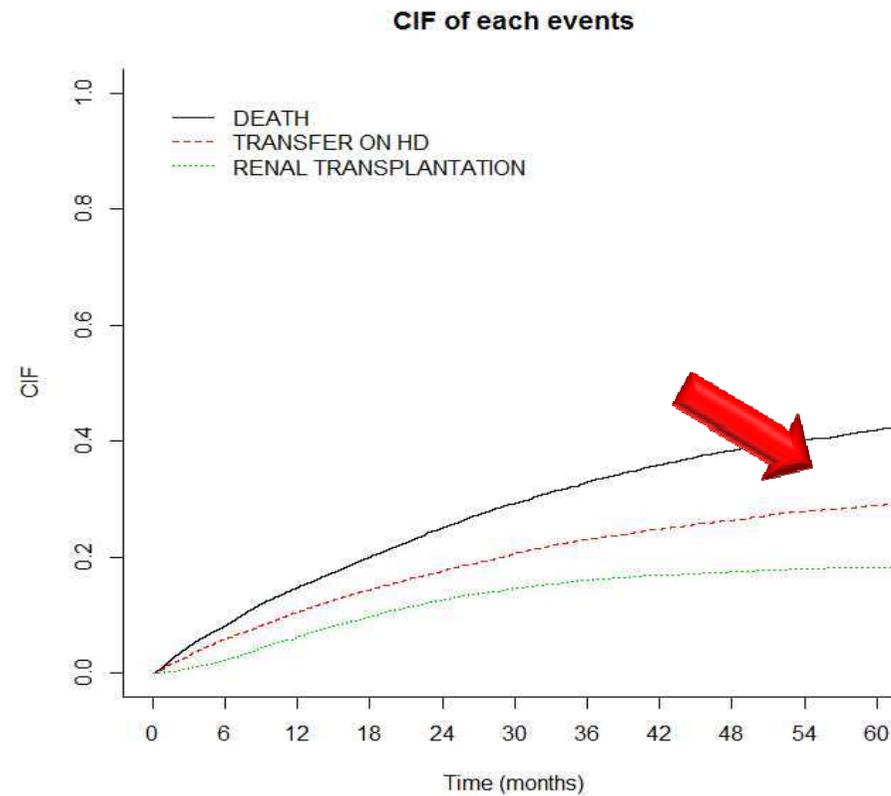


The transfer to HD should be considered for every patients entering on peritoneal dialysis



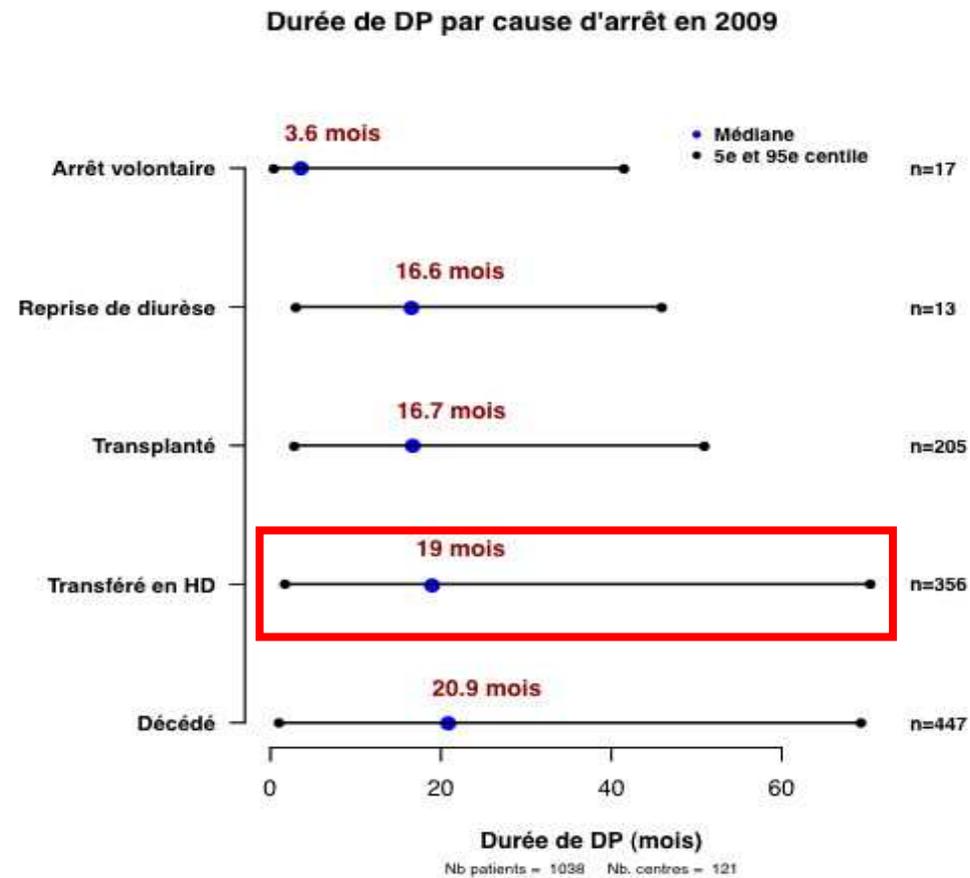
# Transfer to Hemodialysis in France

Cumulative incidence of each outcome on PD  
[n=9840 patients, data from the RDPLF]



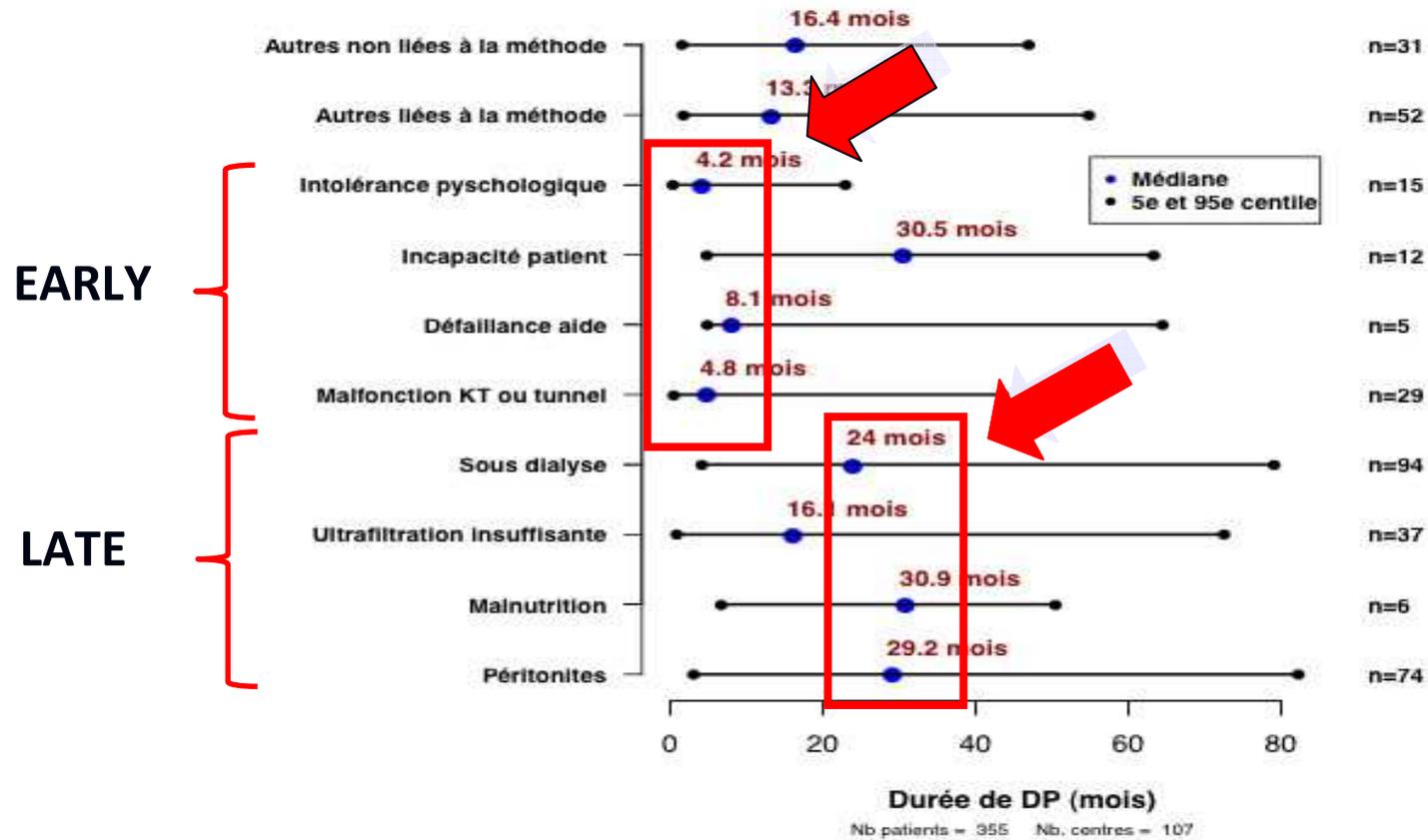
# Peritoneal dialysis duration in France

## Data from the RDPLF



# Causes of Peritoneal Dialysis cessation

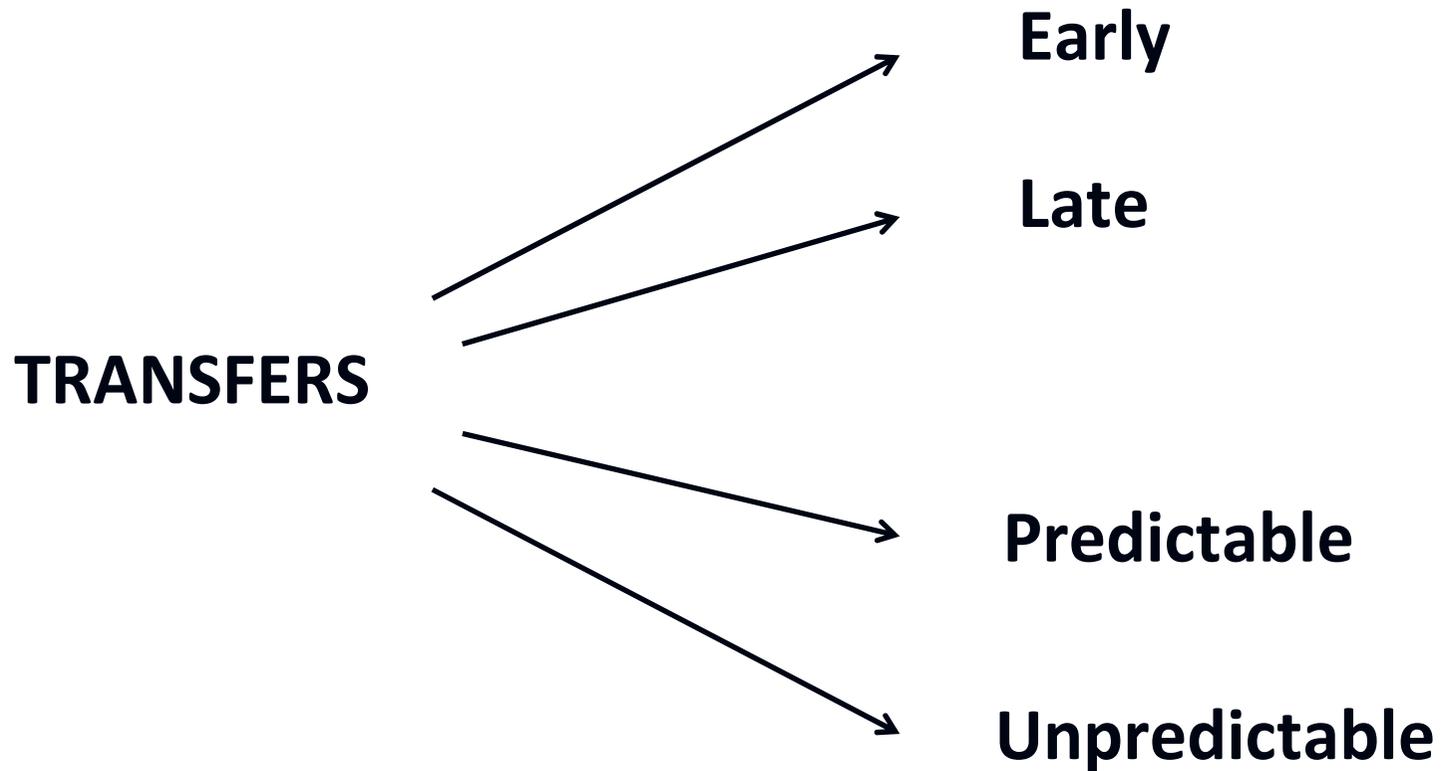
Durée de DP par cause de transfert en HD en 2009



EARLY

LATE

# Type of transfer to hemodialysis



# A preemptive transfer on HD is not recommended

Int Urol Nephrol (2009) 41:903–907

DOI 10.1007/s11255-009-9661-7

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NEPHROLOGY - EDITORIAL

## **No need for an “expiry date” in chronic peritoneal dialysis to prevent encapsulating peritoneal sclerosis**

Guido Garosi • Dimitrios G. Oreopoulos

# How could we improve the transition ?

## 1. Criteria for the transfer to HD

RECOMMANDATIONS PROFESSIONNELLES

Indications et non-indications  
de la dialyse péritonéale chronique  
chez l'adulte

Consensus formalisé

Recommandations

Juin 2007

# Transfer to HD: French recommendations

- Dialysis adequacy
- Peritonitis
- Abdominal wall complications
- Catheter dysfunction
- Metabolic
- Miscellaneous

[disponible sur [www.has-sante.fr](http://www.has-sante.fr)]

# Transfer to hemodialysis for adequacy

## International overview on dialysis adequacy

	<b>Kt/V<sub>urea</sub> (per week) Renal + peritoneal</b>	<b>C<sub>cr</sub> (per week) Renal+ peritoneal</b>
European Best Practice Guidelines 2005 <sup>6</sup>	≥ 1.7	APD >45 L/wk for patients with frequent short exchanges and slow transport status
KDOQI (US) 2006 <sup>3</sup>	≥ 1.7	N/A
ISPD 2006 <sup>5</sup>	≥ 1.7	APD > 45 L/Wk
Canadian Society of Nephrology 1999 <sup>4</sup>	≥ 1.7	N/A
CARI (Australia) 2005 <sup>8</sup>	≥ 1.6	High/high average transport > 60 L/Wk Low/low average transport > 50 L/wk
UK Renal Association 2007 <sup>7</sup>	≥ 1.7	≥ 50 L/wk
Spanish Soc of Neph Guidelines, Nefrología, 2006	≥ 1.7	wCrCl is 50L/w/1.73m <sup>2</sup> in CAPD; 45 in APD low transporters

# How to define dialysis adequacy ?

- Adequacy is estimated with small solute clearance
- APD is not similar to CAPD in terms of adequacy
- Residual renal function is a major contributor

- Patients with uremic syndrome despite a good Kt/V
- Patients are doing well with bad Kt/V
- Kt/V alone is not a good criteria for the transfer on HD

# Ultrafiltration and sodium clearance

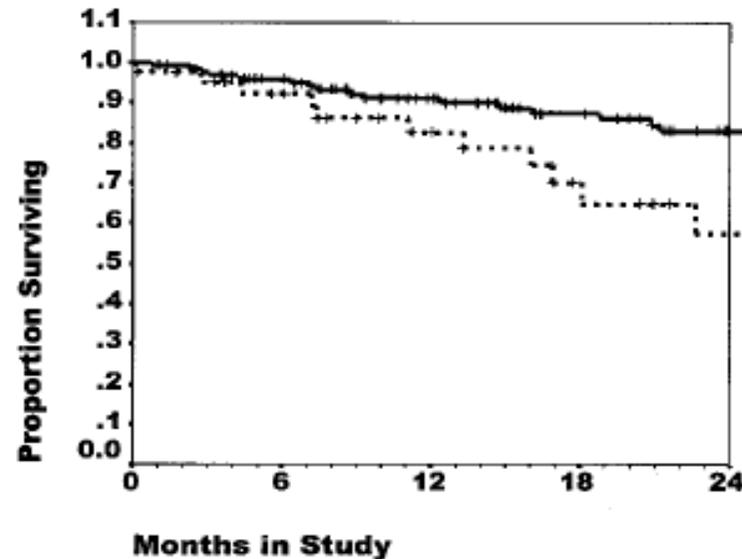
## The Ates observational study

[Ates, Kidney Int 2001; 60:767-776]

Variables	HR [95%CI]
Comorbidites	1,65 (1,19-1,61)
Créatinine	0,69 (0,55-0,87)
Fonction rénale	0,53 (0,31-0,91)
Extraction sodée (10 mmol/j/1,73m)	0,90 (0,84-0,96)

## The EAPOS observational study

[Brown EA, JASN 2003;14:2948-57]



- **UF > 750 ml/j in anuric patient**
- **UF > 250 in case of residual renal function**
- **To avoid negative UF**

[Canadian Society of Nephrology Guidelines and Recommendations 2011]

# Peritonitis and transfer to hemodialysis

- More than 3 enteric peritonitis
- Recurrent peritonitis despite a new catheter
- Multiple peritonitis without explanation
- Fungal peritonitis

[Recommandations HAS 2009]

**Refractory peritonitis and relapse linked to catheter biofilm should not be considered as a cause of definitive transfer to HD**

# Enteric peritonitis: a greater risk of transfer to HD

## Data from the ANZDATA registry

Outcome	Pure enterococcal peritonitis (n = 64 episodes)	Polymicrobial enterococcal peritonitis (n = 52 episodes)	Non-enterococcal peritonitis (n = 3478 episodes)	P value
<b>Treatment</b>				
Change to second antibiotic regimen	38 (59%)	44 (85%)	1928 (55%)	<0.001
Time to second antibiotic regimen	3 [2–5.25]	3 [2–5]	3 [2–5]	0.4
Change to 3 <sup>rd</sup> antibiotic regimen	4 (6%)	20 (38%)	473 (13%)	<0.001
Time to third antibiotic regimen	7 [4.25–12.75]	6 [5–14]	6 [4–10]	0.5
Total antibiotic treatment duration	12 [7–18.75]	15.5 [12–28.75]	14 [8–20]	0.008
Uncomplicated by relapse, catheter removal or death	38 (59%)	21 (40%)	237 (68%)	<0.001
Peritonitis relapse	14 (22%)	3 (6%)	485 (14%)	0.04
<b>Hospitalization</b>				
Number (%)	48 (75%)	43 (83%)	2413 (69%)	0.08
Duration	4.5 [2.25–11.75]	13 [7–29]	6 [3–12]	<0.001
<b>Catheter removal</b>				
Number (%)	16 (25%)	27 (52%)	732 (21%)	<0.001
Time to occurrence	8 [5–16.75]	6 [3–10]	6 [3–13]	0.4
<b>Temporary haemodialysis</b>				
Number (%)	5 (8%)	2 (4%)	145 (4%)	0.4
Time to occurrence	6 [3.25–6]	5 [5–5]	6 [3–12]	0.9
Duration	26.5 [1–66.25]	77 [3–151]	68 [27–104]	0.2
<b>Permanent haemodialysis</b>				
Number (%)	11 (17%)	26 (50%)	598 (17%)	<0.001
Time to occurrence	12 [8–17]	6[4–11]	7 [4–13]	0.2
<b>Death</b>				
Number (%)	1 (1.6%)	3 (5.8%)	78 (2.2%)	0.2
Time to death	6 [6–6]	9 [1–15]	13 [3.5–24.5]	0.7

[M Edey, Nephrol Dial Transplant 2010; 25:1272-1278]

# Metabolic complication and transfer to HD

- **Massive weigh gain on PD (> 15 % over one year)**
- **Triglyceride > 10 g/l**
- **Malnutrition without any explanation**

[Recommandations HAS 2009]

**How could we improve the transition ?**

**2. From home therapy to home therapy**

# From PD to Home hemodialysis ?

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## **TRANSITIONS FROM PD ARE EXPECTED. WHY NOT CONTINUE AT HOME?**

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## **THE USE OF NOCTURNAL HOME HEMODIALYSIS AS SALVAGE THERAPY FOR PATIENTS EXPERIENCING PERITONEAL DIALYSIS FAILURE**

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Fatima Benjamin-Wong,<sup>3</sup> and Christopher T. Chan<sup>3</sup>

## Peritoneal Dialysis cyclers



## Home Hemodialysis



**It looks great, but in this case transfer to HD must be a gradual process...**

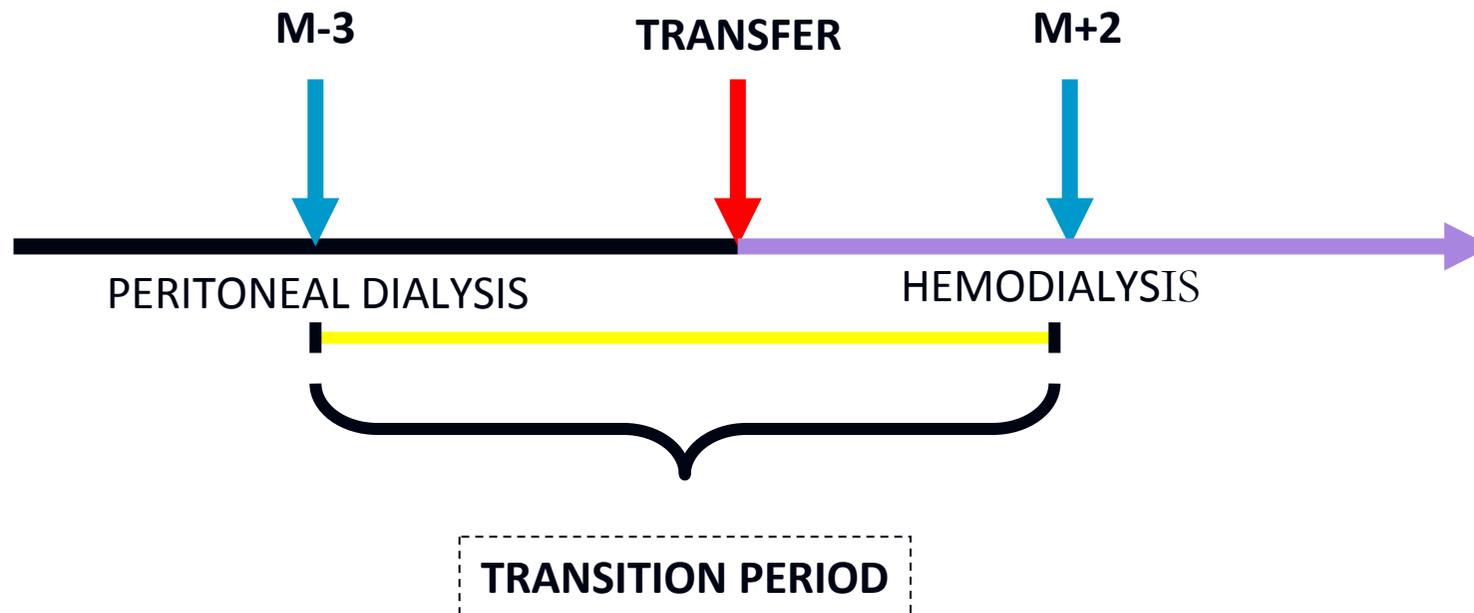
**IS TRANSITION BETWEEN PERITONEAL DIALYSIS AND HEMODIALYSIS  
REALLY A GRADUAL PROCESS?**

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Lucie Boissinot,<sup>1</sup> Isabelle Landru,<sup>2</sup> Eric Cardineau,<sup>3</sup> Elie Zagdoun,<sup>4</sup> Jean-Philippe Ryckelycnk,<sup>1</sup>  
and Thierry Lobbedez<sup>1</sup>

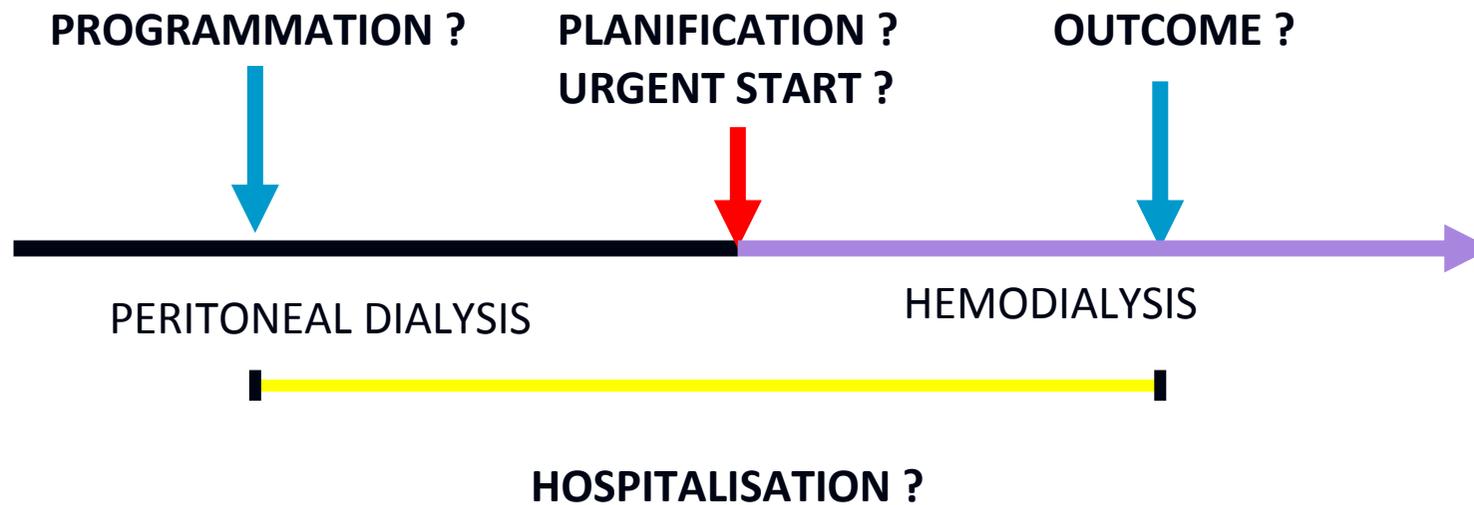
*Nephrology Department,<sup>1</sup> CHU Clemenceau, Caen; Nephrology Department,<sup>2</sup> CH Bisson, Lisieux; Nephrology  
Department,<sup>3</sup> CH Intercommunal, Alençon; and Nephrology Department,<sup>4</sup> CH Memorial, Saint Lo, France*

# Definition of the transition period



- **M-3: time for the maturation of the vascular access**
- **M+2: time which remains attributed to the previous modality**
- **Time[(M-3)-(M+2)]: transition period**

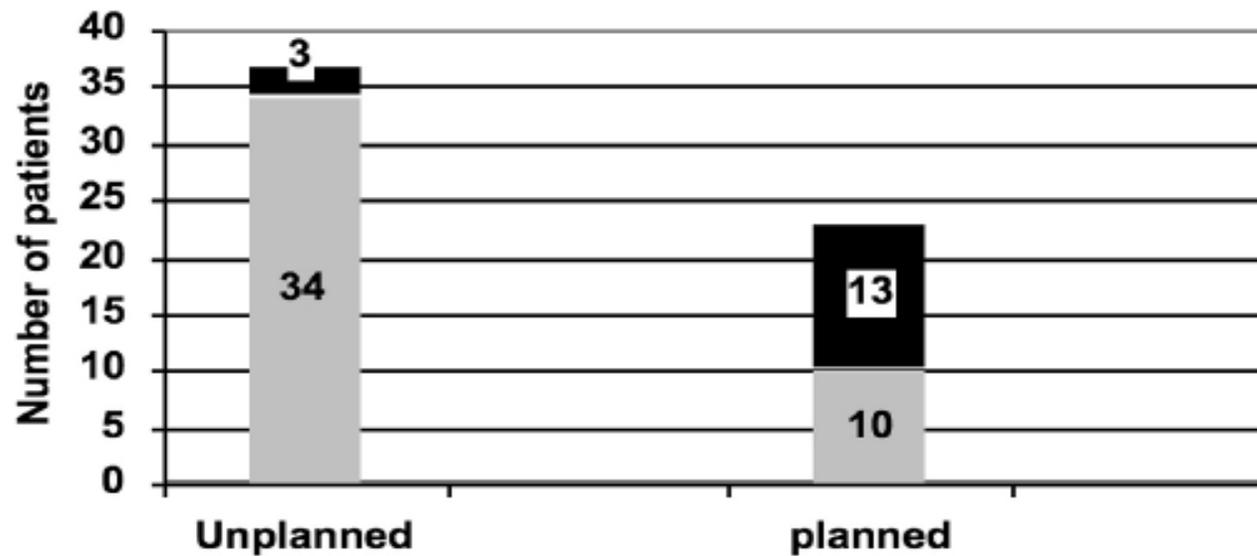
## Definition of the events during the transition period



- **Unplanned transfer: through an HD catheter**
- **Urgent start on HD: acidosis, hyperkalemia, fluid overload**

# Is transition really a gradual process ?

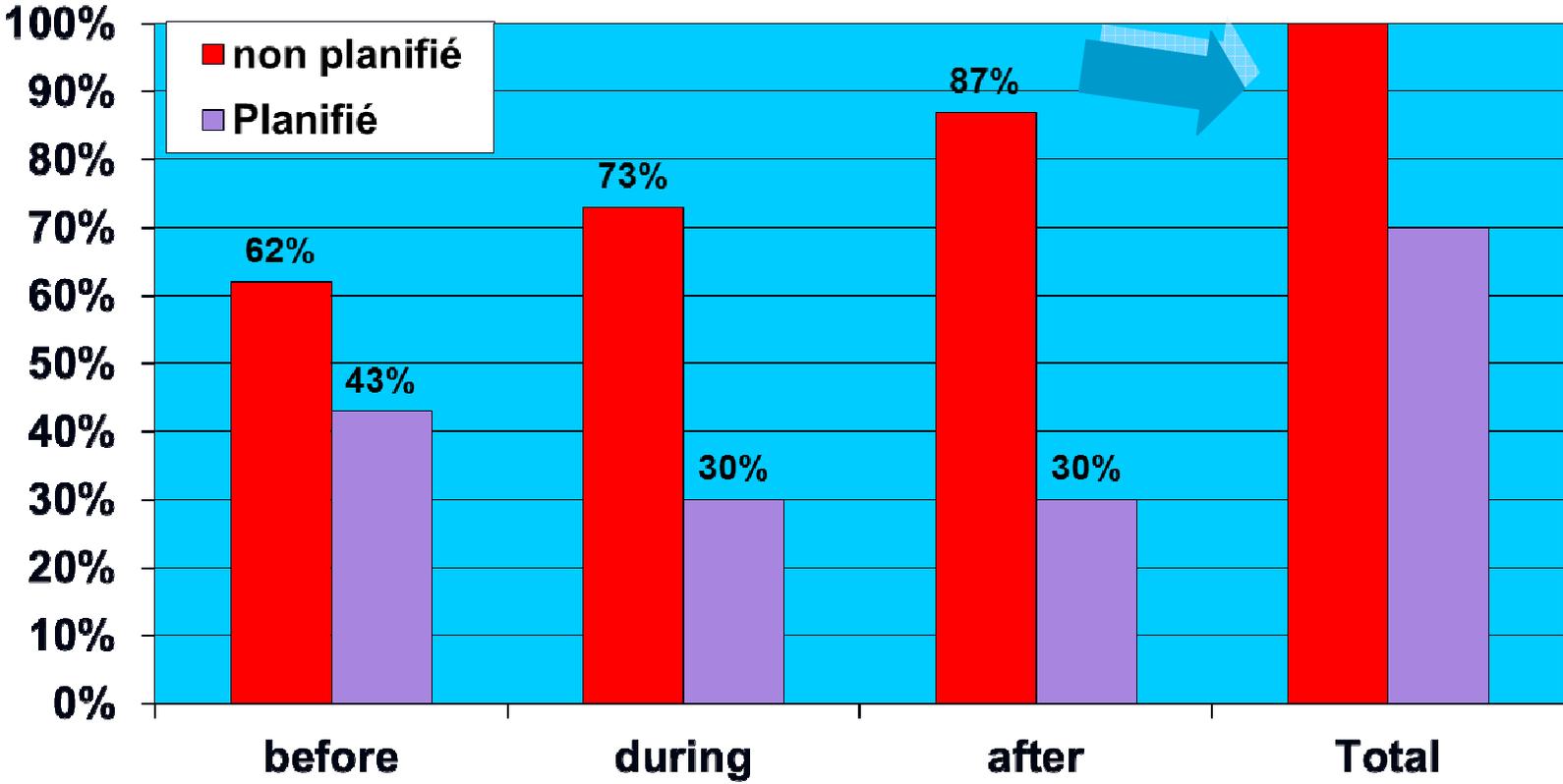
Unplanned start among the patients transferred to HD



[L Boissinot, Perit Dial Int, Epub in advance]

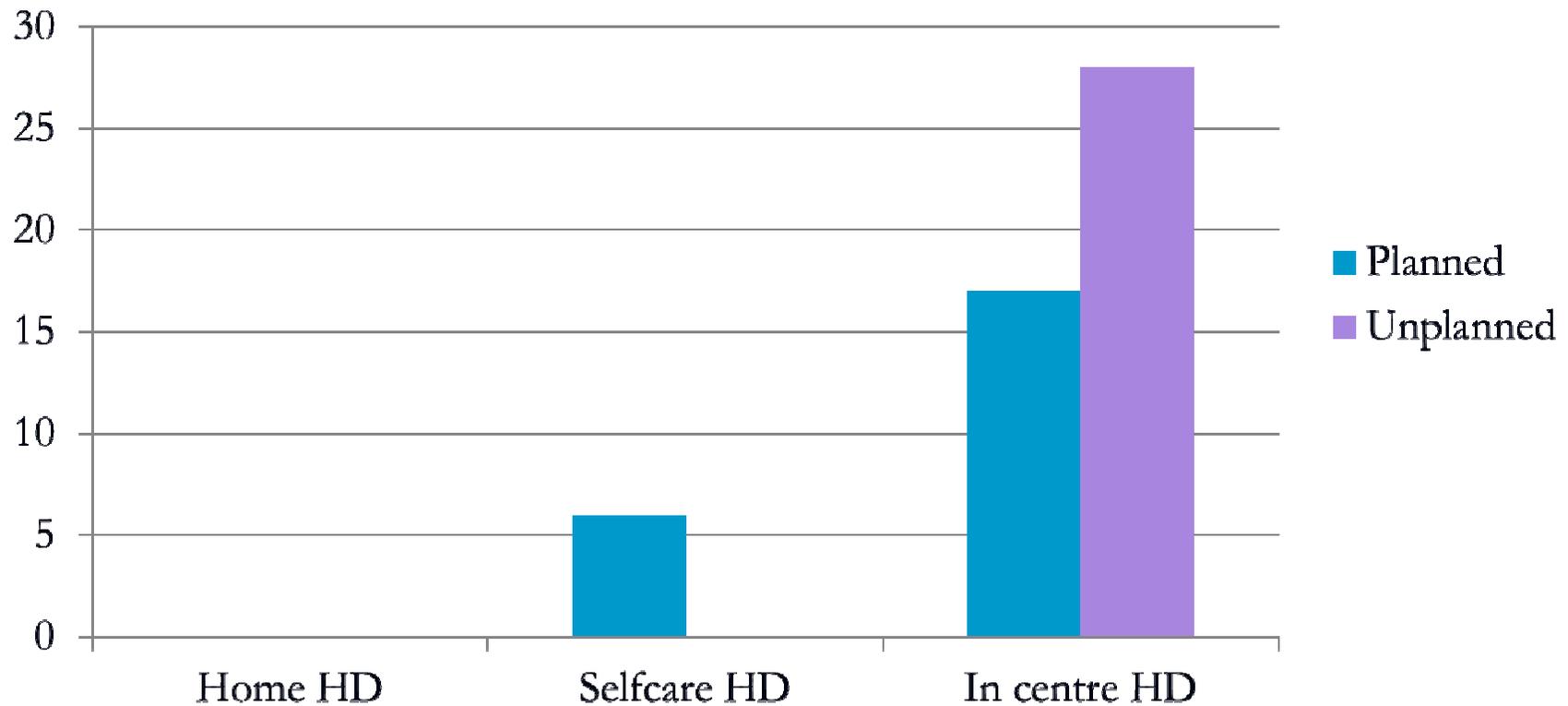
# Impact of the transfer on hemodialysis

## Hospitalization during the transition



# Outcome on hemodialysis after transfer

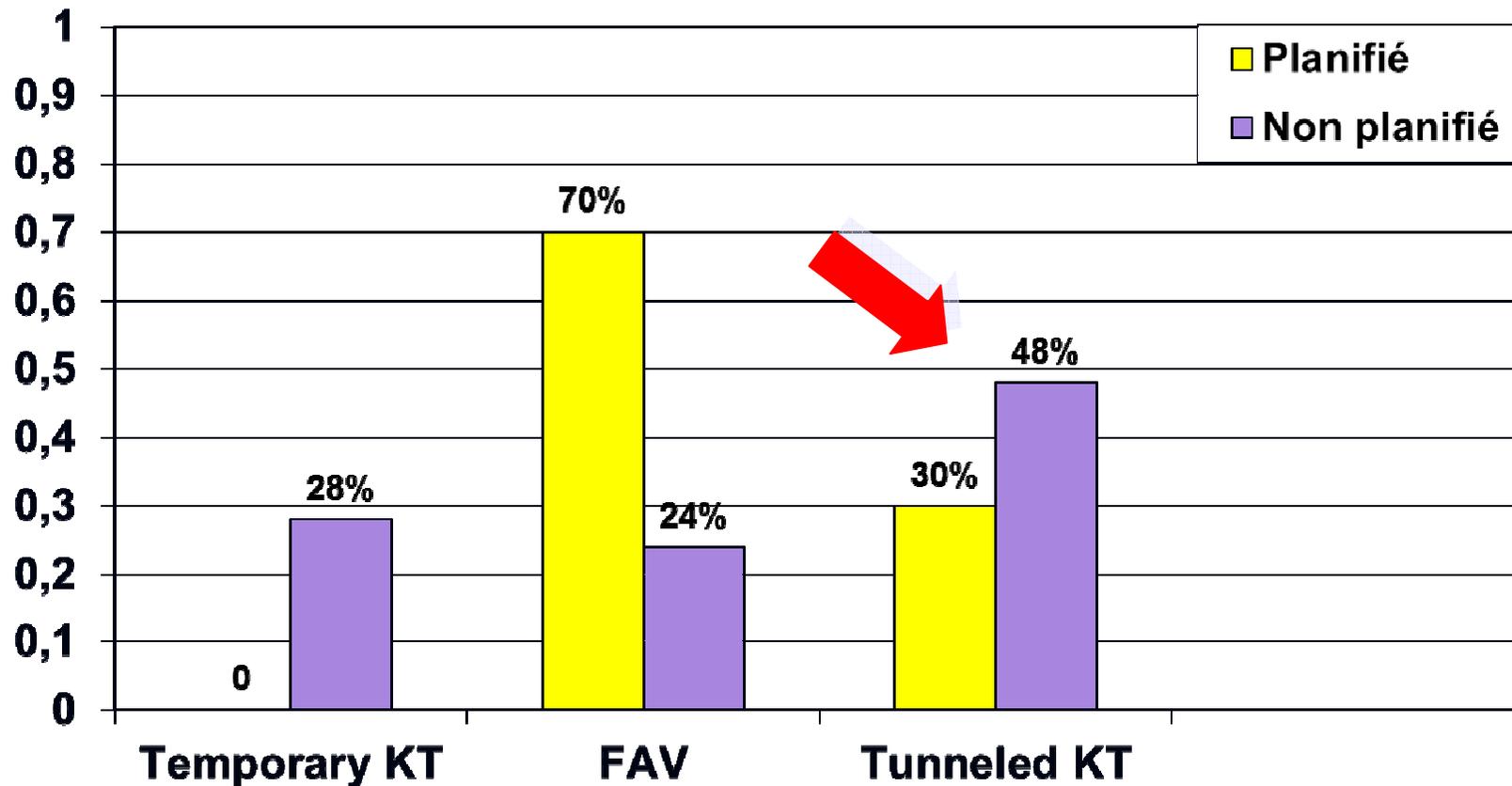
## Hemodialysis facility two months after the switch



[L Boissinot, Perit Dial Int]

# Vascular access after the transfer on HD

## Vascular access after the transition



# Risk factor of the unplanned transition

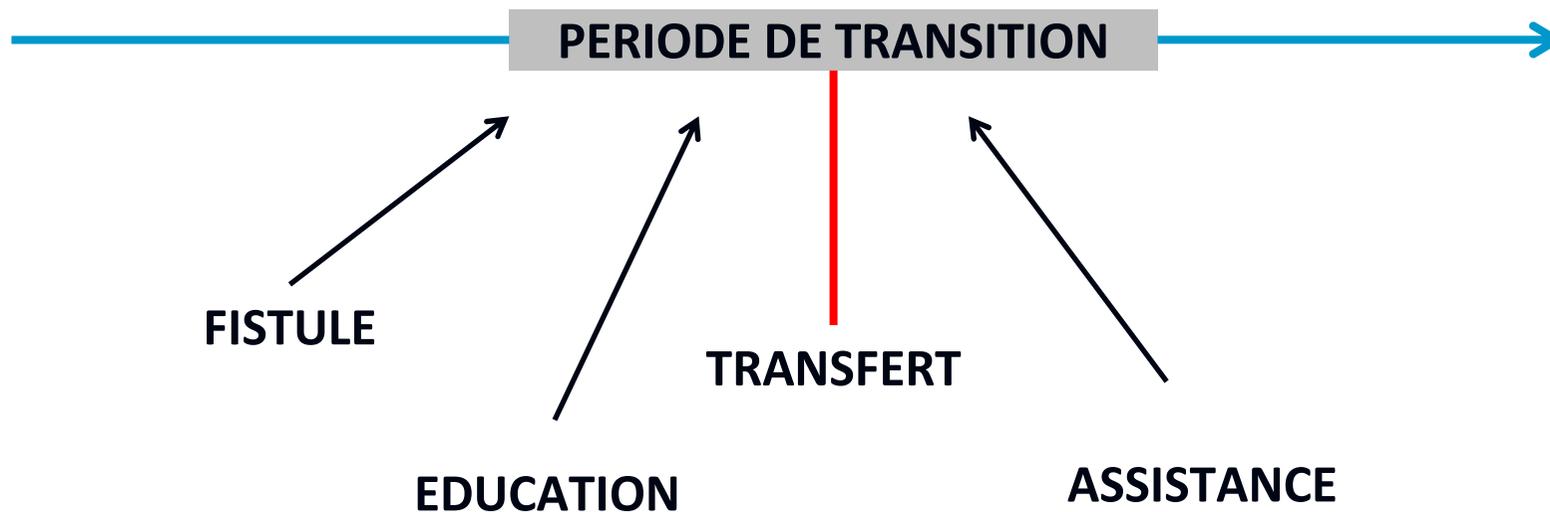
## Multivariate analysis for the unplanned HD initiation

<b>Covariate</b>	<b>Odds Ratio</b>	<b>95% CI</b>
Charlson index (unit)	1.05	0.99-1.12
Peritonitis (more than one episode)	1.46	1.11-1.93
PD duration (months)	0.99	0.98-1.00

[L Boissinot, Perit Dial Int, Epub in advance]

# Could we improve the transfer on hemodialysis

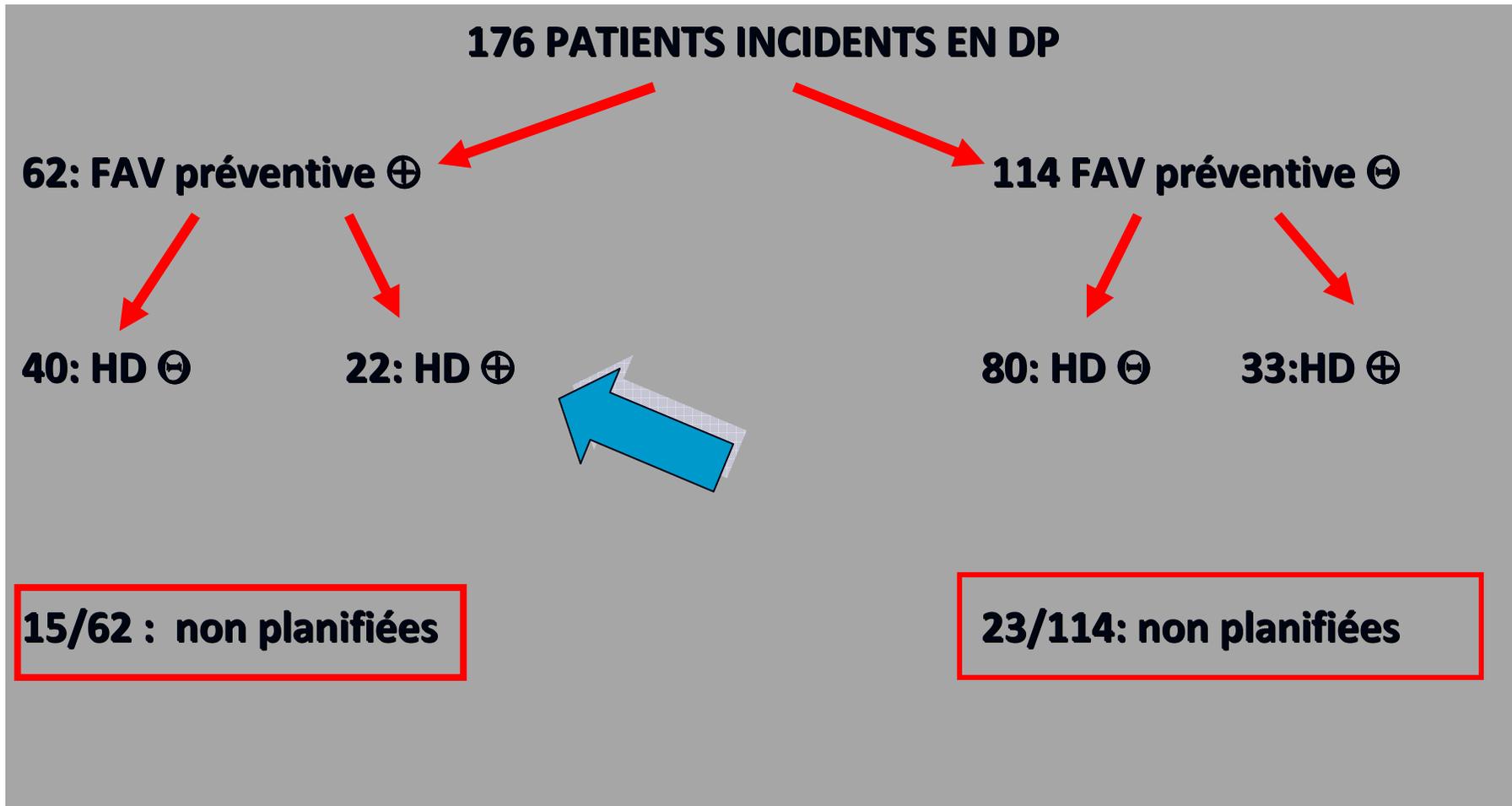
Transition is a period of time rather than a single point



**How could we improve the transition ?**

**3. To create a vascular access in advance**

# A preemptive vascular access is not mandatory but...is it still true in 2014 ?



[IJ Beckingham, Lancet 1993; 341: 1384-86]

## How could we improve the transition

- Identifying those patients who are exposed to EARLY peritoneal dialysis FAILURE
- In an attempt to create a VASCULAR ACCESS for hemodialysis earlier

# Early peritoneal dialysis failure in France

*Original Article*



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## Early failure in patients starting peritoneal dialysis: a competing risks approach

Clémence Béchade<sup>1</sup>,  
Lydia Guittet<sup>2</sup>,  
David Evans<sup>3,4,5</sup>,  
Christian Verger<sup>3</sup>,  
Jean-Philippe Ryckelynck<sup>1</sup>  
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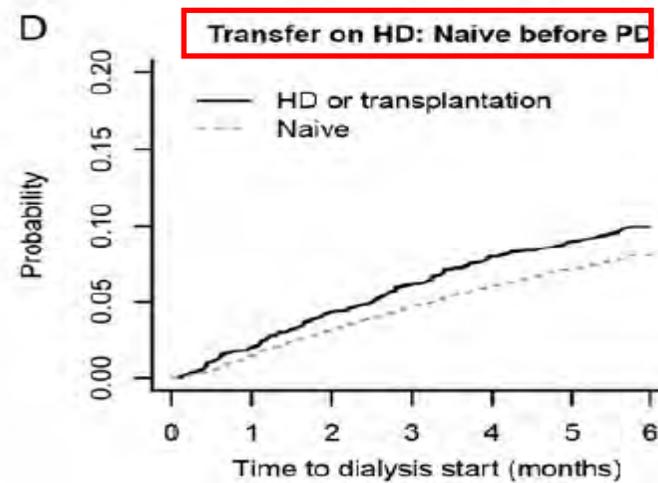
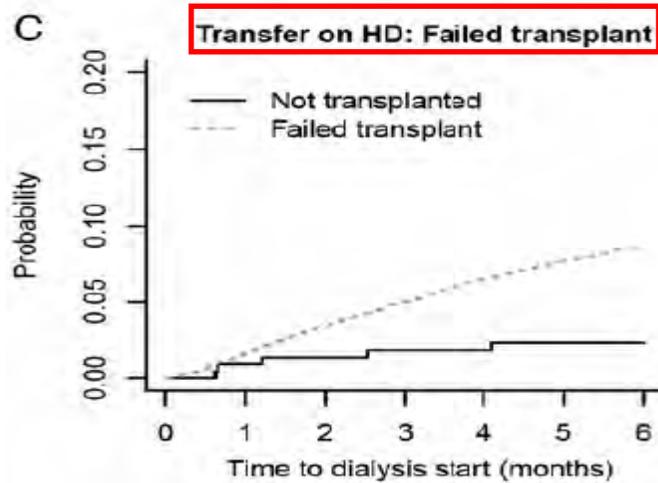
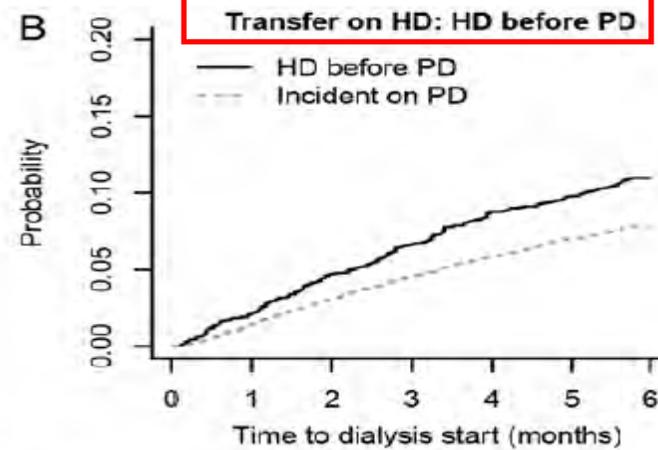
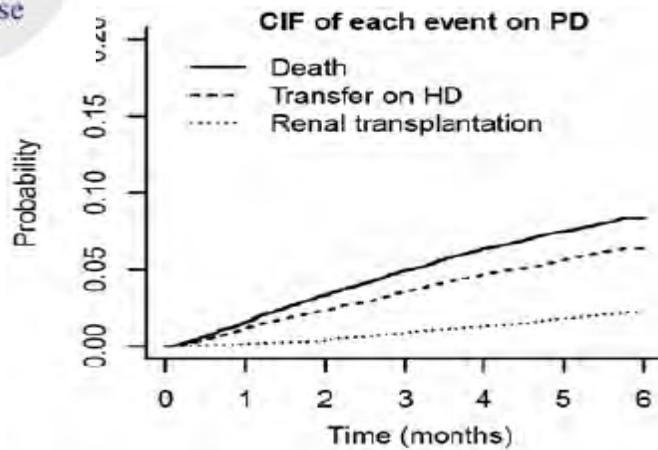
<sup>3</sup>RDPLF, 30 rue Sere Depoin, Pontoise, France,

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# Risks factor of early PD failure



[C Bechade, Nephrol Dial Transplant 2013]

# Risks factor of the early PD failure

## Multivariate analysis [Fine and Gray model]

Covariate	Transfer to HD	
	sd-RH	95% IC
Age (5years)	0.95	0.92-0.98
Modified CCI	0.96	0.90-1.00
Sex (male)	0.95	0.81-1.12
Underlying nephropathy		
<b>Therapy before PD initiation</b>		
Transplantation before PD	2.49	1.69-3.68
No treatment before PD	Ref	
<b>Time in HD before PD (mo)</b>		
0	Ref	
≤3	1.43	1.14-1.80
>3	1.96	1.47-2.60
<b>Center size (new pts per yr)</b>		
<10	Ref	
[10-20]	0.81	0.68-0.96
>20	0.75	0.59-0.96
<b>Assisted PD</b>		
Self PD	Ref	
Family	0.72	0.53-0.98
Nurse	0.94	0.76-1.16
<b>Patients awaiting renal transplantation</b>	0.10	0.07-0.16
<b>Early peritonitis</b>	2.17	1.30-3.61

## Suggestions ?..

- **Failed transplant, unplanned PD start, and early peritonitis are risk factor of the EARLY PD FAILURE**
- **PREEMPTIVE VASCULAR ACCESS creation should be considerer as an option for those patients**

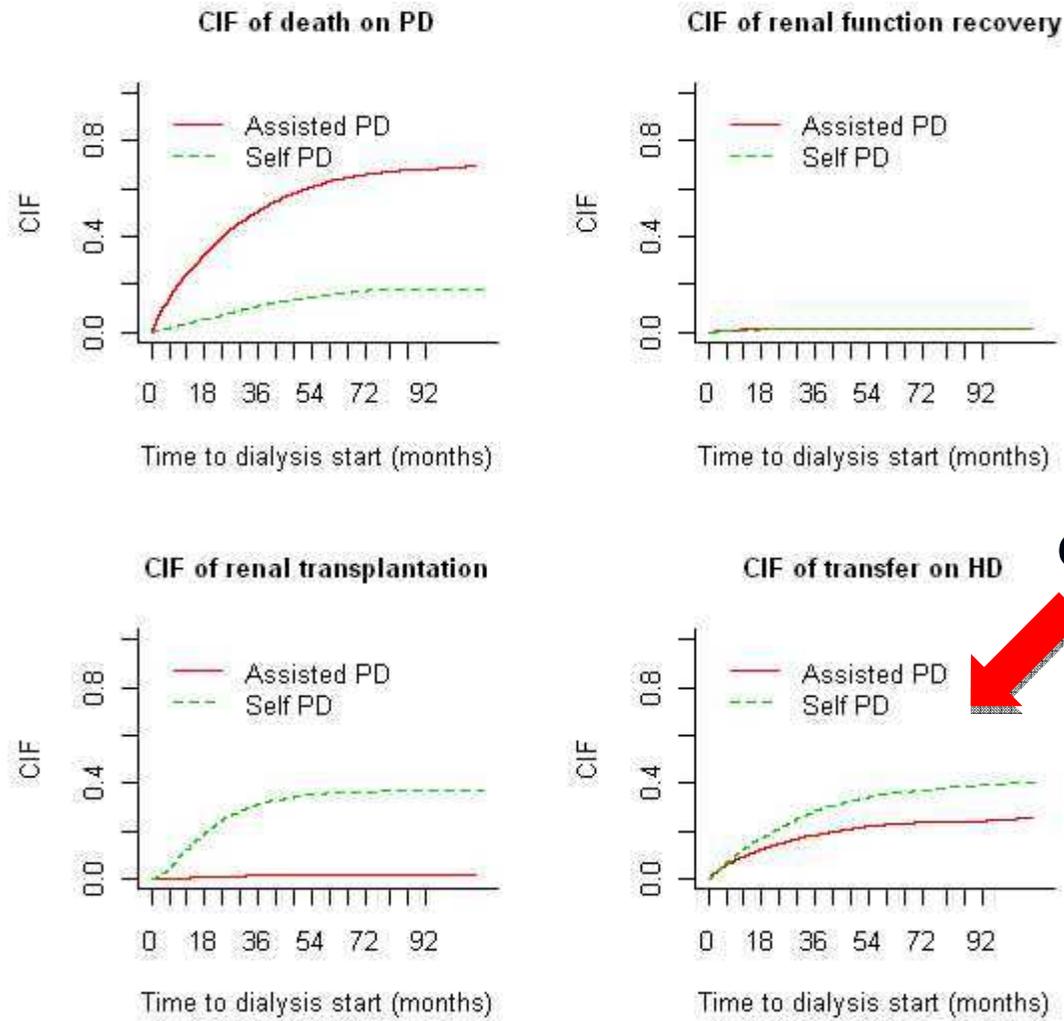
# How could we improve the transition period ?

- **By identifying those patients who will be TRANSFERRED LATELY on hemodialysis**
- **Those patients will be exposed to the complications of Peritoneal Dialysis**
- **These patients should be GOOD CANDIDATE for a transfer on hemodialysis**

## **Factors associated with the late transfer on HD ?**

- **Lack of patients assistance**  
[main outcome=transfer predictable]
- **Probability to receive a kidney transplantation**  
[main outcome= transplantation]
- **The level of comorbidities**  
[main outcome=death]

# Effect of assisted peritoneal dialysis on PD failure



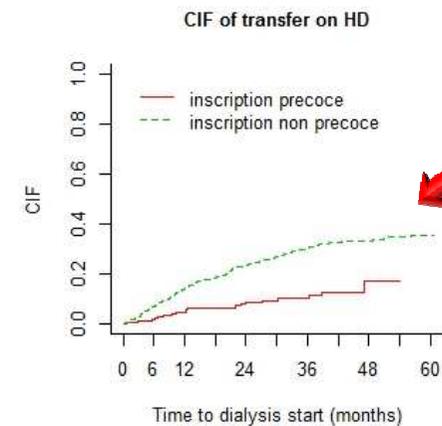
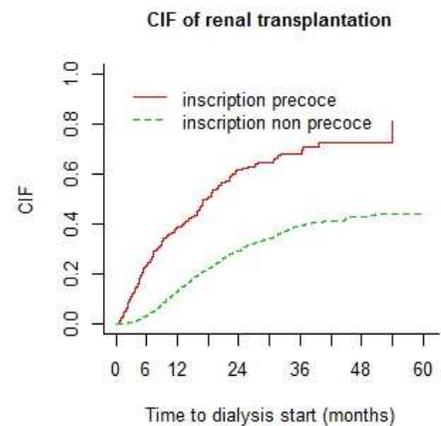
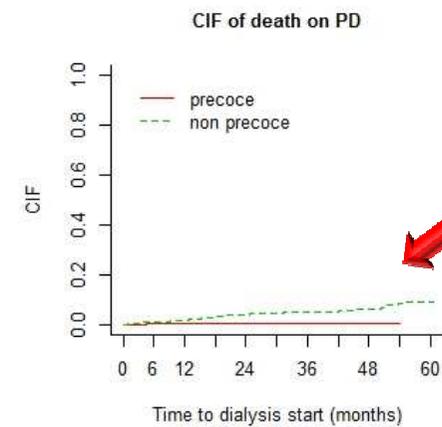
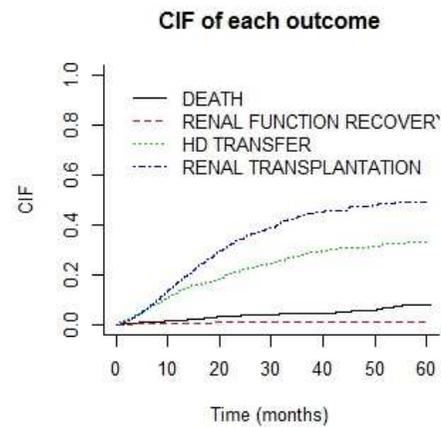
Gray test :  $p < 0.05$



[T Lobbedez, Clin J Am Soc Nephrol 2012;7:612-618]

# Effect of the early registration on the waiting list

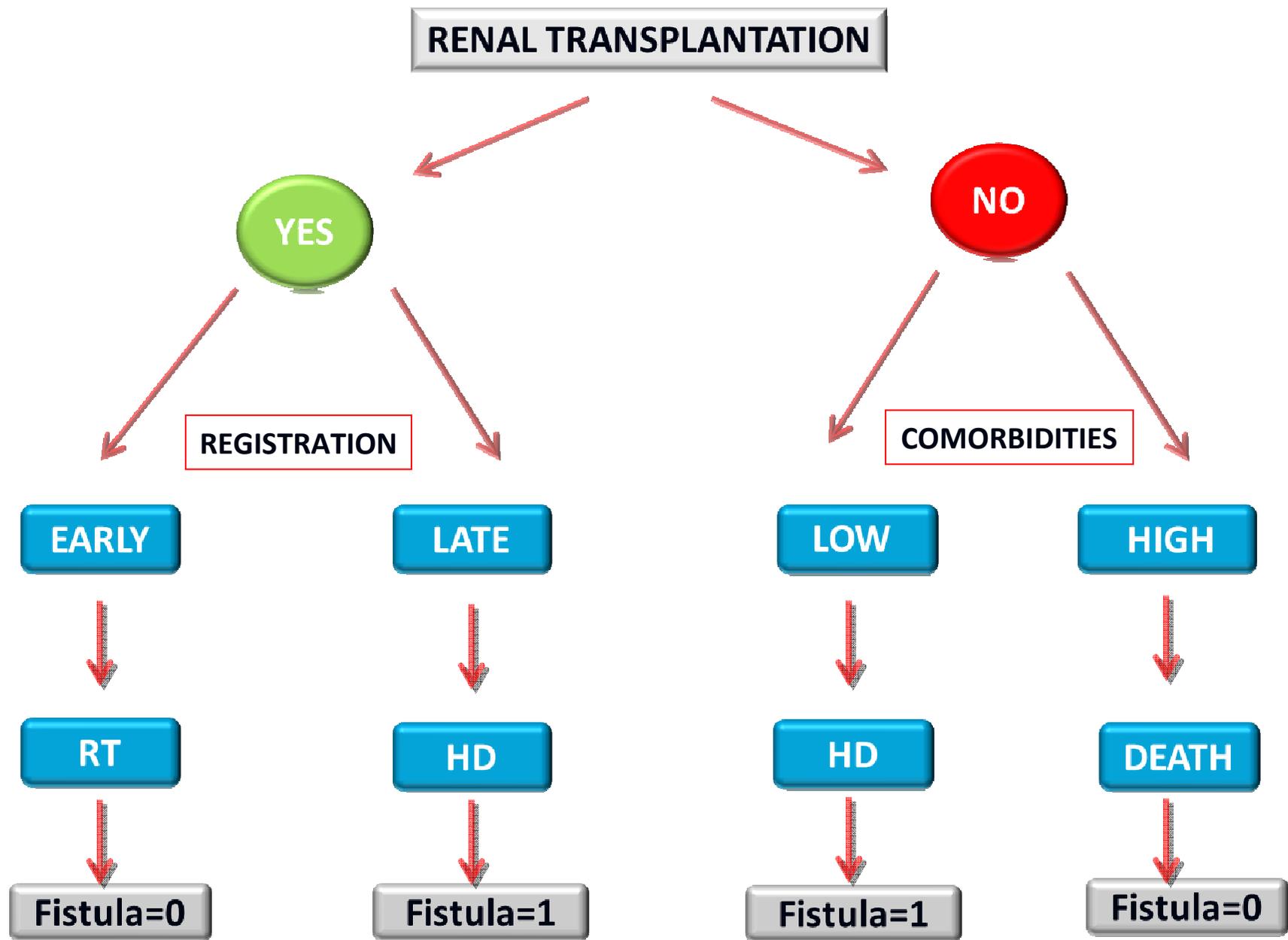
## Cumulative incidence of each outcome on PD



# Effect of the comorbidity on the technique survival

RISK FACTOR	HR [95% CI]	P
GENDER (male)	1.01 [0.78-1.29]	NS
AGE 75-79 80-84 85-89 >90	Ref 0.97 [0.74-1.27] 0.87 [0.60-1.28] 0.31 [0.11-0.83]	NS
PD MODALITY CAPD APD	Ref 1.54 [1.11-2.13]	<0.05
ASSISTANCE Autonomous Family assisted Nurse assisted	Ref 0.86 [0.48-1.54] 0.93 [0.69-1.24]	NS
<b>MODIFIED CCI 2-3 4-5 &gt;6</b>	Ref 0.85 [0.65-1.11] 0.64 [0.44-0.93]	<0.05
CENTRE SIZE < 20 21-30 > 30	Ref 0.75 [0.51-1.12] 0.56 [0.37-0.86]	<0.05

[C Castrale, Nephrol Dial Transplant 2010]



# Transplantation

<b>NO</b> [Cumulative incidence (4 yrs)]	<b>Events on PD</b>	<b>YES</b> [Cumulative incidence (4 yrs)]
53%	Death	6% *
32%	Transfer to HD	24%*
0.1%	Transplantation	45% *

[\*: p value <0.001, Gray's test]

## Charlson Index

<b>&lt; 4</b> [CI at 4 yrs]	<b>Event</b>	<b>&gt; 4</b> [CI at 4 yrs]
26%	Death *	53%
<b>43%</b>	Transfer to HD *	23%
0,1%	Transplantation	0,1%

[\*: p value <0.001, Gray's test]

## Registration

<b>&gt; 3 months</b> [CI at 4 yrs]	<b>Event</b>	<b>&lt; 3 months</b> [CI at 4 yrs]
10%	Death*	1%
<b>46%</b>	Transfer to HD*	16%
23%	Transplantation*	63%

[\*: p value <0.001, Gray's test]

# Effect of the center experience on PD failure

## Multivariate analysis (Fine and Gray)

Covariate	Sd RH (95%CI)
Age (years)	0.99 (0.99-1.00)
Gender (Male)	1.06 (0.97-1.15)
Modified CCI	1.00 (0.99-1.03)
Underlying nephropathy	0.98 (0.96-1.00)
Failed transplant	1.72 (1.39-2.17)
Transferred from HD	1.27 (1.14-1.40)
Early peritonitis	1.45 (1.06-1.97)
<b>Centre size: &gt; 20 pts per year</b>	<b>0.82 (0.72-0.91)</b>
Family assisted PD	0.81 (0.70-0.94)
Nurse assisted PD	0.72 (0.63-0.81)

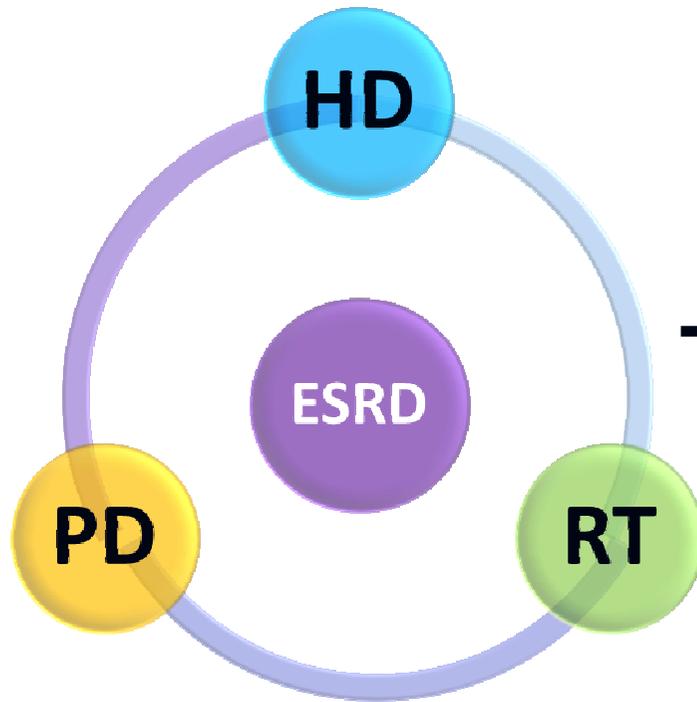
[T Lobbedez, Clin J Am Soc Nephrol 2012;7:612-618]

# CONCLUSION

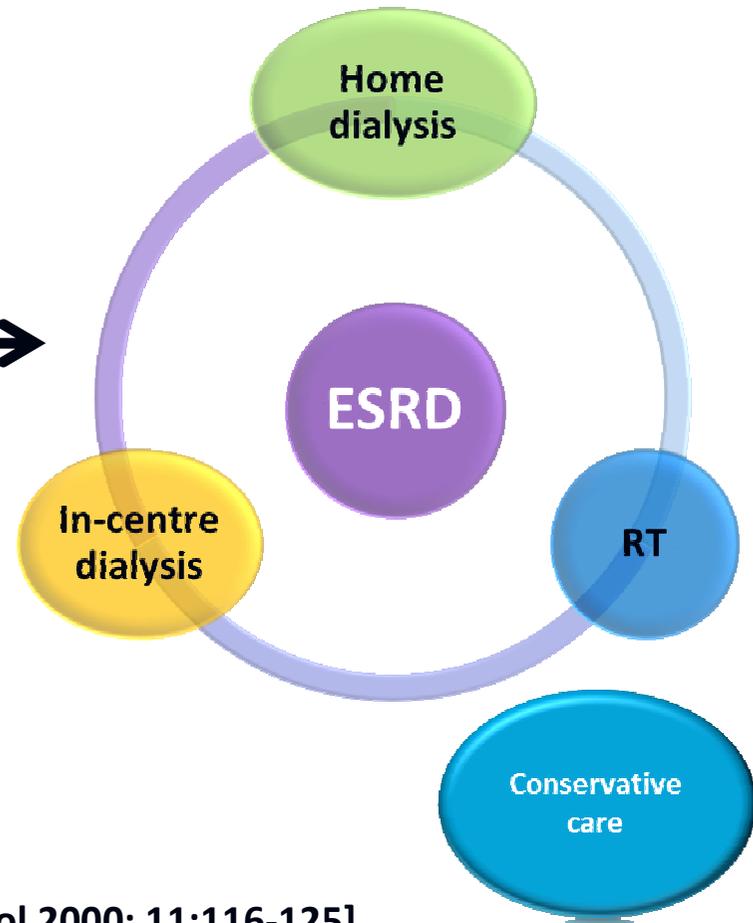
- **L'objectif c'est d'améliorer le passage d'une méthode à l'autre**
- **Ne plus parler d'échec mais de transition thérapeutique**
- **De répondre au concept de prise en charge intégrée optimisée**

# The patients care is moving toward a new concept

## Integrated care 2000

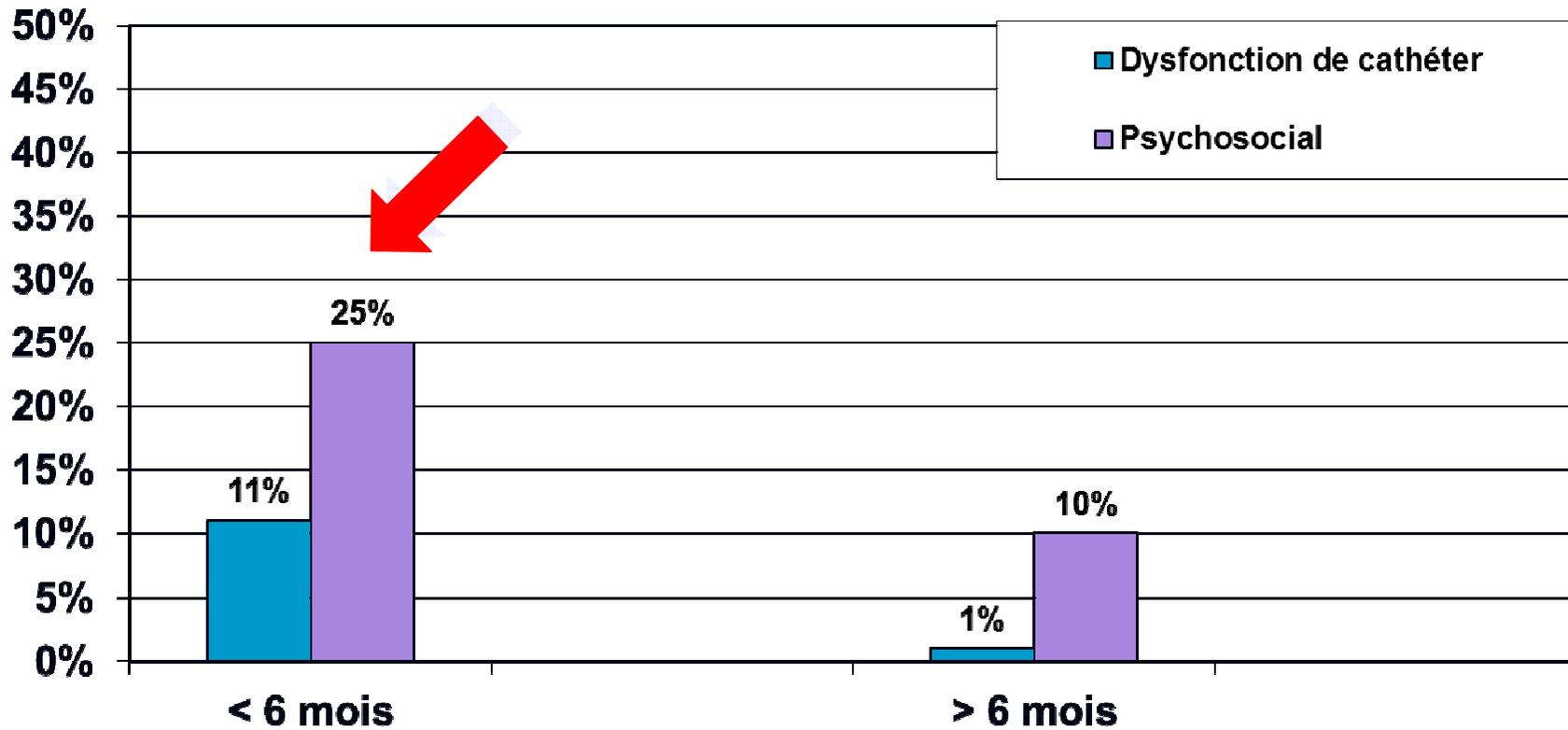


## Integrated care 2013



[Van Biesen W, J Am Soc Nephrol 2000; 11:116-125]

# Causes of the early transfer on HD



[B Descoedre, Perit Dial Int 2007; 28: 259-267]