XXXII
SANTANDER
Reunión Nacional de Coordinadores de Trasplantes
18 al 20 de octubre 2017

Resultados del trasplante renal

Dr. Salvador Gil-Vernet
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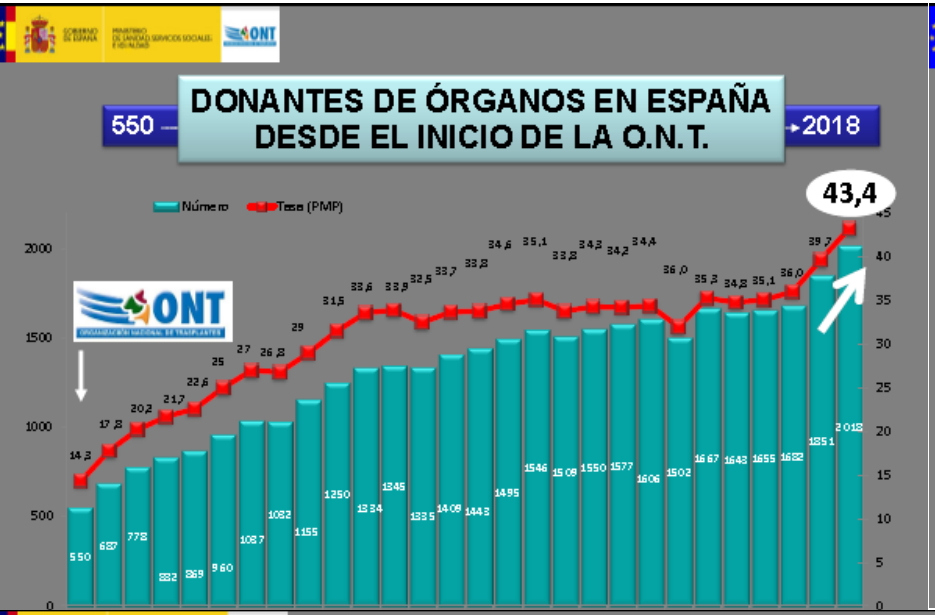
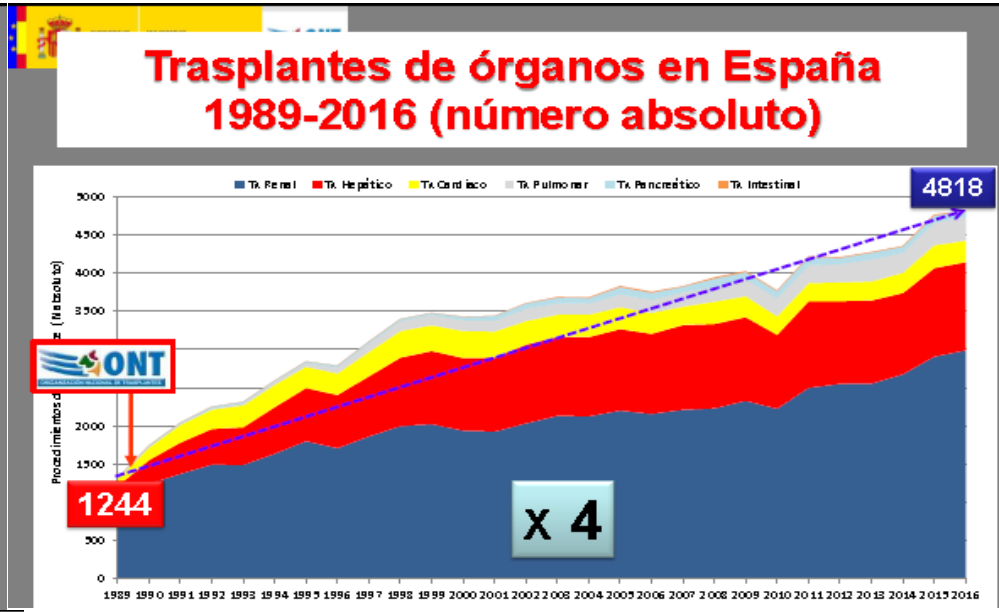
Hospital Universitari de Bellvitge

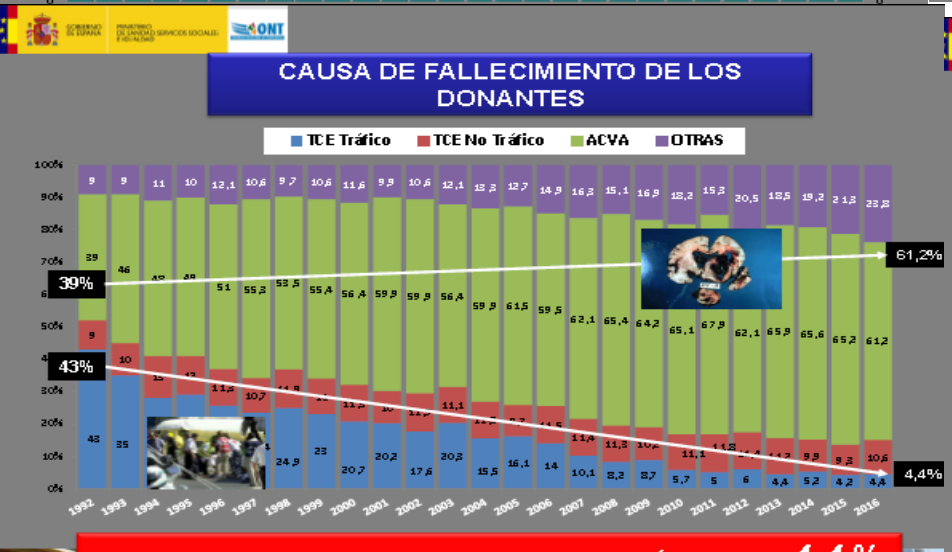
How Spain Reached 40 Deceased Organ Donors per Million Population

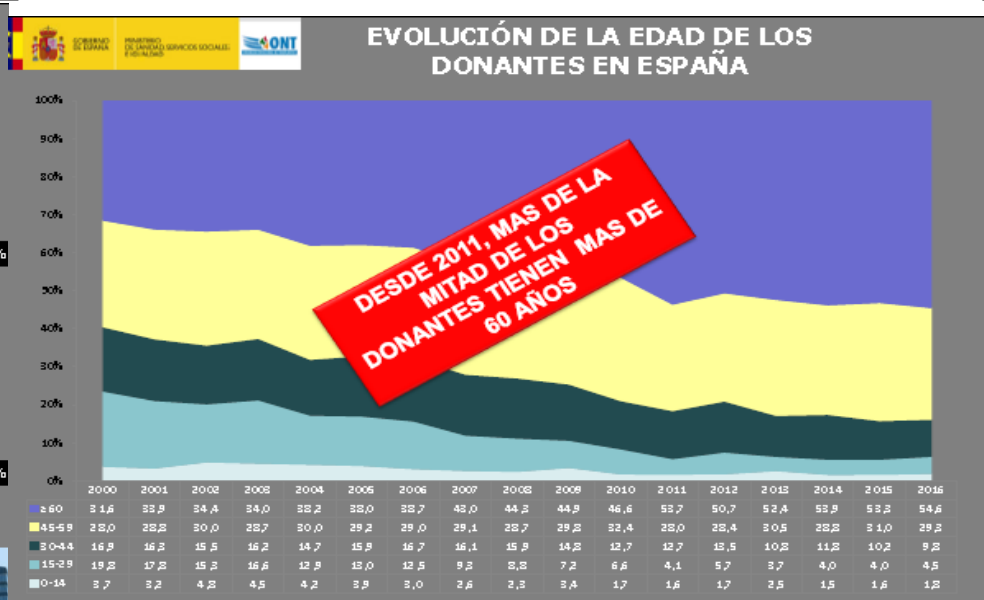
R. Matesanz, B. Domınguez-Gil*, E. Coll, B. Mahıllo and R.Marazuela

American Journal of Transplantation 2017





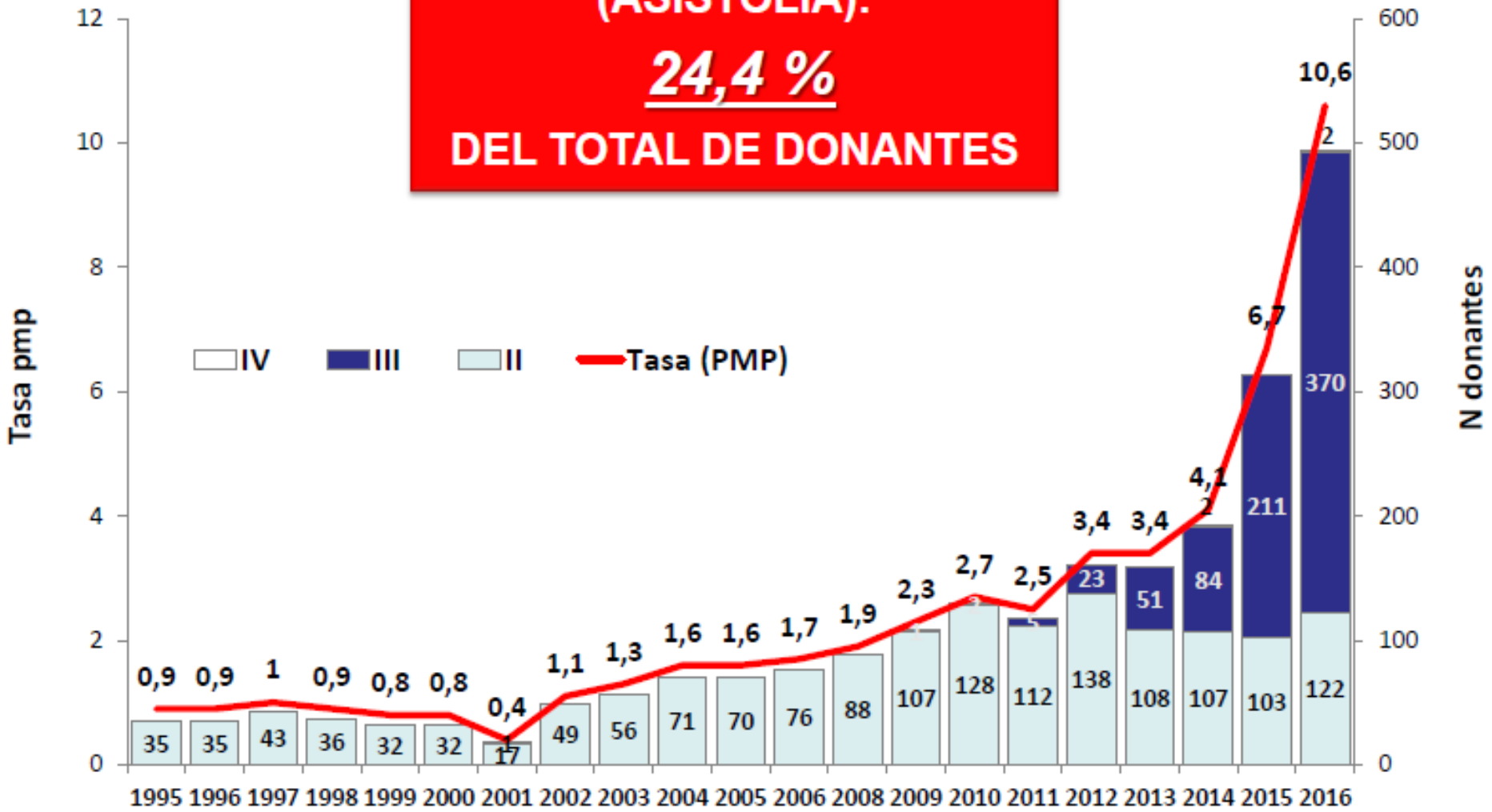




DONANTES EN PARADA CIRCULATORIA (ASISTOLIA):

24,4 %

DEL TOTAL DE DONANTES

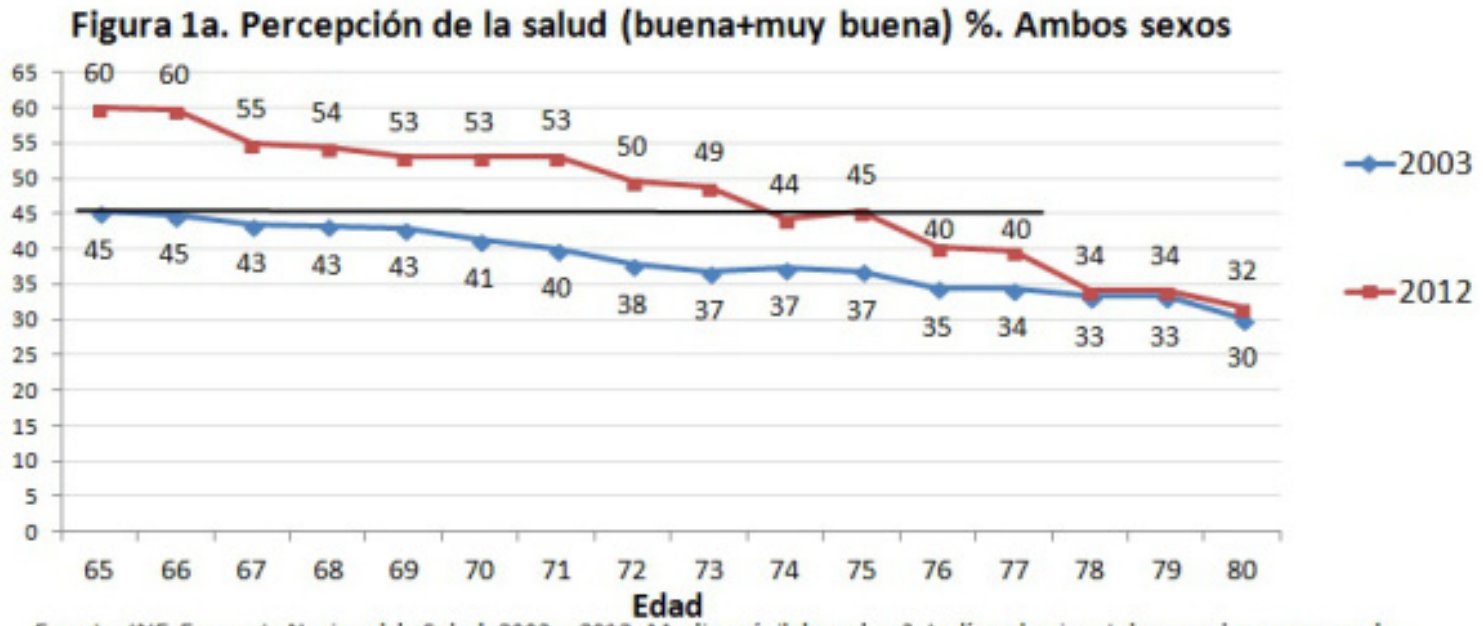


HUB 2017 : 45% de los donantes lo son en asistolia controlada

Donante renal con criterios expandidos

- >60 a
- >65 a

- Donantes en asistolia con o sin disfuncion renal



Fuente: INE: Encuesta Nacional de Salud, 2003 y 2012. Media móvil de orden 3. La línea horizontal enrasa las personas de 64-65-66 años en 2003 con las de 73-74-75-76 de 2012.

Remeasuring Aging Demography Science 2010

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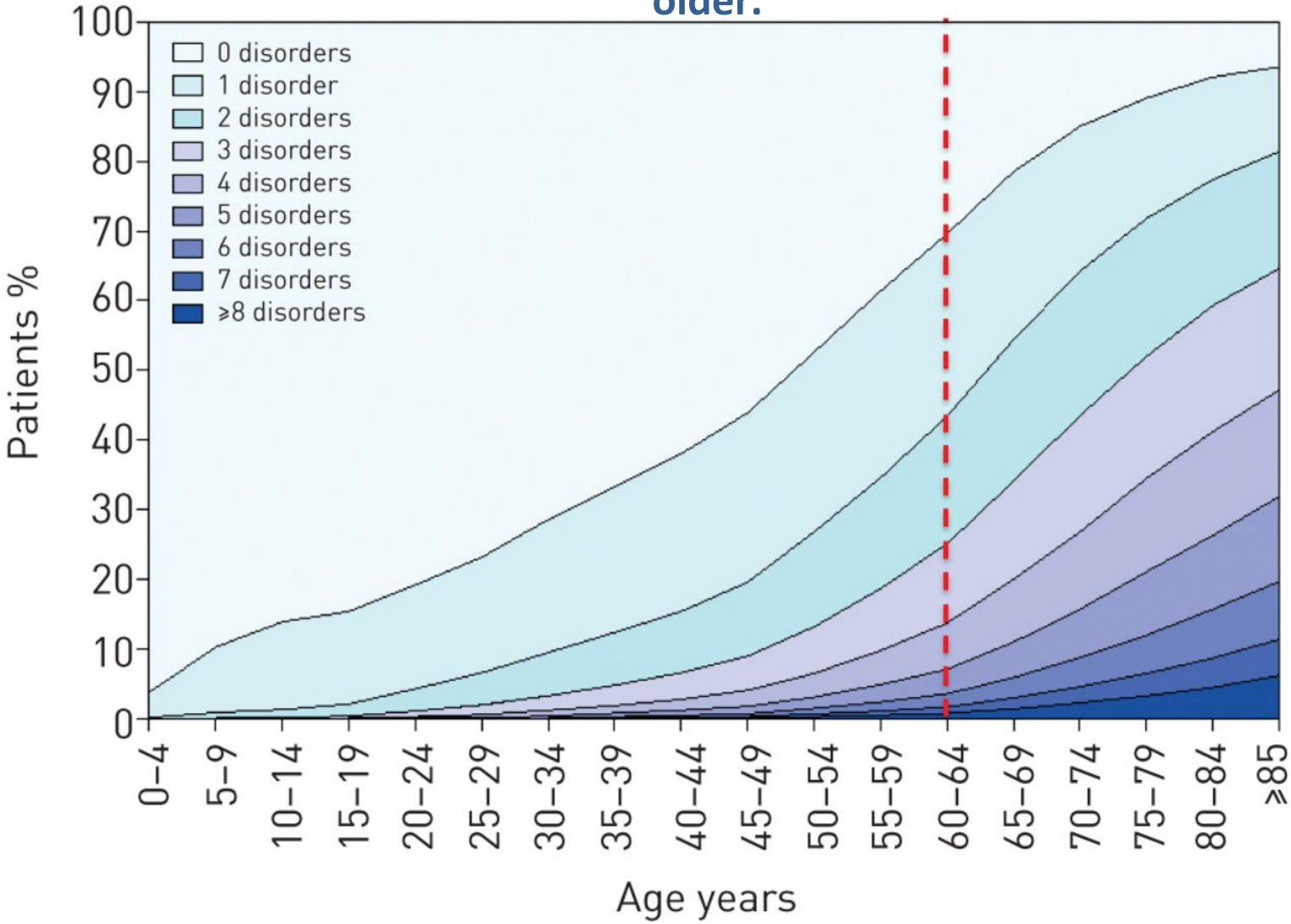
293 años

Number of chronic comorbidities by age stratum. The number of comorbidities increases with age and is larger in individuals 65 years and older.



. *Models of comorbidity for multifactorial disorders. Am J Hum Genet 1995*

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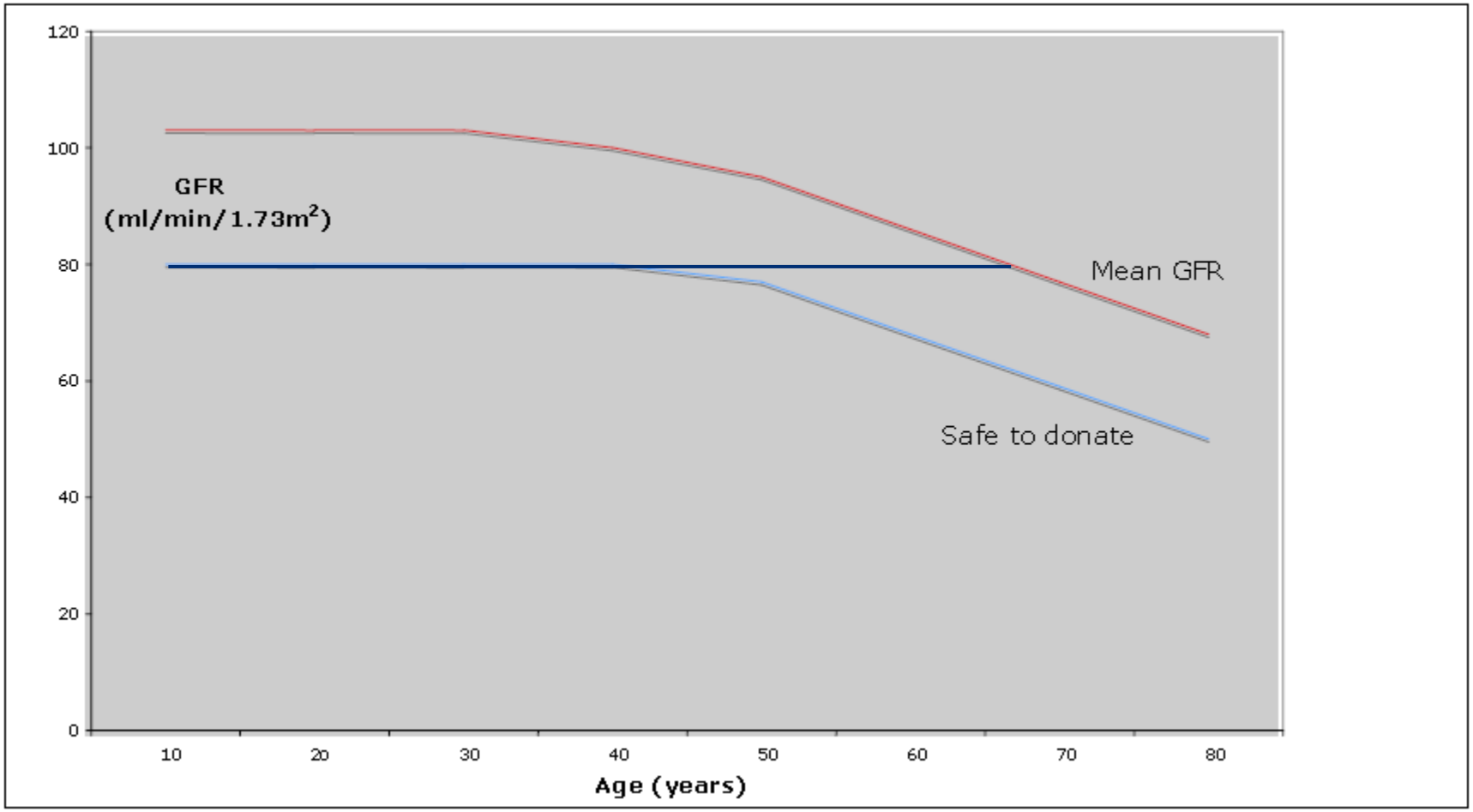
Figure 5.5.1 Acceptable GFR by donor age prior to donation



Donor age and delayed graf function as predictors of renal allograft suvival in rejection-free patients

Table 4. Risk factors for graft failure in rejection-free patients

Variable	$P=$	Multivariate analysis
DGF	0.0002	2.42 (1.53–3.84)
Donor age > 50 years	0.0007	2.40 (1.45–4.01)
Second transplant	0.1308	1.61 (0.86–2.98)
Dual therapy	0.6346	1.13 (0.68–1.88)

Relative risks and (in parentheses) 95% confidence interval for multivariate Cox's proportional hazard model.

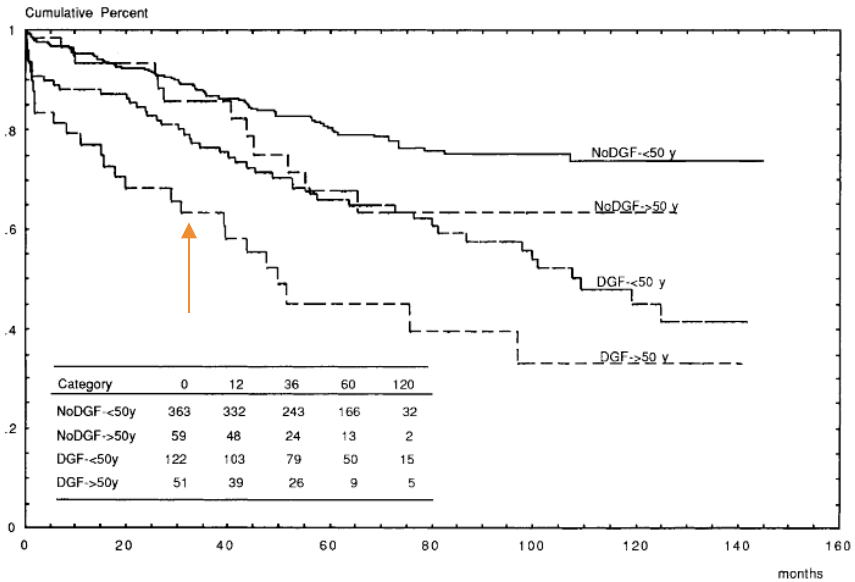


Fig. 2. Graft survival according to donor age (older or younger than 50 years) and the presence or absence of delayed graft function ($P < 0.0001$). The Table summarizes the number of patients at risk at 0, 12, 36, 60 and 120 months.

F. Moreso. D. Seron, S. Gil-Vernet, L. Riera et al. NDT 1999

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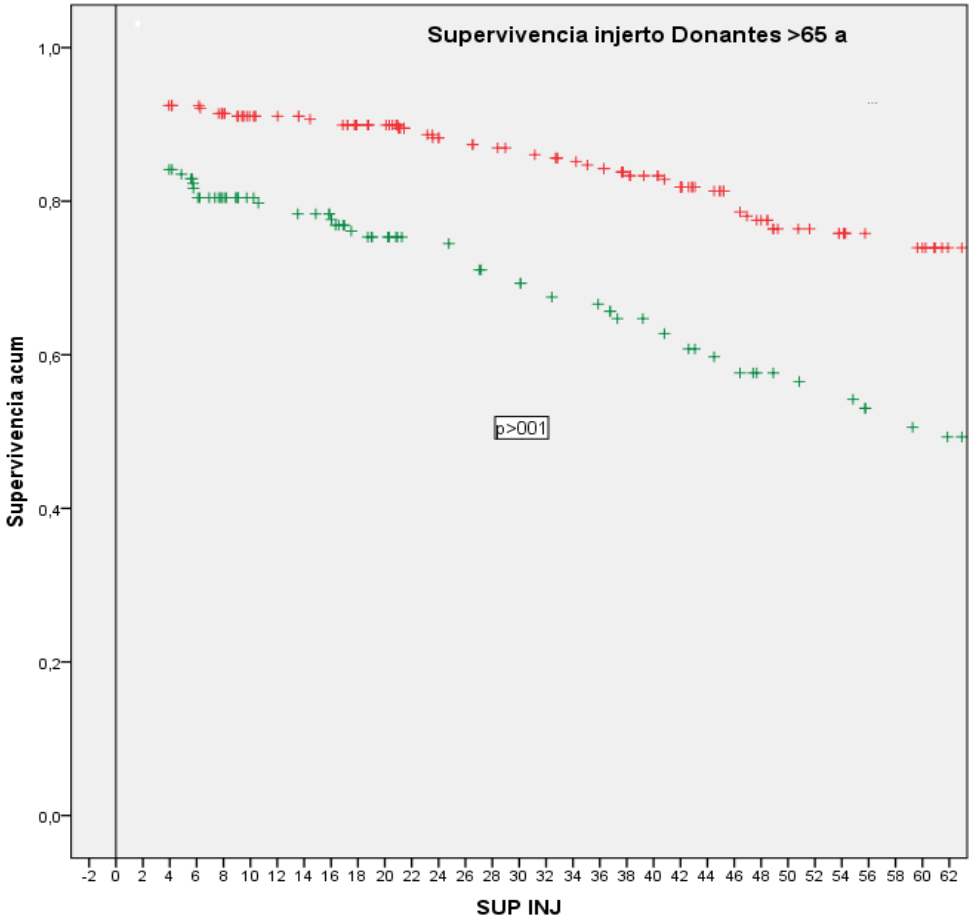
DGF: efecto sobre la supervivencia del injerto en donantes de mas de 65 a

- N: 455
- Edad : 73+/- 5 (65-88)
- Genero : 50% H/M
- CIT: 19 +/-5 horas
- WIT: 43 +/-14 min.
- DGF: 153 (34%)
- PP : 29%
- CS : 41%



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The NEW ENGLAND JOURNAL of MEDICINE

Machine Perfusion or Cold Storage in Deceased-Donor Kidney Transplantation

N ENGL J MED 366;8 NEJM.ORG FEBRUARY 23, 2012

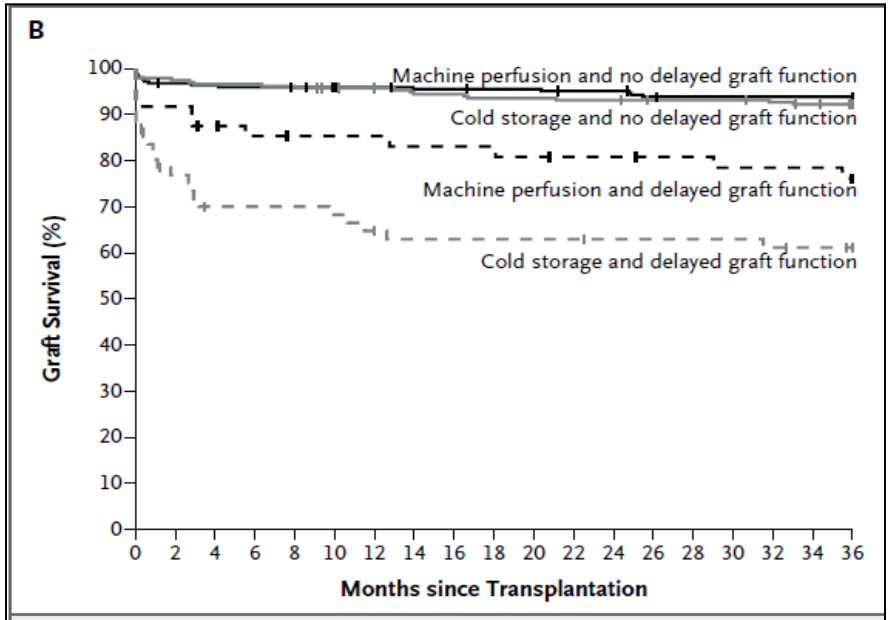

Figure 1. Graft Survival of Deceased-Donor Kidneys at 3 Years.
Panel A shows graft survival in 672 recipients in the main data set, with a hazard ratio for graft failure in the machine-perfusion group of 0.60 (95% confidence interval, 0.37 to 0.97; P=0.04). Panel B shows the post hoc analysis of a subgroup of 588 recipients of kidneys donated after brain death, with data split according to whether delayed graft function developed in the recipient. Delayed graft function was defined as the need for dialysis in the first week after transplantation.

1A). Three-year graft survival after machine perfusion was also superior to that after cold storage for kidneys donated after brain death (91% vs. 86%; adjusted hazard ratio, 0.54; P=0.02) but not for kidneys donated after circulatory death.

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Machine Perfusion Versus Cold Storage for the Preservation of Kidneys Donated After Cardiac Death
A Multicenter, Randomized, Controlled Trial (84 pairs)

Ina Jochmans, MD Cyril Moers, MD. Ann Surg2010

TABLE 3. Multivariate Analysis of the Risk of Delayed Graft Function

Variable	Adjusted Odds Ratio (95% Confidence Interval)	*P*
Machine perfusion vs static cold storage	0.43 (0.20–0.89)	0.025
Donor age, yr	1.04 (1.01–1.08)	0.008
Recipient age, yr	1.04 (1.00–1.08)	0.028
Retransplant vs first transplant	0.77 (0.39–1.54)	0.46
Panel reactive antibody level, %	2.97 (0.90–9.87)	0.075
HLA mismatches, n	1.28 (0.87–1.88)	0.21
Duration of pretransplantation dialysis, d	1.01 (0.88–1.27)	0.92
Cold ischemic time, h	1.10 (1.01–1.21)	0.039
Warm ischemic time (10 min)*	3.40 (1.87–6.17)	<0.0001

*Warm ischemic time: time from circulatory arrest until the start of cold perfusion. Warm ischemic time was grouped into 10-minute intervals and a warm ischemic time of less than 10 minutes was used as the baseline.

HLA indicates human leukocyte antigen.

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French controlled donation after circulatory arrest (cDCD) program: First results

agence de la biomédecine

C. Antoine[10], M. Videcoq[5], B. Riou[8], D. Dorez[1], G. Cheisson[3], L. Martin-Lefevre[4], L. Durand[10], E. Savoye[10], C. Legeai[10],

First Kidney graft results : cDCD vs. DBD

Inclusion

- cDCD and DBD (≤65 years)
- Adult recipients awaiting a 1st transplant
- cDCD inclusion between jan 2015 and oct 2016 → 92 grafts
- DBD inclusion between jan 2013 and oct 2015 →3934 grafts

Second cohort – Matching cohort criteria:

- Donor / Recipient Age +/- 10 years
- Time spent on dialysis :None, < 36 months, ≥ 36 months
- Cause of ESRD : Diabetes, other
- cPRA : 0%, 1-84%, 85-100%

Result of the matching process

- Between 2 and 10 DBD for one cDCD
- 79% of cDCD have 10 DBD controls
- 92 cDCD grafts for 846 DBD controls

Matching cohort - First results:

- PNF: 1% for cDCD vs. 4% for DBD, NS
- DGF: 9% for cDCD vs. 18% for DBD, p=0.033
- eGFR at discharge: 48ml/min for cDCD vs. 44ml/min for DBD, NS

Table 1. First Kidney graft results : cDCD vs. DBD

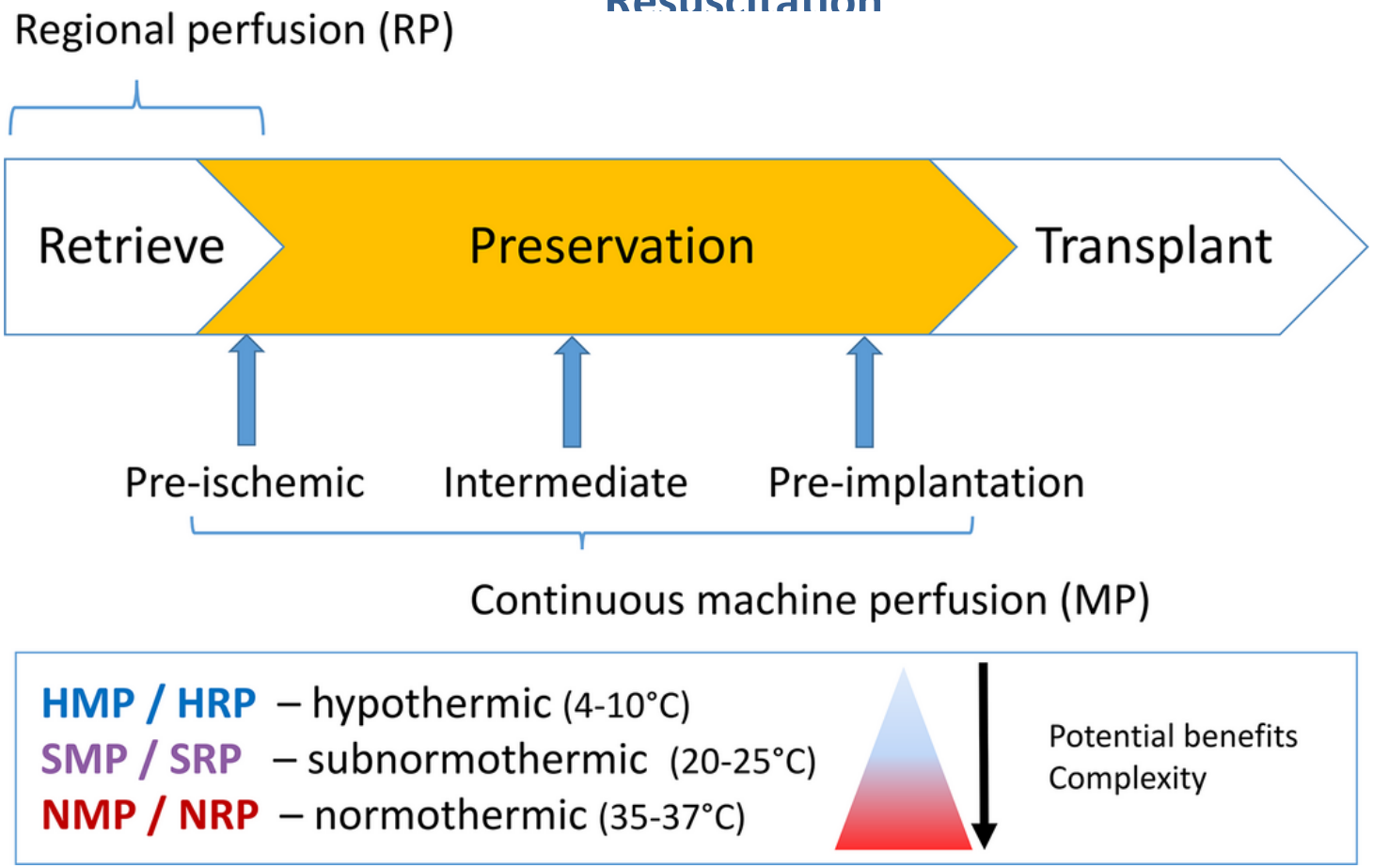
		DBD (N=3,934)		cDCD (N=84)		
		N	%	N	%	p-value
Donor Age		48,1		49,1		0,21
Recipient Age		49,2		56,8		<0,001
Cause of ESRD	Diabetes	352	9%	10	11%	0,005
	PKD	706	18%	19	21%	
cPRA (%)	0%	2393	61%	49	53%	0,003
	1-84%	1192	30%	41	45%	
	85-100%	349	9%	2	2%	
Time spent on dialysis	Preemptive	405	10%	20	22%	0,002
	≥ 36 months	1607	41%	27	29%	
Waiting time (month), mean		26,8		25,5		0,58
CIT (h), mean		16,6		10,3		<0,001
Outcomes results						
PNF		106	3%	1	1%	0,33
DGF		735	20%	8	9%	0,008
DGF	preemptive excluded	697	21%	8	11%	0,037
Matching cohort		DBD (N=846)		cDCD (N=84)		
CIT (h)		16,5		10,3		<0,001
PNF		29	4%	1	1%	0,21
DGF		138	18%	8	9%	0,033
Initial hospitalization (day) , mean		15		14		0,7
eGFR at discharge (MDRD, ml/min)		44		48		0,07
% of DGF with only one dialysis		20	19%	2	29%	0,53

PNF: primary non function, DGF: delayed graft function

P-value: chi-square test or two-sided Fisher's exact test for qualitative variables and Student's t-test or Wilcoxon's rank sum test for quantitative variables

AJT April 2017

Past, Present, and Future of Dynamic Kidney and Liver Preservation and Resuscitation



The different dynamic preservation strategies currently entering clinical practice with the different modalities of their use. HMP, hypothermic machine perfusion; HRP, hypothermic regional perfusion; NMP, normothermic machine perfusion; NRP, normothermic regional perfusion; SMP, subnormothermic machine perfusion; SRP, subnormothermic regional perfusion.

American Journal of Transplantation 2016

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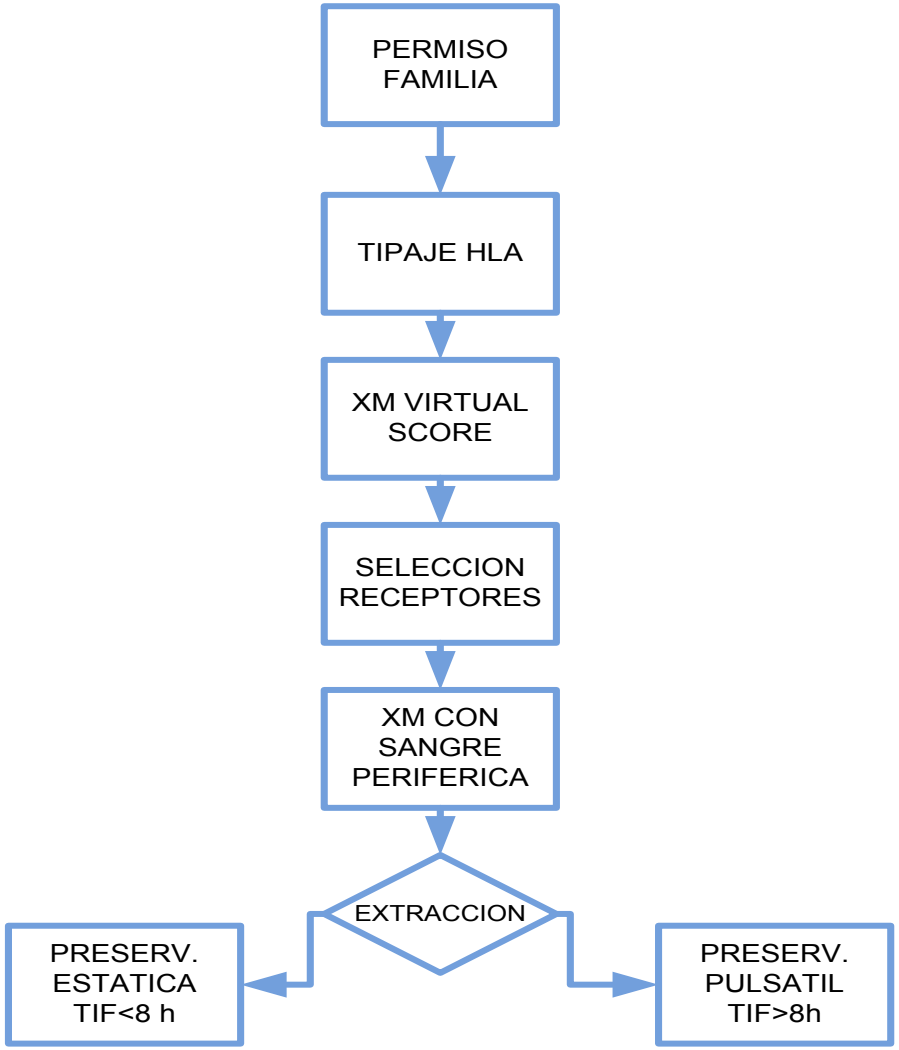
Donantes en asistolia

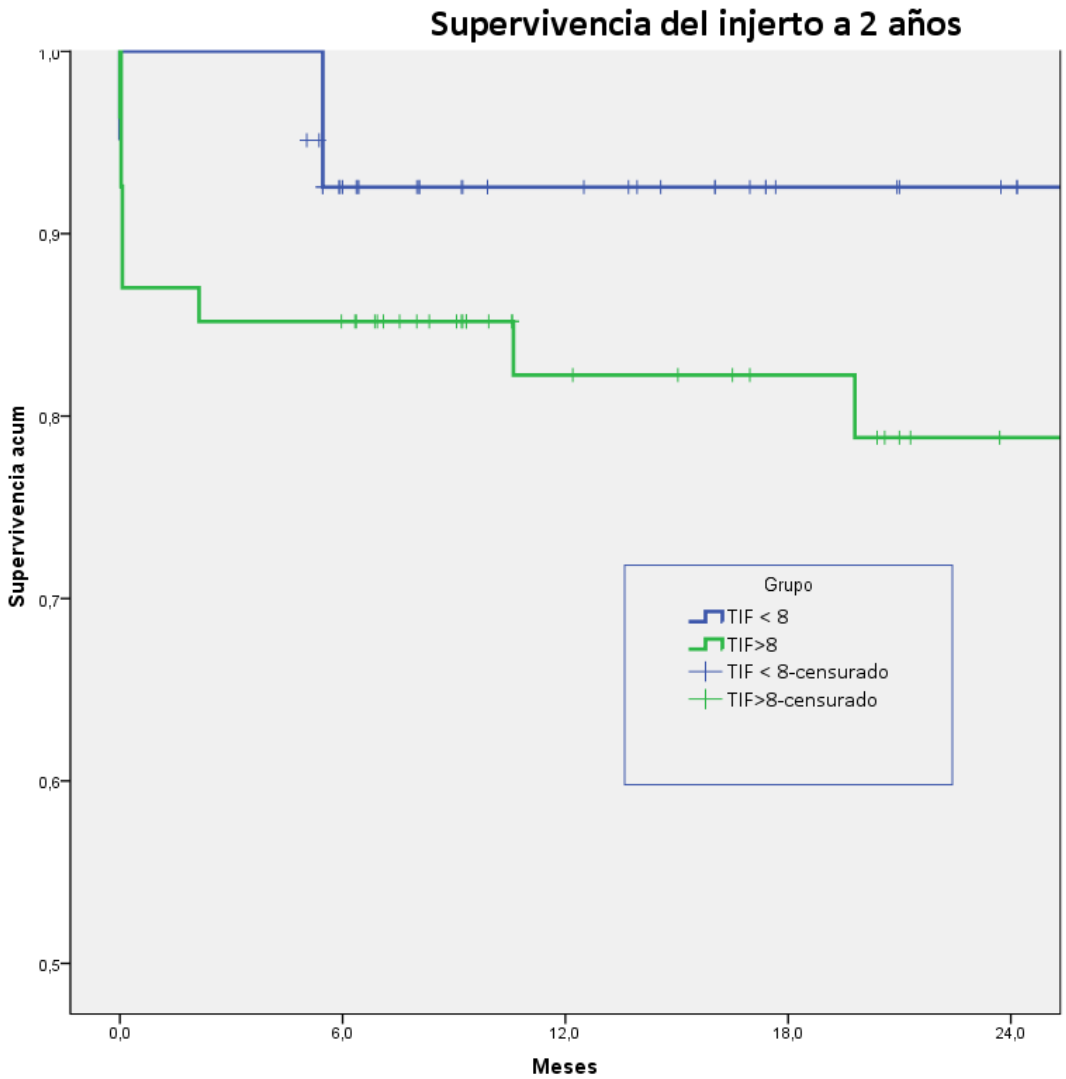
Como reducir la isquemia fría.

¿Cambios en la organización o máquinas?



- N= 95 trasplantes (8/ 2013 –5/ 2017)
  - TIF<8h : 41/54
- TIF de la serie: 13.4h
  - TIF < 8h : 5 +/- 1.5h
  - -TIF>8H : 14+/-7
- Edad del donante 63+/-11a
- Edad del receptor 62+/-12a
- Causa perdida del injerto :
  - Exitus 5
  - Rechazo 1
  - Trombosis vascular 5

Supervivencia del injerto con donantes tipo M III H. Bellvitge



ELSEVIER

Journal of the American College of Surgeons

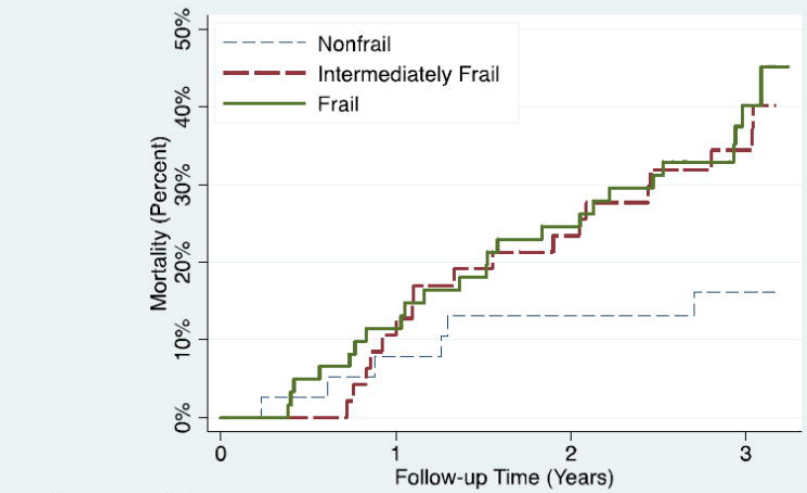
Volume 217, Issue 4, October 2013, Pages 665-670.e1

Original scientific article

Too Frail for Surgery? Initial Results of a Large Multidisciplinary Prospective Study Examining Preoperative Variables Predictive of Poor Surgical Outcomes

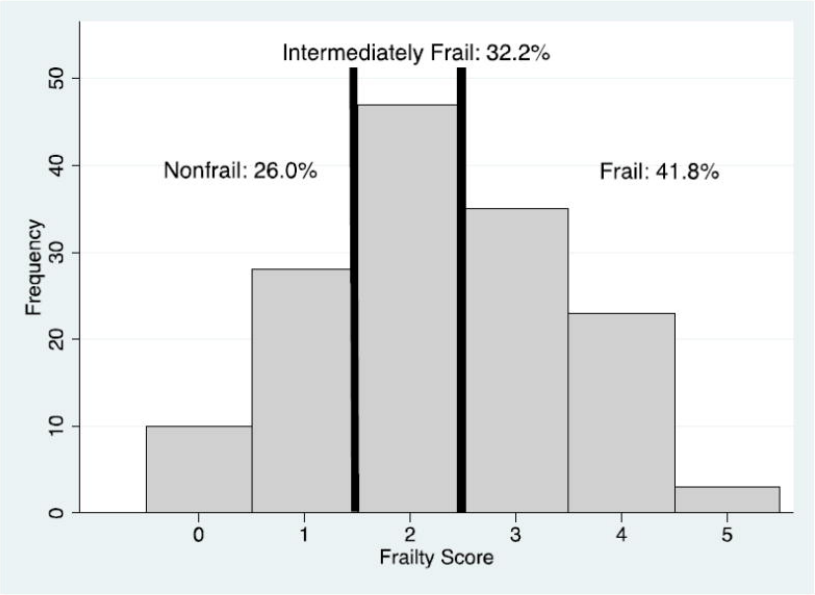
Presented at the Southeastern Section of the American Urological Association meeting, March 2013, Williamsburg, VA.

Louis M. Revenig BS[a], Daniel J. Canter MD[a, d], Maxwell D. Taylor BA[a], Caroline Tai MPH[a], John F. Sweeney MD, FACS[b], Juan M. Sarmiento MD, FACS[b, d], David A. Kooby MD, FACS[c, d], Shishir K.



Number at risk				
Nonfrail	38	35	33	24
Intermediately Frail	47	42	36	24
Frail	61	54	46	18

Figure 1



Distribution of Frailty Score in Study Population

Table 2

Mortality and Hospitalization, by Frailty

	Nonfrail	Intermediately Frail	Frail
Hazard ratio of Mortality			
Unadjusted	Reference	2.67 (1.06, 6.73)	2.90 (1.18, 7.11)
Adjusted for age, sex, comorbidity, and disability	Reference	2.68 (1.02, 7.07)	2.60 (1.04, 6.49)
Incident Rate Ratio of Hospitalization			
Unadjusted	Reference	0.74 (0.49, 1.12)	1.48 (1.05, 2.07)
Adjusted for age, sex, comorbidity, and disability	Reference	0.76 (0.49, 1.16)	1.43 (1.00, 2.03)

J Am Geriatr Soc. 2013

Stretching the Limits of Renal Transplantation in Elderly Recipients of Grafts from Elderly Deceased Donors . Dutch Registry & European Senior Program (ESP)

Table 3. Comparison analyses of transplant outcomes

Transplant Outcomes	Recipients <65 yr		Recipients ≥65 yr			
	Young Donor (<65 yr) DBD	Young Donor (<65 yr) DCD	Young Donor (<65 yr) DBD	Young Donor (<65 yr) DCD	Elderly Donor (≥65 yr) DBD	Elderly Donor (≥65 yr) DCD
PNF[a]	0.68 (0.34 to 1.36)	1.34 (0.68 to 2.64)	1 (Ref)	1.12 (0.44 to 2.84)	0.76 (0.31 to 1.87)	1.93 (0.81 to 4.58)
Adjusted model	0.61 (0.30 to 1.23)	1.28 (0.64 to 2.56)	1 (Ref)	0.98 (0.38 to 2.54)	0.48 (0.18 to 1.28)	1.18 (0.45 to 3.06)
DGF[b]	1.16 (0.75 to 1.80)	6.94 (4.47 to 10.77)[c]	1 (Ref)	10.45 (5.86 to 18.64)[c]	1.77 (1.05 to 2.98)[c]	13.94 (7.44 to 26.12)[c]
Adjusted model	1.08 (0.69 to 1.69)	7.09 (4.50 to 11.17)[c]	1 (Ref)	10.43 (5.75 to 18.91)[c]	1.84 (1.04 to 3.26)[c]	14.87 (7.47 to 29.61)[c]
Acute rejection within 3 mo[d]	1.52 (0.89 to 2.57)	1.94 (1.14 to 3.30)[c]	1 (Ref)	0.86 (0.39 to 1.89)	1.35 (0.71 to 2.56)	3.19 (1.64 to 6.21)[c]
Adjusted model	1.43 (0.84 to 2.44)	1.79 (1.04 to 3.08)[c]	1 (Ref)	0.80 (0.36 to 1.76)	1.24 (0.62 to 2.46)	2.78 (1.35 to 5.73)[c]
1-Yr graft failure[e]	0.65 (0.43 to 1.00)	0.73 (0.46 to 1.15)	1 (Ref)	1.23 (0.70 to 2.16)	1.18 (0.71 to 1.95)	1.52 (0.88 to 2.63)
Adjusted model	0.62 (0.40 to 0.95)[c]	0.77 (0.50 to 1.19)	1 (Ref)	1.14 (0.65 to 2.00)	0.98 (0.56 to 1.70)	1.26 (0.69 to 2.31)
1-Yr death-censored graft failure[e]	1.08 (0.58 to 2.01)	1.44 (0.77 to 2.68)	1 (Ref)	1.85 (0.86 to 3.98)	1.33 (0.63 to 2.80)	1.98 (0.91 to 4.31)
Adjusted model	0.99 (0.53 to 1.86)	1.40 (0.75 to 2.63)	1 (Ref)	1.70 (0.79 to 3.68)	1.01 (0.46 to 2.24)	1.48 (0.64 to 3.42)
1-Yr mortality[f]	0.47 (0.32 to 0.67)[c]	0.52 (0.37 to 0.74)[c]	1 (Ref)	1.10 (0.70 to 1.74)	1.34 (0.91 to 1.99)	1.64 (1.07 to 2.53)[c]
Adjusted model	0.49 (0.34 to 0.71)[c]	0.52 (0.37 to 0.74)[c]	1 (Ref)	1.11 (0.70 to 1.76)	1.26 (0.82 to 1.96)	1.77 (1.09 to 2.86)[c]
5-Yr graft failure[e]	0.70 (0.51 to 0.95)[c]	0.66 (0.49 to 0.89)[c]	1 (Ref)	1.08 (0.72 to 1.64)	1.26 (0.88 to 1.82)	1.84 (1.25 to 2.71)[c]
Adjusted model	0.65 (0.46 to 0.91)[c]	0.72 (0.51 to 1.01)	1 (Ref)	1.03 (0.68 to 1.57)	1.00 (0.67 to 1.49)	1.49 (0.97 to 2.29)
5-Yr death-censored graft failure[e]	1.41 (0.84 to 2.34)	1.22 (0.73 to 2.04)	1 (Ref)	1.52 (0.78 to 2.96)	1.44 (0.78 to 2.68)	2.67 (1.20 to 4.30)[c]
Adjusted model	1.38 (0.82 to 2.32)	1.14 (0.68 to 1.91)	1 (Ref)	1.37 (0.70 to 2.67)	1.03 (0.54 to 2.00)	1.57 (0.79 to 3.11)
5-Yr mortality[f]	0.45 (0.32 to 0.65)[c]	0.50 (0.35 to 0.71)[c]	1 (Ref)	1.13 (0.72 to 1.78)	1.48 (1.00 to 2.19)[c]	1.80 (1.17 to 2.76)[c]
Adjusted model	0.48 (0.33 to 0.69)[c]	0.49 (0.35 to 0.70)[c]	1 (Ref)	1.15 (0.73 to 1.83)	1.35 (0.87 to 2.09)	1.86 (1.15 to 3.02)[c]

In adjusted models, the following variables were taken into account: donor sex, recipient sex, donor hypotensive period, donor terminal Modification of Diet in Renal Disease, donor smoking, CIT, HLA-A mismatch, HLA-B mismatch, HLA-Dr mismatch, recipient original disease, and recipient dialysis vintage.

[a]Data available for 2850 patients.

[b]Data available for 2668 patients.

[c]ORs or HRs with $P<0.05$.

[d]Data available for 2667 patients.

[e]Data available for 2850 patients.

[f]Data available for 2824 patients.

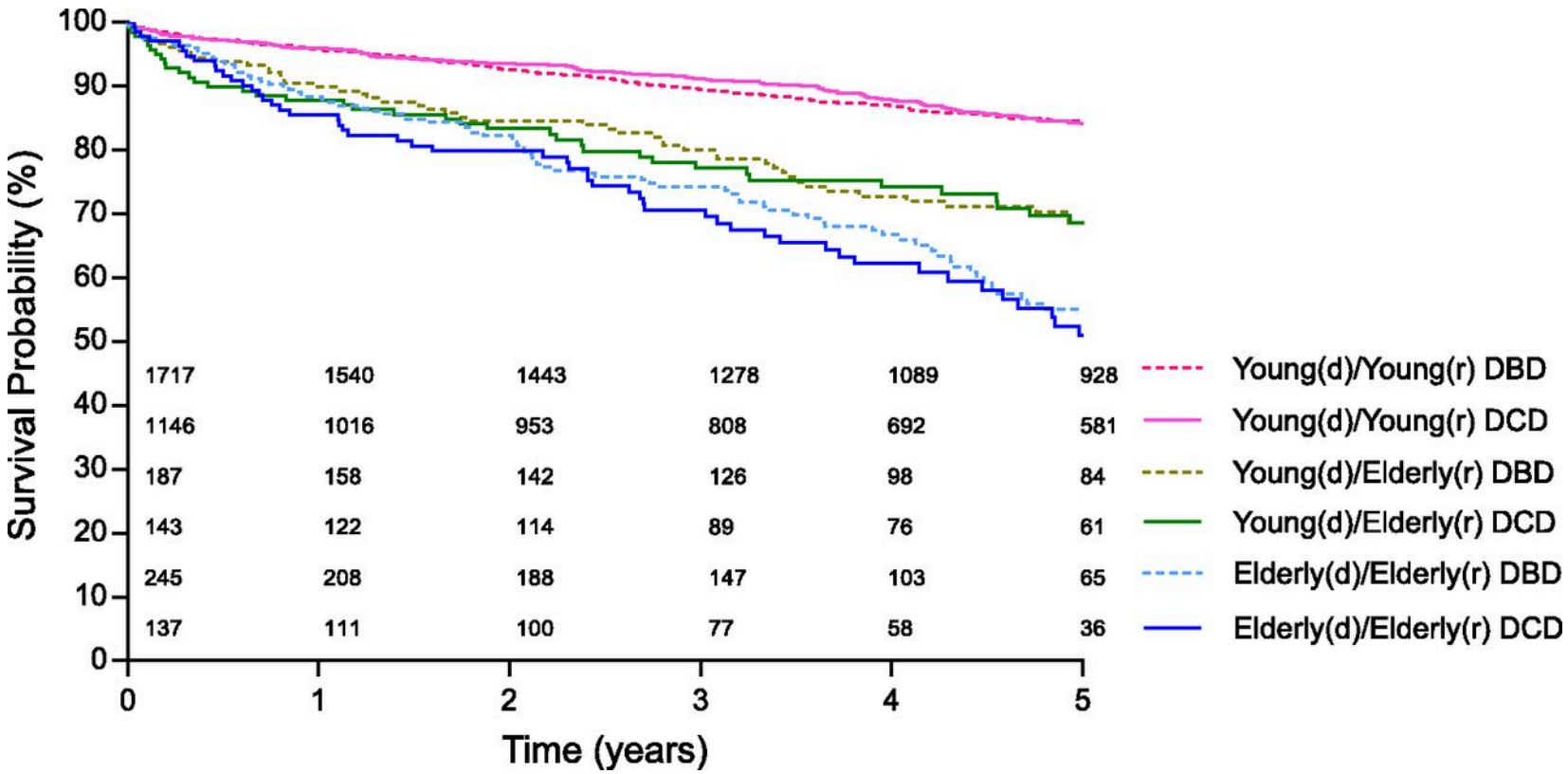
[a,b,d]Presented are ORs (95% CI).

[e,f]Presented are HRs (95% CI).

Hessel Peters-Sengers et al. JASN 2017;28:621-631

JASN

Five-year patient survival according to recipient-donor group.

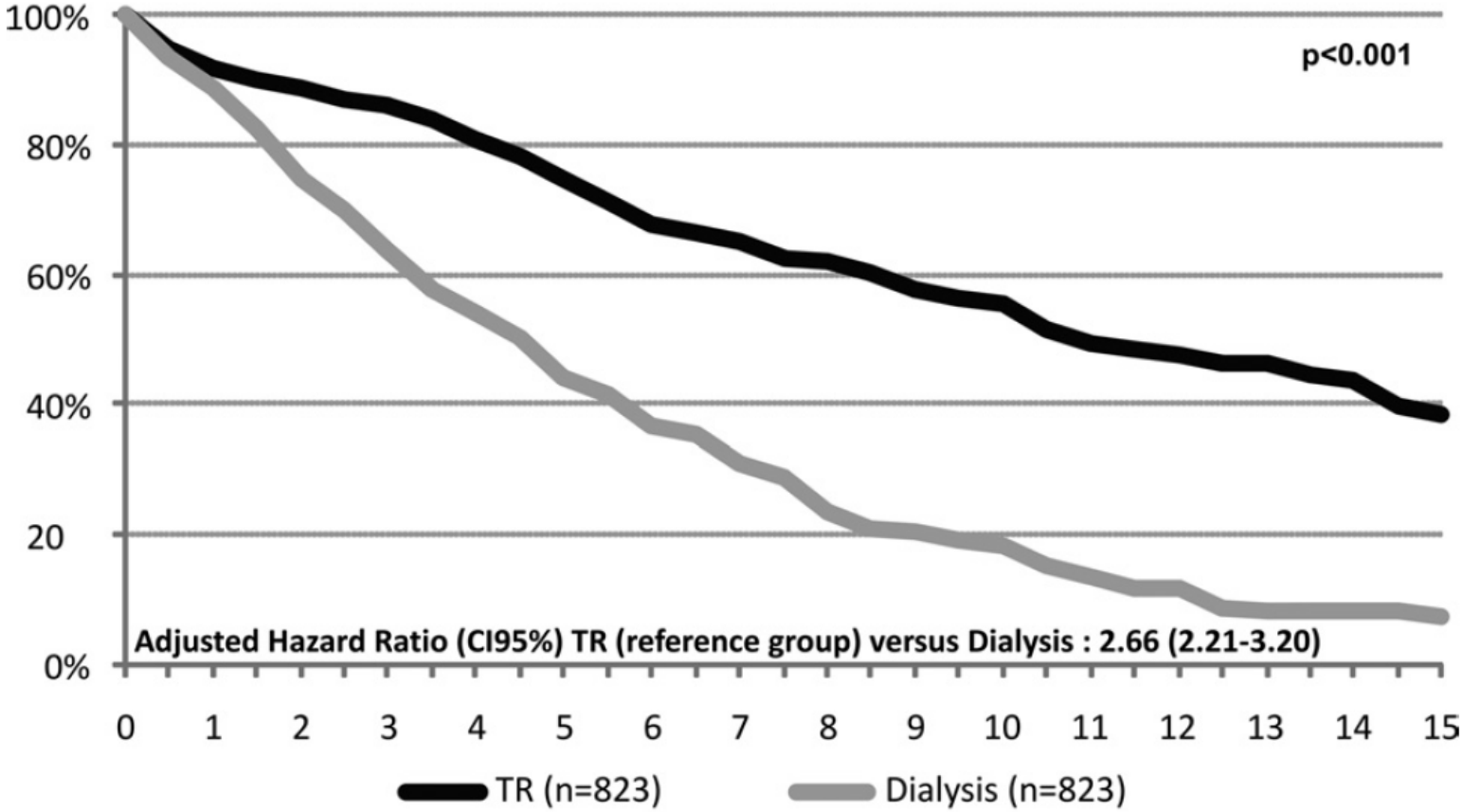


Hessel Peters-Sengers et al. JASN 2017;28:621-631

JASN

A Paired Survival Analysis Comparing Hemodialysis and Kidney Transplantation From Deceased Elderly Donors Older Than 65 Years

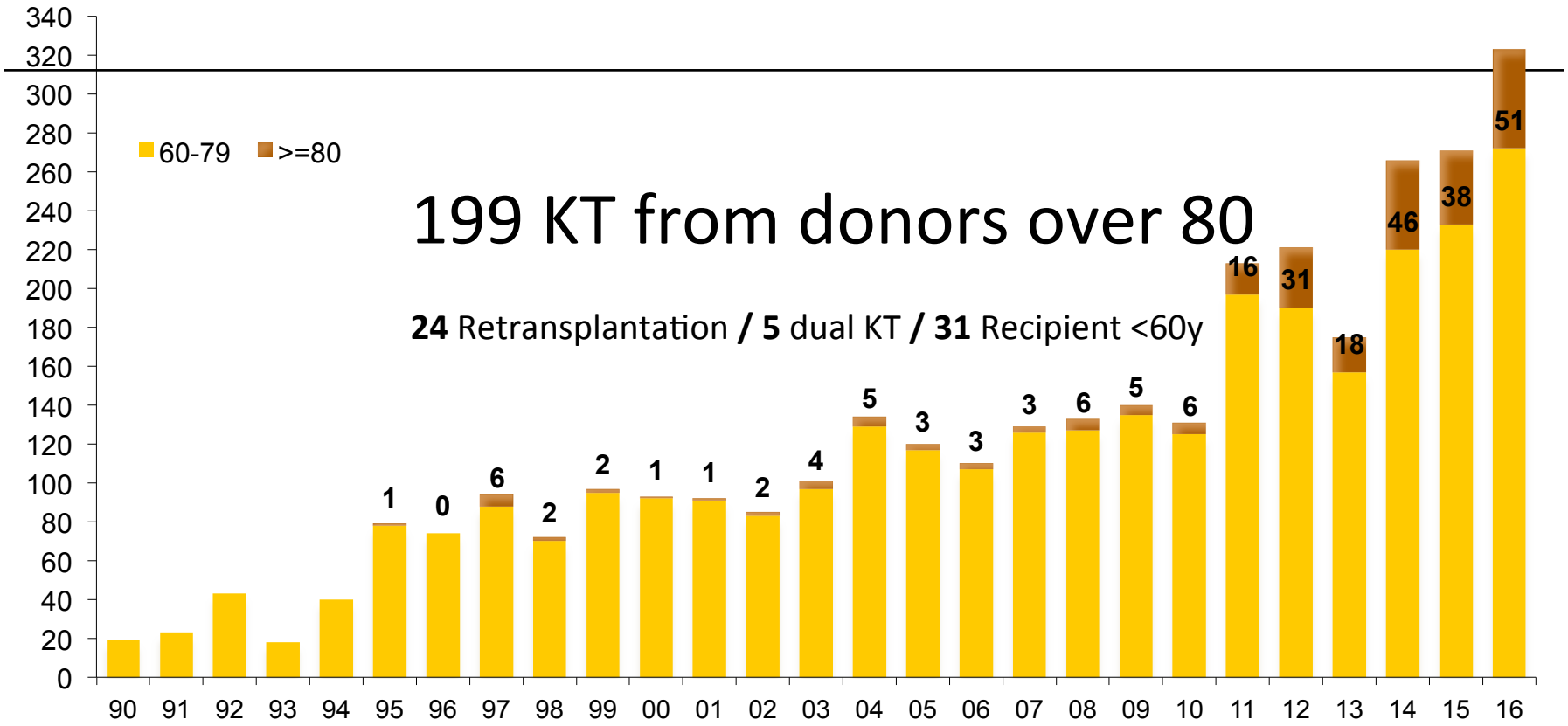
Josep Lloveras,[1] Emma Arcos,[2] Jordi Comas,[2] Marta Crespo,[1] and Julio Pascual[1,3]



Conclusion. Our study demonstrates that despite the fact that kidney transplantation from elderly deceased donors is associated with reduced graft and patient survival, their paired counterpart patients remaining on dialysis have a risk of death 2.66 times higher.

Transplantation 2015 May;99(5):991-6

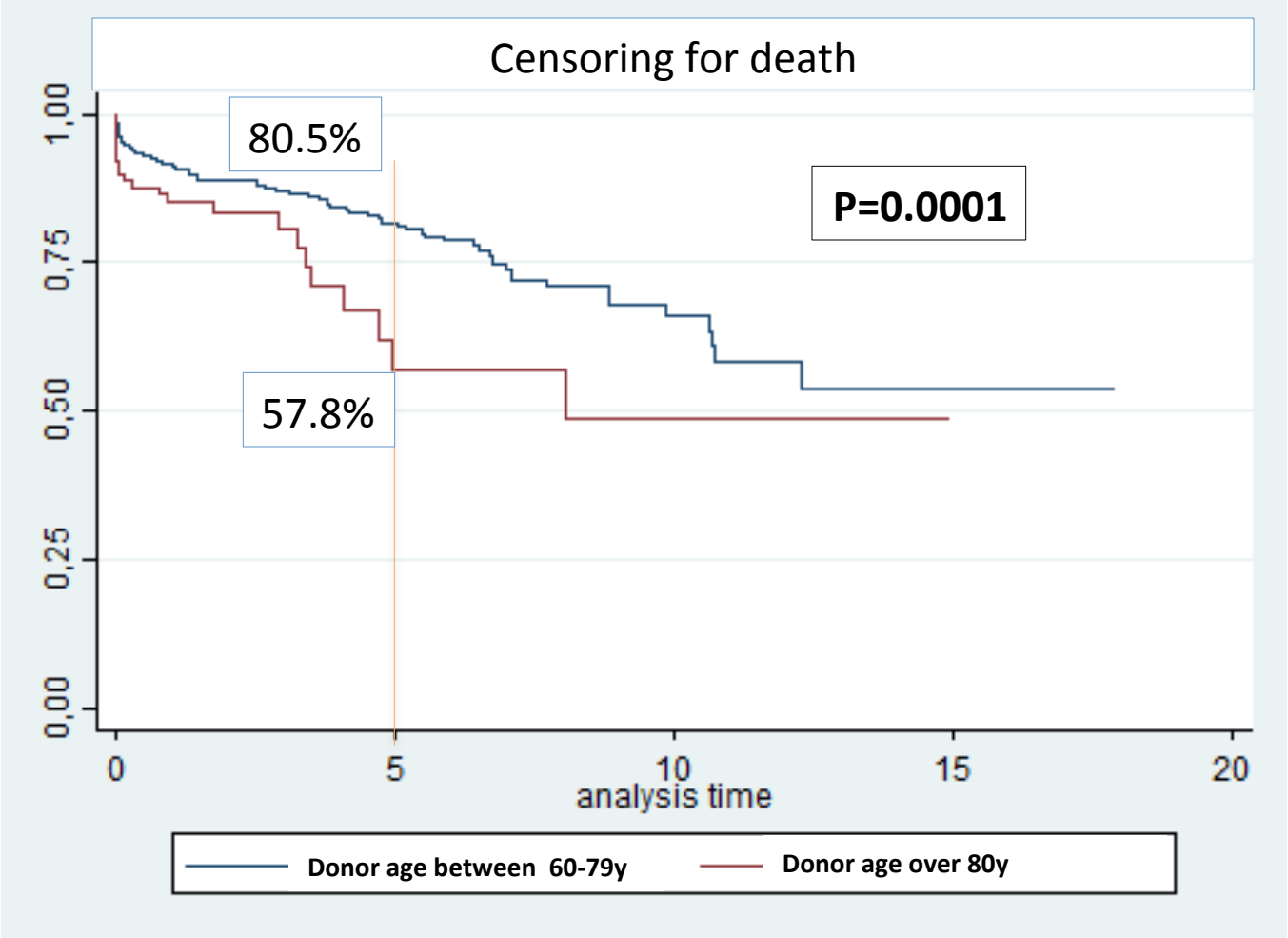
But… Is the same true for kidneys from extremely old (80+) donors?



Long-term outcome of renal transplantation from octogenarian donors: A multicenter controlled study.
Ruggenenti Am J Transplant. 2017 Aug 9.

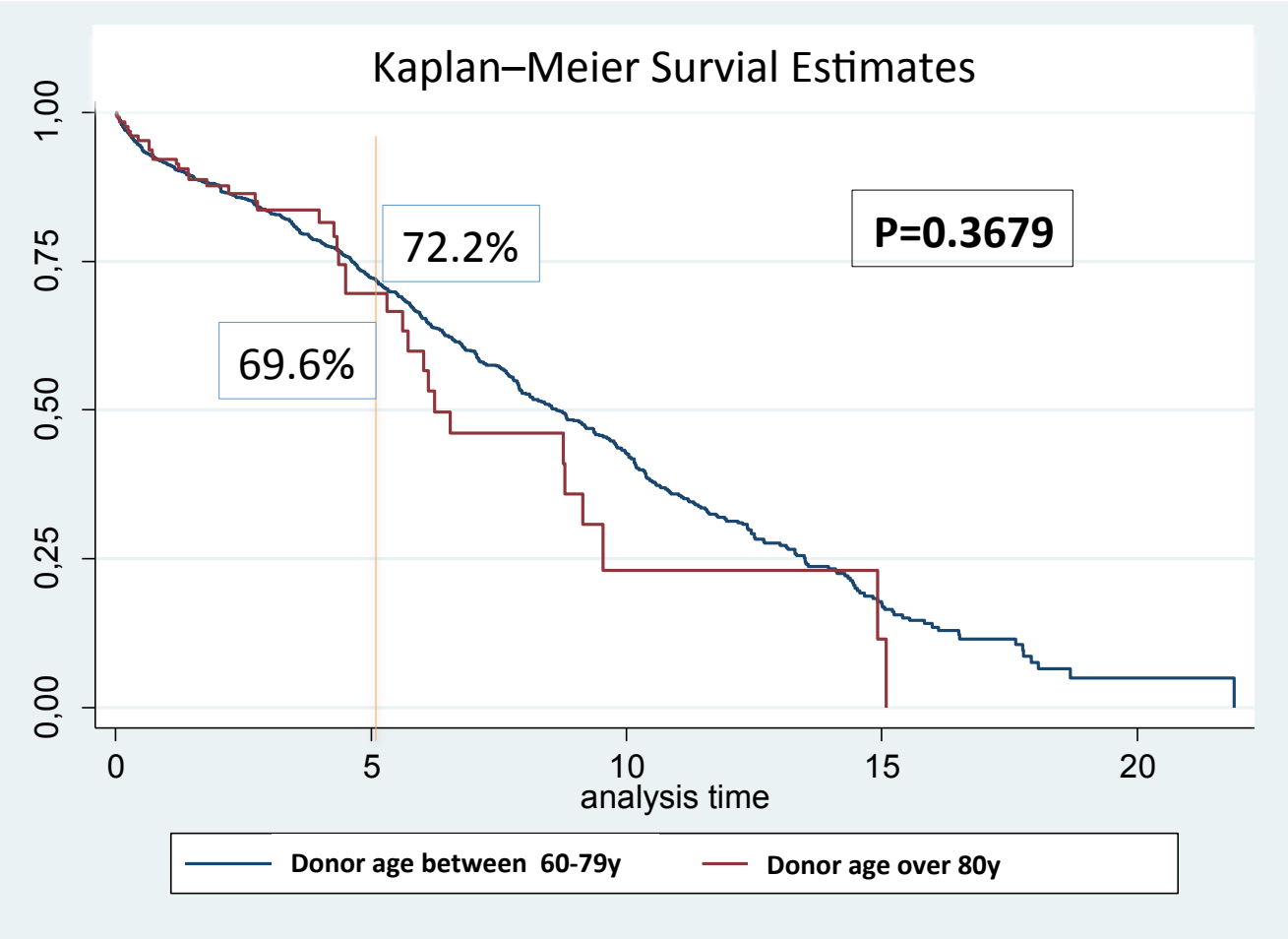
Survival comparison among kidney transplant recipients from deceased donors over 80 years and patients on dialysis awaiting transplantation
Emma Arcos [1]Registre de Malalts Renals de Catalunya, OCATT, Servei de Nefrologia, H. del Mar,

Graft survival according to donor age:



Acute transplant rejection has been removed (n=28)

Patient survival according to donor age after transplantation:



Conclusions

- **KT from a donor over 80y is associated with a 51% reduction in mortality, when compared with those remaining on dialysis**